Horizon 2020

Call: H2020-INFRADEV-2016-2017

(Development and long-term sustainability of new pan-European research infrastructures)

Topic: INFRADEV-02-2016

Type of action: CSA

(Coordination and support action)

Proposal number: 739530

Proposal acronym: ACTRIS PPP

Deadline Id: H2020-INFRADEV-2016-2

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How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the previous steps in the submission wizard.

Proposal ID **739530** *Acronym* **ACTRIS PPP**

1 - General information

Topic	INFRADEV-02-2016
Call Identifier	H2020-INFRADEV-2016-2017
Type of Action	CSA
Deadline Id	H2020-INFRADEV-2016-2

Acronym: ACTRIS PPP

Proposal title*: ACTRIS PPP - Aerosols, Clouds and Trace gases Preparatory Phase Project

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months: *36*

Fixed keyword 1: *Knowledge infrastructure* Add

Free keywords: *research infrastructure, climate change, air pollution, services to users, innovation, establishment of legal entity, governance, financial plans, central and national facilities, strategic planning*

Abstract

The Research Infrastructure (RI) ACTRIS – Aerosols, Clouds and Trace Gases - is the pan-European RI that consolidates activities amongst European partners for observations of aerosols, clouds, and trace gases and for understanding of the related atmospheric processes, to provide RI services to wide user groups.

ACTRIS is composed of 8 connected elements: distributed National Facilities (observation platforms and exploratory platforms) both in Europe and globally, and 7 Central Facilities (Head Office, Data Centre and 5 Calibration Centres). ACTRIS provides access to its facilities, open-access data, research support, instrument calibration and development, and training to various user groups. By providing data and access ACTRIS enhances science, but it also generates and disseminates knowledge, boosts technological development, and creates human capital and jobs for the benefit of the society. ACTRIS will positively impact on e.g. human health, climate resilience, and protection from environmental hazards and reduction of air pollution.

ACTRIS has been selected to the ESFRI roadmap in 2016 as mature enough to be implemented within the next ten years. ACTRIS Preparatory Phase Project (PPP) will have a significant role in enabling the transition from a project-based network of research facilities to a centrally coordinated integrated pan-European RI. ACTRIS PPP brings together a wide community of research performing organizations, research funding organizations and ministries needed to take the decisions and actions to move forward in the implementation of the ACTRIS. The main objectives of ACTRIS PPP are to develop the organizational, operational and strategic frameworks of the RI. The work includes legal, governance, financial, technical, strategic, and administrative aspects carried out in 9 work packages. The main outcomes of PPP are signature-ready documents for establishment of a legal entity with well-defined operations and a sound business plan.

Remaining characters 11

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under the 7th Framework Programme, Horizon 2020 or any other EU programme(s)? ○ Yes ◉ No

Proposal ID **739530** *Acronym* **ACTRIS PPP**

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	☒
2) The information contained in this proposal is correct and complete.	☒
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	☒

4) The coordinator confirms:

- to have carried out the self-check of the financial capacity of the organisation on http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was "weak" or "insufficient", the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	○
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	◉
- as sole participant in the proposal is exempt from the financial capacity check.	○

5) The coordinator hereby declares that each applicant has confirmed:

- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	☒
- they have the financial and operational capacity to carry out the proposed action.	☒

The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him/her and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection

Your reply to the grant application will involve the recording and processing of personal data (such as your name, address and CV), which will be processed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the processing of your personal data are available on the privacy statement. Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Warning System (EWS) only or both in the EWS and Central Exclusion Database (CED) by the Accounting Officer of the Commission, should you be in one of the situations mentioned in:
-the Commission Decision 2008/969 of 16.12.2008 on the Early Warning System (for more information see the Privacy Statement), or
-the Commission Regulation 2008/1302 of 17.12.2008 on the Central Exclusion Database (for more information see the Privacy Statement) .

Proposal ID **739530** *Acronym* **ACTRIS PPP**

List of participants

#	Participant Legal Name	Country
1	ILMATIETEEN LAITOS	Finland
2	HELSINGIN YLIOPISTO	Finland
3	CONSIGLIO NAZIONALE DELLE RICERCHE	Italy
4	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	France
5	NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT FOR OPTOELECTRONICS	Romania
6	CESKY HYDROMETEOROLOGICKY USTAV	Czech Republic
7	LEIBNIZ INSTITUT FUER TROPOSPHAERENFORSCHUNG e.V.	Germany
8	KARLSRUHER INSTITUT FUER TECHNOLOGIE	Germany
9	NATIONAL OBSERVATORY OF ATHENS	Greece
10	NORSK INSTITUTT FOR LUFTFORSKNING	Norway
11	UNIVERSITAT POLITECNICA DE CATALUNYA	Spain
12	AGENCIA ESTATAL CONSEJO SUPERIOR DEINVESTIGACIONES CIENTIFICAS	Spain
13	UNIVERSIDAD DE VALLADOLID	Spain
14	THE UNIVERSITY OF MANCHESTER	United Kingdom
15	NATURAL ENVIRONMENT RESEARCH COUNCIL	United Kingdom
16	SCIENCE AND TECHNOLOGY FACILITIES COUNCIL	United Kingdom
17	KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT-KNMI	Netherlands
18	PAUL SCHERRER INSTITUT	Switzerland
19	EIDGENOSSISCHE MATERIALPRUFUNGS- UND FORSCHUNGSANSTALT	Switzerland
20	THE CYPRUS INSTITUTE LIMITED	Cyprus
21	Instytut Geofizyki Polskiej Akademii Nauk	Poland

Proposal ID **739530** *Acronym* **ACTRIS PPP**

#	Participant Legal Name	Country
22	LUNDS UNIVERSITET	Sweden
23	INSTITUT ROYAL D'AERONOMIE SPATIALE DE BELGIQUE	Belgium
24	NATIONAL UNIVERSITY OF IRELAND, GALWAY	Ireland
25	EESTI MAAULIKOOL	Estonia
26	AARHUS UNIVERSITET	Denmark
27	INSTITUTE OF NUCLEAR RESEARCH AND NUCLEAR ENERGY - BULGARIAN ACADEMY OF SCIENCES	Bulgaria
28	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Belgium

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **FMI**

2 - Administrative data of participating organisations

PIC	***Legal name***
999591306	*ILMATIETEEN LAITOS*

Short name: FMI

Address of the organisation

Street Erik Palmenin aukio 1

Town HELSINKI

Postcode 00560

Country Finland

Webpage www.fmi.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... unknown
International organisation of European interest ..... unknown
Secondary or Higher education establishment ..... unknown
Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **FMI**

Department(s) carrying out the proposed work

Department 1

Department name: Research and Development ☐ not applicable

☒ Same as organisation address

Street: Erik Palmenin aukio 1

Town: HELSINKI

Postcode: 00560

Country: Finland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **FMI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name **Sanna** Last name **SORVARI**

E-Mail **sanna.sorvari@fmi.fi**

Position in org.: Research manager

Department: Research and development ☐ Same as organisation

☒ Same as organisation address

Street: Erik Palmenin aukio 1

Town: HELSINKI Post code: 00560

Country: Finland

Website: www.fmi.fi

Phone 1: +358 50 415 4729 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Anna	Salonen	anna.salonen@fmi.fi	+358504677733
Niku	Kivekäs	niku.kivekas@fmi.fi	+358505728435
Terhi	Kontkanen	terhi.kontkanen@fmi.fi	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UHEL**

PIC	***Legal name***
999994535	*HELSINGIN YLIOPISTO*

Short name: UHEL

Address of the organisation

Street YLIOPISTONKATU 4

Town HELSINGIN YLIOPISTO

Postcode 00014

Country Finland

Webpage www.helsinki.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2007 - yes

SME self-assessment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UHEL**

Department(s) carrying out the proposed work

Department 1

Department name: DEPARTMENT OF PHYSICS ☐ not applicable

☐ Same as organisation address

Street: GUSTAF HÄLLSTRÖMIN KATU 2 A

Town: HELSINGIN YLIOPISTO

Postcode: 00014

Country: Finland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UHEL**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Markku** Last name: **Kulmala**

E-Mail: **markku.kulmala@helsinki.fi**

Position in org.: Head of the Division of Atmospheric Sciences

Department: Department of Physics ☐ Same as organisation

☐ Same as organisation address

Street: GUSTAF HÄLLSTRÖMIN KATU 2 A

Town: HELSINGIN YLIOPISTO Post code: 00014

Country: Finland

Website: http://www.physics.helsinki.fi/tutkimus/atm/english/

Phone 1: +358405962311 Phone 2: +xxx xxxxxxxxx Fax: +358919150717

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Silja	Häme	silja.hame@helsinki.fi	+358504489087
Tuukka	Petäjä	tuukka.petaja@helsinki.fi	+358504155278
Satu	Väisänen	satu.vaisanen@helsinki.fi	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNR**

PIC	***Legal name***
999979500	*CONSIGLIO NAZIONALE DELLE RICERCHE*

Short name: CNR

Address of the organisation

Street PIAZZALE ALDO MORO 7

Town ROMA

Postcode 00185

Country Italy

Webpage www.cnr.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... yes
Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no
SME self-assessment ..... unknown
SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNR**

Department(s) carrying out the proposed work

Department 1

Department name: Istituto di Metodologie per l'Analisi Ambientale ☐ not applicable

☐ Same as organisation address

Street: Contrada S. Loja

Town: Tito

Postcode: 85050

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNR**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Gelsomina** Last name: **Pappalardo**

E-Mail: **gelsomina.pappalardo@imaa.cnr.it**

Position in org.: Senior Research Scientist

Department: Istituto di Metodologie per l'Analisi Ambientale ☐ Same as organisation

☐ Same as organisation address

Street: Contrada S. Loja

Town: Tito Post code: 85050

Country: Italy

Website: www.imaa.cnr.it

Phone 1: +390971427265 Phone 2: +393204349366 Fax: +390971427271

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Carmela	Cornacchia	carmela.cornacchia@imaa.cnr.it	+393386582366

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNRS**

PIC	***Legal name***
999997930	*CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS*

Short name: CNRS

Address of the organisation

Street RUE MICHEL ANGE 3

Town PARIS

Postcode 75794

Country France

Webpage www.cnrs.fr

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2013 - no

SME self-assessment ..... unknown

SME validation sme ..... 2013 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Department(s) carrying out the proposed work

Department 1

Department name: Laboratoire de glaciologie et de géophysique de l'environnement ☐ not applicable

☐ Same as organisation address

Street: 54 rue Molière - BP 96

Town: ST MARTIN D HERES CEDEX

Postcode: 38402

Country: France

Department 2

Department name: Laboratoire de météorologie physique ☐ not applicable

☐ Same as organisation address

Street: Bât. Physique 5 - 4 Avenue Blaise Pascal

Town: AUBIERE CEDEX

Postcode: 63178

Country: France

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNRS**

Department 3

Department name: Institut national des sciences de l'univers du CNRS ☐ not applicable

☐ Same as organisation address

Street: bat. C 3 rue Michel-Ange

Town: PARIS CEDEX 16

Postcode: 75794

Country: France

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CNRS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Paolo** Last name: **Laj**

E-Mail: **laj@lgge.obs.ujf-grenoble.fr**

Position in org.: Physicist

Department: Laboratoire de glaciologie et de géophysique de l'environnement ☐ Same as organisation

☐ Same as organisation address

Street: 54 rue Molière - BP 96

Town: ST MARTIN D HERES CEDEX Post code: 38402

Country: France

Website: http://lgge.osug.fr/

Phone 1: +33476824235 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Sabine	PHILIPPIN	s.philippin@opgc.univ-bpclermont.fr	
CNRS SPV	EUROPE-DRALPES	a.spv-europe@dr11.cnrs.fr	+33476881006

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **INOE**

PIC	***Legal name***
999758243	*NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT FOR OPTOELECTRONICS*

Short name: INOE

Address of the organisation

Street ATOMISTILOR STREET 409

Town MAGURELE

Postcode RO77125

Country Romania

Webpage http://inoe.inoe.ro

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **INOE**

Department(s) carrying out the proposed work

Department 1

Department name: Remote Sensing ☐ not applicable

☒ Same as organisation address

Street: ATOMISTILOR STREET 409

Town: MAGURELE

Postcode: RO77125

Country: Romania

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **INOE**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Doina** Last name: **Nicolae**

E-Mail: **nnicol@inoe.ro**

Position in org.: Head of Department

Department: Remote Sensing ☐ Same as organisation

☒ Same as organisation address

Street: ATOMISTILOR STREET 409

Town: MAGURELE Post code: RO77125

Country: Romania

Website: http://environment.inoe.ro/

Phone 1: 0040314053303 Phone 2: 0040214574522 Fax: 0040214574522

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Jeni	Vasilescu	jeni@inoe.ro	0040314053303

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CESKY HYDROMETEOROLOGICKY USTAV**

PIC	***Legal name***
999507304	*CESKY HYDROMETEOROLOGICKY USTAV*

Short name: CESKY HYDROMETEOROLOGICKY USTAV

Address of the organisation

Street NA SABATCE 17

Town PRAHA 4

Postcode 14306

Country Czech Republic

Webpage www.chmi.cz

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2013 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: L - Real estate activities

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CESKY HYDROMETEOROLOGICKY USTAV**

Department(s) carrying out the proposed work

Department 1

Department name: Air Quality Division ☐ not applicable

☒ Same as organisation address

Street: NA SABATCE 17

Town: PRAHA 4

Postcode: 14306

Country: Czech Republic

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CESKY HYDROMETEOROLOGICKY USTAV**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Milan** Last name: **Vana**

E-Mail: **milan.vana@chmi.cz**

Position in org.: Head of Kosetice Observatory

Department: Air Quality Division ☐ Same as organisation

☒ Same as organisation address

Street: NA SABATCE 17

Town: PRAHA 4 Post code: 14306

Country: Czech Republic

Website: www.chmi.cz

Phone 1: +420565498015 Phone 2: +420725895574 Fax: +xxx xxxxxxxxx

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Iva	Knotková	iva.knotkova@chmi.cz	
Eva	Malcová	eva.malcova@chmi.cz	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **TROPOS**

PIC	***Legal name***
999450850	*LEIBNIZ INSTITUT FUER TROPOSPHAERENFORSCHUNG e.V.*

Short name: TROPOS

Address of the organisation

Street Permoserstrasse 15

Town LEIPZIG

Postcode 04318

Country Germany

Webpage www.tropos.de

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2007 - no

SME self-assessment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: - - Not applicable

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **TROPOS**

Department(s) carrying out the proposed work

Department 1

Department name: Remote Sensing of Atmospheric Processes ☐ not applicable

☒ Same as organisation address

Street: Permoserstrasse 15

Town: LEIPZIG

Postcode: 04318

Country: Germany

Department 2

Department name: Experimental Aerosol and Cloud Microphysics ☐ not applicable

☒ Same as organisation address

Street: Permoserstrasse 15

Town: LEIPZIG

Postcode: 04318

Country: Germany

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **TROPOS**

Department 3

Department name: Atmospheric Chemistry ☐ not applicable

☒ Same as organisation address

Street: Permoserstrasse 15

Town: LEIPZIG

Postcode: 04318

Country: Germany

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **TROPOS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Ulla** Last name: **Wandinger**

E-Mail: **ulla.wandinger@tropos.de**

Position in org.: Senior Researcher

Department: Remote Sensing of Atmospheric Processes ☐ Same as organisation

☒ Same as organisation address

Street: Permoserstrasse 15

Town: LEIPZIG Post code: 04318

Country: Germany

Website: www.tropos.de

Phone 1: +4934127177082 Phone 2: +xxx xxxxxxxxx Fax: +49341271799708

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Markus	Hermann	markus.hermann@tropos.de	+4934127177126
Alfred	Wiedensohler	alfred.wiedensohler@tropos.de	+4934127177062
Ariane	Pohlenz	ariane.pohlenz@tropos.de	+4934127177183

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KIT**

PIC	***Legal name***
990797674	*KARLSRUHER INSTITUT FUER TECHNOLOGIE*

Short name: KIT

Address of the organisation

Street KAISERSTRASSE 12

Town KARLSRUHE

Postcode 76131

Country Germany

Webpage www.kit.edu

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2011 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Department(s) carrying out the proposed work

Department 1

Department name: Helmholtz Programme Atmosphere and Climate (ATMO) ☐ not applicable

☐ Same as organisation address

Street: Hermann-von-Helmholtz-Platz 1

Town: Eggenstein-Leopoldshafen

Postcode: 76344

Country: Germany

Department 2

Department name: Institute for Meteorology and Climate Research (IMK) ☐ not applicable

☐ Same as organisation address

Street: Hermann-von-Helmholtz-Platz 1

Town: Eggenstein-Leopoldshafen

Postcode: 76344

Country: Germany

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KIT**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name **Peter** Last name **Bremer**

E-Mail **peter.bremer@kit.edu**

Position in org.: Programme manager

Department: KARLSRUHER INSTITUT FUER TECHNOLOGIE ☒ Same as organisation

☒ Same as organisation address

Street: KAISERSTRASSE 12

Town: KARLSRUHE Post code: 76131

Country: Germany

Website:

Phone 1: +4972160828595 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Kristine	Bentz	eu@for.kit.edu	+4972160845192

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NOA**

PIC	***Legal name***
999653677	*NATIONAL OBSERVATORY OF ATHENS*

Short name: NOA

Address of the organisation

Street LOFOS NYMFON

Town ATHINA

Postcode 11810

Country Greece

Webpage www.noa.gr

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no

SME self-assessment ..... unknown

SME validation sme ..... 2012 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: - - Not applicable

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NOA**

Department(s) carrying out the proposed work

Department 1

Department name: Institute for Environmental Research & Sustainable Development ☐ not applicable

☐ Same as organisation address

Street: I. Metaxa & Vas. Pavlou

Town: Palea Penteli

Postcode: GR-15236

Country: Greece

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NOA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Nikos** Last name: **Mihalopoulos**

E-Mail: **mihalo@chemistry.uoc.gr**

Position in org.: Director

Department: Institute for Environmental Research & Sustainable Development ☐ Same as organisation

☐ Same as organisation address

Street: I. Metaxa & Vas. Pavlou

Town: Palea Penteli Post code: GR-15236

Country: Greece

Website: www.noa.gr

Phone 1: +302108109121 Phone 2: +xxx xxxxxxxxx Fax: +302108103236

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Vassilis	Amoiridis	vamoir@noa.gr	+302108109116
Panagiotis	Poulopoulos	poulopoulos@noa.gr	+302103256225

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NORSK INSTITUTT FOR LUFTFORSKNING**

PIC	***Legal name***
999654162	*NORSK INSTITUTT FOR LUFTFORSKNING*

Short name: NORSK INSTITUTT FOR LUFTFORSKNING

Address of the organisation

Street Instituttveien 18

Town KJELLER

Postcode 2027

Country Norway

Webpage www.nilu.no

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NORSK INSTITUTT FOR LUFTFORSKNING**

Department(s) carrying out the proposed work

Department 1

Department name: Atmospheric and Climate Research Department (ATMOS) ☐ not applicable

☒ Same as organisation address

Street: Instituttveien 18

Town: KJELLER

Postcode: 2027

Country: Norway

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NORSK INSTITUTT FOR LUFTFORSKNING**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Cathrine** Last name: **Lund Myhre**

E-Mail: **clm@nilu.no**

Position in org.: Senior Scientist

Department: Atmospheric and Climate Research Department (ATMOS) ☐ Same as organisation

☒ Same as organisation address

Street: Instituttveien 18

Town: KJELLER Post code: 2027

Country: Norway

Website: www.nilu.no

Phone 1: +4763898042 Phone 2: +4763898000 Fax: +4763898050

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Eva	Beate Andresen	eba@nilu.no	+4763898020
Heidi	Fjeldstad	hfj@nilu.no	+4763898101
Berit	Modalen	bmo@nilu.no	+4763898071

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UPC**

PIC	***Legal name***
999976202	*UNIVERSITAT POLITECNICA DE CATALUNYA*

Short name: UPC

Address of the organisation

Street CALLE JORDI GIRONA 31

Town BARCELONA

Postcode 08034

Country Spain

Webpage www.upc.edu

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2013 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UPC**

Department(s) carrying out the proposed work

Department 1

Department name: Signal Theory and Communications Department ☐ not applicable

☐ Same as organisation address

Street: JORDI GIRONA,1.CAMPUS NORD,BUILDING D4

Town: BARCELONA

Postcode: 08034

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UPC**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Adolfo** Last name: **Comerón**

E-Mail: **comeron@tsc.upc.edu**

Position in org.: SENIOR RESEARCHER

Department: Signal Theory and Communications Department ☐ Same as organisation

☐ Same as organisation address

Street: JORDI GIRONA,1.CAMPUS NORD,BUILDING D4

Town: BARCELONA Post code: 08034

Country: Spain

Website:

Phone 1: 934017198 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Irene	Jorge	irene.jorge@upc.edu	
Mercedes	Torrellas	cttinfo.europeus@upc.edu	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CSIC**

PIC	***Legal name***
999991722	*AGENCIA ESTATAL CONSEJO SUPERIOR DEINVESTIGACIONES CIENTIFICAS*

Short name: CSIC

Address of the organisation

Street CALLE SERRANO 117

Town MADRID

Postcode 28006

Country Spain

Webpage http://www.csic.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CSIC**

Department(s) carrying out the proposed work

Department 1

Department name: Institute of Environmental Assessment and Water Research ☐ not applicable

☐ Same as organisation address

Street: C/ Jordi Girona, 18-26

Town: Barcelona

Postcode: 08034

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CSIC**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Andres** Last name: **Alastuey**

E-Mail: **andres.alastuey@idaea.csic.es**

Position in org.: Research Professor

Department: Institute of Environmental Assessment and Water Research ☐ Same as organisation

☐ Same as organisation address

Street: C/ Jordi Girona, 18-26

Town: Barcelona Post code: 08034

Country: Spain

Website:

Phone 1: +34 934006100 Phone 2: +34 934006124 Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Marco	Pandolfi	marco.pandolfi@idaea.csic.es	
Joan R.	Ibañez	gerencia.cid@csic.es	
Monica	Martin Lanuza	monica.lanuza@orgc.csic.es	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UVA**

PIC	***Legal name***
999862809	*UNIVERSIDAD DE VALLADOLID*

Short name: UVA

Address of the organisation

Street PLAZA SANTA CRUZ 8 PALACIO DE SANTA C

Town VALLADOLID

Postcode 47002

Country Spain

Webpage www.uva.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... yes

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 8530 - Higher education

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UVA**

Department(s) carrying out the proposed work

Department 1

Department name: Grupo de Óptica Atmosférica (GOA) ☐ not applicable

☐ Same as organisation address

Street: Paseo de Belén 7, Facultad de Ciencias

Town: Valladolid

Postcode: 47011

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UVA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Carlos** Last name: **Toledano**

E-Mail: **toledano@goa.uva.es**

Position in org.: Senior researcher

Department: Grupo de Óptica Atmosférica (GOA) [ ] Same as organisation

[ ] Same as organisation address

Street: Paseo de Belen 7, Facultad de Ciencias

Town: Valladolid Post code: 47011

Country: Spain

Website: http://goa.uva.es

Phone 1: +34 983423608 Phone 2: +34 983423270 Fax: +34 983423013

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Victoria	Cachorro	chiqui@goa.uva.es	+34 983423270
Yolanda	Calvo	innovacion@funge.uva.es	+34 983186420

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UNIVERSITY OF MANCHESTER**

PIC	***Legal name***
999903840	*THE UNIVERSITY OF MANCHESTER*

Short name: UNIVERSITY OF MANCHESTER

Address of the organisation

Street OXFORD ROAD UNIVERSITY OF MANCHEST

Town MANCHESTER

Postcode M13 9PL

Country United Kingdom

Webpage www.manchester.ac.uk

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... 2015 - no

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **UNIVERSITY OF MANCHESTER**

Department(s) carrying out the proposed work

Department 1

Department name: School of Earth, Atmospheric and Environmental Sciences ☐ not applicable

☒ Same as organisation address

Street: OXFORD ROAD UNIVERSITY OF MANCHESTER OFF

Town: MANCHESTER

Postcode: M13 9PL

Country: United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **UNIVERSITY OF MANCHESTER**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Geraint** Last name: **Vaughan**

E-Mail: **geraint.vaughan@manchester.ac.uk**

Position in org.: Professor of Atmospheric Sciences

Department: School of Earth, Atmospheric and Environmental Sciences ☐ Same as organisation

☒ Same as organisation address

Street: OXFORD ROAD UNIVERSITY OF MANCHESTER OFFICE OF DIRECTOR

Town: MANCHESTER Post code: M13 9PL

Country: United Kingdom

Website: http://www.manchester.ac.uk/research/Geraint.vaughan/

Phone 1: 44 161 306 3931 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Sara	Lockett	sara.lockett@manchester.ac.uk	
Andrew	Railton	andrew.railton@manchester.ac.uk	
Liz	Fay	liz.fay@manchester.ac.uk	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NERC**

PIC	***Legal name***
999989200	*NATURAL ENVIRONMENT RESEARCH COUNCIL*

Short name: NERC

Address of the organisation

Street Polaris House, North Star Avenue

Town SWINDON WILTSHIRE

Postcode SN2 1EU

Country United Kingdom

Webpage http://www.nerc.ac.uk

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... 2015 - no

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NERC**

Department(s) carrying out the proposed work

Department 1

Department name: NERC Centre for Ecology and Hydrology ☐ not applicable

☒ Same as organisation address

Street: Polaris House, North Star Avenue

Town: SWINDON WILTSHIRE

Postcode: SN2 1EU

Country: United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NERC**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Christine** Last name: **Braban**

E-Mail: **chri2@ceh.ac.uk**

Position in org.: Atmospheric Composition Group Leader

Department: Biosphere Atmosphere Interactions, CEH Edinburgh ☐ Same as organisation

☐ Same as organisation address

Street: Bush Estate

Town: Penicuik Post code: EH260QB

Country: United Kingdom

Website: http://www.ceh.ac.uk/staff/christine-braban

Phone 1: 00441314458482 Phone 2: 00447795334555 Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Gary	Fitchie	gvfit@ceh.ac.uk	00441314458517

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **SCIENCE AND TECHNOLOGY FACILITIES**

PIC	***Legal name***
999980179	*SCIENCE AND TECHNOLOGY FACILITIES COUNCIL*

Short name: SCIENCE AND TECHNOLOGY FACILITIES COUNCIL

Address of the organisation

Street Polaris House North Star Avenue

Town SWINDON

Postcode SN2 1SZ

Country United Kingdom

Webpage www.scitech.ac.uk

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2006 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **SCIENCE AND TECHNOLOGY FACILITIES**

Department(s) carrying out the proposed work

Department 1

Department name: RAL Space ☐ not applicable

☐ Same as organisation address

Street: Rutherford Appleton Laboratory

Town: Harwell Campus, Didcot

Postcode: OX11 0QX

Country: United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **SCIENCE AND TECHNOLOGY FACILITIES**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: (•) Male ( ) Female

First name: **Christopher** | Last name: **WALDEN**

E-Mail: **chris.walden@stfc.ac.uk**

Position in org.: Head of Chilbolton Facility for Atmospheric and Radio Research

Department: RAL Space | [ ] Same as organisation

[ ] Same as organisation address

Street: Rutherford Appleton Laboratory

Town: Harwell Campus, Didcot | Post code: OX11 0QX

Country: United Kingdom

Website: http://www.ralspace.stfc.ac.uk/RALSpace/

Phone 1: +441235445601 | Phone 2: +xxx xxxxxxxxx | Fax: +441235446140

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Branwen	Hide	branwen.hide@stfc.ac.uk	+441235445563

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KNMI**

PIC	***Legal name***
999518944	*KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT-KNMI*

Short name: KNMI

Address of the organisation

Street UTRECHTSEWEG 297

Town DE BILT

Postcode 3731 GA

Country Netherlands

Webpage www.knmi.nl

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2007 - no

SME self-assessment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: L - Real estate activities

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KNMI**

Department(s) carrying out the proposed work

Department 1

Department name: Research and Development Observations and Data Technologu ☐ not applicable

☒ Same as organisation address

Street: UTRECHTSEWEG 297

Town: DE BILT

Postcode: 3731 GA

Country: Netherlands

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KNMI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name: **Arnoud** Last name: **Apituley**

E-Mail: **arnoud.apituley@knmi.nl**

Position in org.: Senior Scientist

Department: KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT-KNMI ☒ Same as organisation

☒ Same as organisation address

Street: UTRECHTSEWEG 297

Town: DE BILT Post code: 3731 GA

Country: Netherlands

Website: www.knmi.nl

Phone 1: +31302206418 Phone 2: +313022069111 Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Herman	Russchenberg	h.w.j.russchenberg@tudelft.nl	+31152786292
Annemarie	Koot	annemarie.koot@knmi.nl	+31302206746
Lizzy	Repelius	lizzy.repelius@knmi.nl	+31302206746

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **PSI**

PIC	***Legal name***
999994923	*PAUL SCHERRER INSTITUT*

Short name: PSI

Address of the organisation

Street .

Town VILLIGEN PSI

Postcode 5232

Country Switzerland

Webpage www.psi.ch

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... 2015 - no

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **PSI**

Department(s) carrying out the proposed work

Department 1

Department name: Atmospheric Chemistry ☐ not applicable

☒ Same as organisation address

Street: .

Town: VILLIGEN PSI

Postcode: 5232

Country: Switzerland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **PSI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Urs** Last name: **Baltensperger**

E-Mail: **urs.baltensperger@psi.ch**

Position in org.: Laboratory Head

Department: Atmospheric Chemistry ☐ Same as organisation

☒ Same as organisation address

Street: .

Town: VILLIGEN PSI Post code: 5232

Country: Switzerland

Website: www.psi.ch/lac

Phone 1: +41563102408 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Irene	Walthert	irene.walthert@psi.ch	+41563102664

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **EMPA**

PIC	***Legal name***
999907138	*EIDGENOSSISCHE MATERIALPRUFUNGS- UND FORSCHUNGSANSTALT*

Short name: EMPA

Address of the organisation

Street UEBERLANDSTRASSE 129

Town DUBENDORF

Postcode 8600

Country Switzerland

Webpage www.empa.ch

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **EMPA**

Department(s) carrying out the proposed work

Department 1

Department name: Air Pollution/Environmental Technology ☐ not applicable

☒ Same as organisation address

Street: UEBERLANDSTRASSE 129

Town: DUBENDORF

Postcode: 8600

Country: Switzerland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **EMPA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Stefan** Last name: **Reimann**

E-Mail: **stefan.reimann@empa.ch**

Position in org.: Senior Scientits

Department: Air Pollution/Environmental Technology ☐ Same as organisation

☒ Same as organisation address

Street: UEBERLANDSTRASSE 129

Town: DUBENDORF Post code: 8600

Country: Switzerland

Website: https://www.empa.ch/web/s503/overview

Phone 1: +41 587655511 Phone 2: +41 587654638 Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Georg	SPESCHA	georg.spescha@empa.ch	+41 587654641
Alexander	SUTTER	alexander.sutter@empa.ch	+41 587654555
Heidi	LEUTWYLER	heidi.leutwyler@empa.ch	+41 58 765 4591

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CYI**

PIC	***Legal name***
965934440	*THE CYPRUS INSTITUTE LIMITED*

Short name: CYI

Address of the organisation

Street CONSTANTINOU KAVAFI 20

Town LEFKOSIA

Postcode 2121

Country Cyprus

Webpage www.cyi.ac.cy

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CYI**

Department(s) carrying out the proposed work

Department 1

Department name: Energy, Environment and Water Research Center (EEWRC) ☐ not applicable

☒ Same as organisation address

Street: CONSTANTINOU KAVAFI 20

Town: LEFKOSIA

Postcode: 2121

Country: Cyprus

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **CYI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Jean** Last name: **Sciare**

E-Mail: **j.sciare@cyi.ac.cy**

Position in org.: Director of EEWRC

Department: Energy, Environment and Water Research Center (EEWRC) ☐ Same as organisation

☒ Same as organisation address

Street: CONSTANTINOU KAVAFI 20

Town: LEFKOSIA Post code: 2121

Country: Cyprus

Website: www.cyi.ac.cy

Phone 1: +35722208601 Phone 2: +35722208613 Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Marios	Demetriades	sponsored.research@cyi.ac.cy	+35722208613

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **IGF PAS**

PIC	***Legal name***
996625337	*Instytut Geofizyki Polskiej Akademii Nauk*

Short name: IGF PAS

Address of the organisation

Street Ksiecia Janusza 64

Town Warsaw

Postcode 01-452

Country Poland

Webpage www.igf.edu.pl

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... yes
Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2010 - no
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **IGF PAS**

Department(s) carrying out the proposed work

Department 1

Department name: Atmospheric Physics ☐ not applicable

☒ Same as organisation address

Street: Ksiecia Janusza 64

Town: Warsaw

Postcode: 01-452

Country: Poland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **IGF PAS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Aleksander** Last name: **Pietruczuk**

E-Mail: **alek@igf.edu.pl**

Position in org.: associate professor

Department: Physics of the Atmosphere ☐ Same as organisation

☒ Same as organisation address

Street: Ksiecia Janusza 64

Town: Warsaw Post code: 01-452

Country: Poland

Website:

Phone 1: +48226915877 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Joanna	Danilczuk-Zembrzuska	jdanilczukzembrzuska@igf.edu.pl	+48226915825

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **LUNDS UNIVERSITET**

PIC	***Legal name***
999901318	*LUNDS UNIVERSITET*

Short name: LUNDS UNIVERSITET

Address of the organisation

Street Paradisgatan 5c

Town LUND

Postcode 22100

Country Sweden

Webpage www.lu.se

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **LUNDS UNIVERSITET**

Department(s) carrying out the proposed work

Department 1

Department name: Division of Nuclear Physics, Department of Physics ☐ not applicable

☒ Same as organisation address

Street: Paradisgatan 5c

Town: LUND

Postcode: 22100

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **LUNDS UNIVERSITET**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Erik** Last name: **Swietlicki**

E-Mail: **erik.swietlicki@nuclear.lu.se**

Position in org.: Professor

Department: LUNDS UNIVERSITET ☒ Same as organisation

☒ Same as organisation address

Street: Paradisgatan 5c

Town: LUND Post code: 22100

Country: Sweden

Website: www.lu.se

Phone 1: +46-46-2229680 Phone 2: +46-70-9924512 Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Adam	Kristensson	adam.kristensson@nuclear.lu.se	+46-46-2227645
Birgitta	Svenningsson	birgitta.svenningsson@nuclear.lu.se	+46-46-2227639
Yulia	Lindholm	yulia.lindholm@nuclear.lu.se	+46-46-2227631

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KONINKLIJK BELGISCH INSTITUUT VOOR**

PIC	***Legal name***
999642134	*INSTITUT ROYAL D'AERONOMIE SPATIALE DE BELGIQUE*

Short name: KONINKLIJK BELGISCH INSTITUUT VOOR RUIMTE-AERONOMIE ROYALBELGIAN INSTITUTE FOR SPACE AERONO

Street AVENUE CIRCULAIRE 3

Town BRUXELLES

Postcode 1180

Country Belgium

Webpage www.aeronomie.be

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... yes
Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **KONINKLIJK BELGISCH INSTITUUT VOOR**

Department(s) carrying out the proposed work

Department 1

Department name: Sources and sinks of atmospheric constituents ☐ not applicable

☒ Same as organisation address

Street: AVENUE CIRCULAIRE 3

Town: BRUXELLES

Postcode: 1180

Country: Belgium

Department 2

Department name: Reactive gases in the atmosphere ☐ not applicable

☒ Same as organisation address

Street: AVENUE CIRCULAIRE 3

Town: BRUXELLES

Postcode: 1180

Country: Belgium

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **KONINKLIJK BELGISCH INSTITUUT VOOR**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: ○ Male ◉ Female

First name: **Martine** Last name: **De Maziere**

E-Mail: **martine.demaziere@aeronomie.be**

Position in org.: Director general a.i., Head of Division

Department: Scientific Directorate ☐ Same as organisation

☒ Same as organisation address

Street: AVENUE CIRCULAIRE 3

Town: BRUXELLES Post code: 1180

Country: Belgium

Website: www.aeronomie.be

Phone 1: +32-2-2730363 Phone 2: +32-2-3730400 Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Michael	Middernacht	michael.middernacht@aeronomie.be	
Bavo	Langerock	bavo.langerock@aeronomie.be	
Michel	Van Roozendael	michel.vanroozendael@aeronomie.be	
Nathalie	Kalb	nathalie.kalb@aeronomie.be	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NATIONAL UNIVERSITY OF IRELAND GAL**

PIC	***Legal name***
999978045	*NATIONAL UNIVERSITY OF IRELAND, GALWAY*

Short name: NATIONAL UNIVERSITY OF IRELAND GALWAY

Address of the organisation

Street UNIVERSITY ROAD

Town GALWAY

Postcode

Country Ireland

Webpage www.nuigalway.ie

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... yes

Research organisation ..... unknown

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... 2015 - no

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **NATIONAL UNIVERSITY OF IRELAND GAL**

Department(s) carrying out the proposed work

Department 1

Department name: Dept. of Physics ☐ not applicable

☒ Same as organisation address

Street: UNIVERSITY ROAD

Town: GALWAY

Postcode:

Country: Ireland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **NATIONAL UNIVERSITY OF IRELAND GAL**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Colin** Last name: **O'Dowd**

E-Mail: **colin.odowd@nuigalway.ie**

Position in org.: Professor Physics

Department: Physics ☐ Same as organisation

☒ Same as organisation address

Street: UNIVERSITY ROAD

Town: GALWAY Post code:

Country: Ireland

Website: http://www.nuigalway.ie/our-research/people/physics/colinodowd/

Phone 1: 00 353 91 493306 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Darius	Ceburnis	darius.ceburnis@nuigalway.ie	00353 91 492496
Lokesh	Joshi	vpresearch@nuigalway.ie	00353 91 49 5768
Dawn	Howard	dawn.howard@nuigalway.ie	
Aine	Ni Dhomhnaill	aine.nidhomhnaill@nuigalway.ie	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **ESTONIAN UNIVERSITY OF LIFE SCIENCE**

PIC	***Legal name***
999857280	*EESTI MAAULIKOOL*

Short name: ESTONIAN UNIVERSITY OF LIFE SCIENCES EMU

Address of the organisation

Street KREUTZWALDI 1

Town TARTU

Postcode 51014

Country Estonia

Webpage www.emu.ee

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2007 - no

SME self-assessment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **ESTONIAN UNIVERSITY OF LIFE SCIENCE**

Department(s) carrying out the proposed work

Department 1

Department name: Institute of Agricultural and Environmental Sciences ☐ not applicable

☒ Same as organisation address

Street: KREUTZWALDI 1

Town: TARTU

Postcode: 51014

Country: Estonia

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **ESTONIAN UNIVERSITY OF LIFE SCIENCE**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Steffen** Last name: **Noe**

E-Mail: **steffen.noe@emu.ee**

Position in org.: Senior Scientist

Department: EESTI MAAULIKOOL ☒ Same as organisation

☒ Same as organisation address

Street: KREUTZWALDI 1

Town: TARTU Post code: 51014

Country: Estonia

Website: http://smear.emu.ee

Phone 1: +372 7313207 Phone 2: +372 59192254 Fax: *+xxx xxxxxxxxx*

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **AU**

PIC	***Legal name***
999997736	*AARHUS UNIVERSITET*

Short name: AU

Address of the organisation

Street NORDRE RINGGADE 1

Town AARHUS C

Postcode 8000

Country Denmark

Webpage www.au.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2015 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: - - Not applicable

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **AU**

Department(s) carrying out the proposed work

Department 1

Department name: Department of Environmental Science ☐ not applicable

☐ Same as organisation address

Street: Frederiksborgvej 399

Town: Roskilde

Postcode: 4000

Country: Denmark

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **AU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Henrik** Last name: **Skov**

E-Mail: **hsk@envs.au.dk**

Position in org.: Professor

Department: Department of Environmental Science ☐ Same as organisation

☐ Same as organisation address

Street: Frederiksborgvej 399

Town: Roskilde Post code: 4000

Country: Denmark

Website: http://pure.au.dk/portal/en/hsk@au.dk

Phone 1: +45-87158524 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Andreas	Massling	anma@envs.au.dk	
Susanne	Hoej	susanne.hoej@au.dk	
Anya B.	Vinstrup	abv@au.dk	
Jesper Juel	Holst	jjh@au.dk	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **INSTITUTE OF NUCLEAR RESEARCH AND**

PIC	***Legal name***
999482181	*INSTITUTE OF NUCLEAR RESEARCH AND NUCLEAR ENERGY - BULGARIAN ACADEMY OF SCIE*

Short name: INSTITUTE OF NUCLEAR RESEARCH AND NUCLEAR ENERGY - BULGARIAN ACADEMY OF SCIENCES

Street Tzarigradsko Shose 72

Town SOFIA

Postcode 1784

Country Bulgaria

Webpage http://www.inrne.bas.bg

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: - - Not applicable

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **INSTITUTE OF NUCLEAR RESEARCH AND**

Department(s) carrying out the proposed work

Department 1

Department name: BEO Moussala ☐ not applicable

☒ Same as organisation address

Street: Tzarigradsko Shose 72

Town: SOFIA

Postcode: 1784

Country: Bulgaria

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530**	*Acronym* **ACTRIS PPP**	*Short name* **INSTITUTE OF NUCLEAR RESEARCH AND**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. | Sex: (•) Male ( ) Female

First name: **Ivo** | Last name: **Kalapov**

E-Mail: **kalapov@inrne.bas.bg**

Position in org.: Assistant Professor

Department: BEO Moussala | [ ] Same as organisation

[x] Same as organisation address

Street: Tzarigradsko Shose 72

Town: SOFIA | Post code: 1784

Country: Bulgaria

Website: http://beo-db.inrne.bas.bg/moussala/

Phone 1: +359 2 979 5612 | Phone 2: *+xxx xxxxxxxxx* | Fax: *+xxx xxxxxxxxx*

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **JRC**

PIC	***Legal name***
999992304	*JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION*

Short name: JRC

Address of the organisation

Street Rue de la Loi 200

Town BRUSSELS

Postcode 1049

Country Belgium

Webpage http://www.jrc.ec.europa.eu

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... yes
Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2007 - no
SME self-assessment ..... unknown
SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **JRC**

Department(s) carrying out the proposed work

Department 1

Department name: Institute for Environment and Sustainability - Air & Climate Unit ☐ not applicable

☐ Same as organisation address

Street: via Fermi 2749

Town: Ispra (VA)

Postcode: 21027

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **739530** *Acronym* **ACTRIS PPP** *Short name* **JRC**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Jean-Philippe** Last name: **Putaud**

E-Mail: **jean.putaud@jrc.ec.europa.eu**

Position in org.: Scientific Officer

Department: Institute for Environment and Sustainability - Air & Climate Unit ☐ Same as organisation

☐ Same as organisation address

Street: via Fermi 2749

Town: Ispra (VA) Post code: 21027

Country: Italy

Website: https://connected.cnect.cec.eu.int/community/jrc/ies/

Phone 1: +390332785041 Phone 2: +xxx xxxxxxxxx Fax: +390332785022

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Rosemarie	MARABELLI	rosemarie.marabelli@ec.europa.eu	

Proposal ID **739530** *Acronym* **ACTRIS PPP**

3 - Budget for the proposal

No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of sub-contracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F+G)	(I) Reimburse-ment rate (%)	(J) Max.EU Contribution / € (=H*I)	(K) Requested EU Contribution/ €
1	Fmi	FI	322000	125500	0	0	0	111875,00	0	559375,00	100	559375,00	559375,00
2	Uhel	FI	324000	28500	0	0	0	88125,00	0	440625,00	100	440625,00	440625,00
3	Cnr	IT	342000	62500	0	0	0	101125,00	0	505625,00	100	505625,00	505625,00
4	Cnrs	FR	320250	48000	0	0	0	92062,50	0	460312,50	100	460312,50	460312,50
5	Inoe	RO	137358	30000	20800	0	0	41839,50	0	229997,50	100	229997,50	229997,50
6	Cesky Hydrometeorol ogicky Ustav	CZ	63588	13500	0	0	0	19272,00	0	96360,00	100	96360,00	96360,00
7	Tropos	DE	212000	38400	0	0	0	62600,00	0	313000,00	100	313000,00	313000,00
8	Kit	DE	59625	9600	0	0	0	17306,25	0	86531,25	100	86531,25	86531,25
9	Noa	EL	110500	17500	0	0	0	32000,00	0	160000,00	100	160000,00	160000,00
10	Norsk Institutt For Luftforskning	NO	171224	8300	0	0	0	44881,00	0	224405,00	100	224405,00	224405,00

11	Upc	ES	75000	10000	0	0	0	21250,00	0	106250,00	100	106250,00	106250,00
12	Csic	ES	17628	2000	0	0	0	4907,00	0	24535,00	100	24535,00	24535,00
13	Uva	ES	30954	4000	0	0	0	8738,50	0	43692,50	100	43692,50	43692,50
14	University Of Manchester	UK	24000	4800	0	0	0	7200,00	0	36000,00	100	36000,00	36000,00
15	Nerc	UK	24000	4800	0	0	0	7200,00	0	36000,00	100	36000,00	36000,00
16	Science And Technology Facilities	UK	34000	5120	0	0	0	9780,00	0	48900,00	100	48900,00	48900,00
17	Knmi	NL	81600	14500	0	0	0	24025,00	0	120125,00	100	120125,00	120125,00
18	Psi	CH	36000	5500	0	0	0	10375,00	0	51875,00	100	51875,00	51875,00
19	Empa	CH	48000	5500	0	0	0	13375,00	0	66875,00	100	66875,00	66875,00
20	Cyi	CY	32500	12000	0	0	0	11125,00	0	55625,00	100	55625,00	55625,00
21	Igf Pas	PL	32150	12800	0	0	0	11237,50	0	56187,50	100	56187,50	56187,50
22	Lunds Universitet	SE	32100	5000	0	0	0	9275,00	0	46375,00	100	46375,00	46375,00
23	Koninklijk Belgisch Instituut Voor	BE	28560	6600	0	0	0	8790,00	0	43950,00	100	43950,00	43950,00
24	National University Of Ireland Galway	IE	19200	12800	0	0	0	8000,00	0	40000,00	100	40000,00	40000,00
25	Estonian University Of Life Sciences	EE	19200	12800	0	0	0	8000,00	0	40000,00	100	40000,00	40000,00

26	Au	DK	21900	9800	0	0	0	7925,00	0	39625,00	100	39625,00	39625,00
27	Institute Of Nuclear Research And	BG	9000	12800	0	0	0	5450,00	0	27250,00	100	27250,00	27250,00
28	Jrc	BE	27000	5400	0	0	0	8100,00	0	40500,00	100	40500,00	40500,00
	Total		2655337	528020	20800	0	0	795839,25	0	3999996,25		3999996,25	3999996,25

Proposal ID **739530** *Acronym* **ACTRIS PPP**

4 - Ethics issues table

1. HUMAN EMBRYOS/FOETUSES		Page
Does your research involve Human Embryonic Stem Cells (hESCs)?	○ Yes ◉ No	
Does your research involve the use of human embryos?	○ Yes ◉ No	
Does your research involve the use of human foetal tissues / cells?	○ Yes ◉ No	
2. HUMANS		**Page**
Does your research involve human participants?	○ Yes ◉ No	
Does your research involve physical interventions on the study participants?	○ Yes ◉ No	
3. HUMAN CELLS / TISSUES		**Page**
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	○ Yes ◉ No	
4. PERSONAL DATA		**Page**
Does your research involve personal data collection and/or processing?	○ Yes ◉ No	
Does your research involve further processing of previously collected personal data (secondary use)?	○ Yes ◉ No	
5. ANIMALS		**Page**
Does your research involve animals?	○ Yes ◉ No	
6. THIRD COUNTRIES		**Page**
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	○ Yes ◉ No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	○ Yes ◉ No	
Do you plan to import any material - including personal data - from non-EU countries into the EU?	○ Yes ◉ No	
Do you plan to export any material - including personal data - from the EU to non-EU countries?	○ Yes ◉ No	
In case your research involves low and/or lower middle income countries, are any benefits-sharing actions planned?	○ Yes ◉ No	
Could the situation in the country put the individuals taking part in the research at risk?	○ Yes ◉ No	

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7. ENVIRONMENT & HEALTH and SAFETY		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	○ Yes ◉ No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	○ Yes ◉ No	
Does your research involve the use of elements that may cause harm to humans, including research staff?	○ Yes ◉ No	
8. DUAL USE		**Page**
Does your research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	○ Yes ◉ No	
9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS		**Page**
Could your research raise concerns regarding the exclusive focus on civil applications?	○ Yes ◉ No	
10. MISUSE		**Page**
Does your research have the potential for misuse of research results?	○ Yes ◉ No	
11. OTHER ETHICS ISSUES		**Page**
Are there any other ethics issues that should be taken into consideration? Please specify	○ Yes ◉ No	

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents. ☒

How to Complete your Ethics Self-Assessment

Proposal ID **739530** *Acronym* **ACTRIS PPP**

5 - Call specific questions

Data management activities

A new focus within Horizon 2020 is data management, for example through the use of Data Management Plan (DMP).

DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

The use of a DMP is required for projects participating in the Open Research Data Pilot in the form of a deliverable in the first 6 months of the project (possible updates during the project).

Other projects are invited to submit a DMP if relevant for their planned research.

Are data management activities relevant for your proposed project?	◉ Yes ○ No
A Data Management Plan will be delivered (Please note: a Data Management Plan (DMP) is required for projects participating in the Open Research Data Pilot in Horizon 2020, in the form of a deliverable in the first 6 months of the project. All other projects may deliver a DMP on a voluntary basis, if relevant for their research).	☒
Data Management is part of a Work Package.	☒
Data Management will be integrated in another way.	☐

Please indicate how data management will be addressed in your project:

Please indicate how data management will be addressed in your project.

Open Research Data Pilot in Horizon 2020

If selected, all applicants will participate in the Pilot on Open Research Data in Horizon 2020 , which aims to improve and maximise access to and re-use of research data generated by actions.

Participants in the Pilot will be invited to formulate a Data Management Plan (DMP). DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

Participating in the Pilot is flexible in the sense that it does not mean that all research data needs to be open. Rather, projects can define certain datasets to remain closed via a Data Management Plan (DMP).

Applicants also have the possibility to opt out of this Pilot. In this case, applicants must indicate a reason for this choice (see options below).

Please note that participation in this Pilot does not constitute part of the evaluation process. Proposals will not be penalised for opting out.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.	○ Yes ◉ No

ACTRIS PPP

- Aerosols, Clouds and Trace gases Preparatory Phase Project

INFRADEV-02-2016

Coordination and support actions

List of participants

Participant No	Participant organization name	Country
1	Ilmatieteen laitos (FMI) (Coordinator)	Finland
2	Helsingin yliopisto (UHEL)	Finland
3	Consiglio Nazionale Delle Ricerche (CNR)	Italy
4	Centre National de la Recherche Scientifique (CNRS)	France
5	National Institute of R&D for Optoelectronics (INOE)	Romania
6	Český Hydrometeorologický Ústav (CHMI)	Czech Republic
7	Leibniz-Institut für Troposphärenforschung e.V (TROPOS)	Germany
8	Karlsruher Institut für Technologie (KIT)	Germany
9	National Observatory of Athens (NOA)	Greece
10	Norsk Institutt for Luftforskning (NILU)	Norway
11	Universitat Politècnica de Catalunya (UPC)	Spain
12	Agencia Estatal Consejo Superior de Investigaciones Cientificas (CSIC)	Spain
13	Universidad de Valladolid (UVA)	Spain
14	University of Manchester (UMAN)	United Kingdom
15	National Environmental Research Council (NERC)	United Kingdom
16	Science and Technology Facilities Council (STFC)	United Kingdom
17	Koninklijk Nederlands Meteorologisch Instituut (KNMI)	Netherlands
18	Paul Scherrer Institut (PSI)	Switzerland
19	Eidgenössische Materialprüfungs und Forschungsanstalt (EMPA)	Switzerland
20	The Cyprus Institute (CyI)	Cyprus
21	Instytut Geofizyki Polskiej Akademii Nauk (IGF PAS)	Poland
22	Lunds Universitet (ULund)	Sweden
23	Koninklijk Belgisch Instituut voor Ruimte-Aeronomie (BIRA-IASB)	Belgium
24	National University of Ireland Galway (NUIG)	Ireland
25	Estonian University of Life Sciences (EULS)	Estonia
26	Aarhus Universitet (AU)	Denmark
27	Institute for Nuclear Research and Nuclear Energy (INRNE)	Bulgaria
28	Joint Research Centre (JRC) of the European Commission	Belgium

Contents

Definitions

Projects and research infrastructure (RI)

ACTRIS - Aerosols, Clouds and Trace Gases Research Infrastructure – a research infrastructure listed in the ESFRI roadmap and initiative aiming to have own legal entity and being operational in 2025.

ACTRIS PPP - Aerosols, Clouds and Trace Gases Research Infrastructure Preparatory Phase Project (INFRADEV-2) under Horizon-2020. The project applied with this proposal.

ACTRIS-2 - Aerosols, Clouds and Trace Gases Research Infrastructure Integrated Activity (INFRAIA-1) project under Horizon-2020. A project funded for 2015-2019, Grant Agreement number 654109.

ACTRIS I3 - Aerosols, Clouds and Trace Gases Research Infrastructure Integrated Infrastructure Initiative (I3) project, under FP7. A project funded for 2011-2015, Grant Agreement 262254

Phases

ACTRIS implementation phase – consists of planning and construction of national and European level ACTRIS components and services, 2016 – 2021.

ACTRIS operational phase – consists of pre-operational (2021 – 2025) and fully operational (2025 onwards) phases, when ACTRIS operations and services will be available and ramped up to their full capacity.

Actors

ACTRIS community - refers to the science community active in planning and constructing the ACTRIS activities, both at the national and European level.

National ACTRIS consortium – a group of research preforming organisations that have a formal collaboration agreement among them and have a clear governance/management structure and national ACTRIS contact person towards ACTRIS.

ACTRIS member - a country participating in the implementation of ACTRIS and being a member in the Interim ACTRIS Council.

ACTRIS Coordination Team – consists of the Coordinators and Co-coordinators of the ACTRIS-2 and ACTRIS PPP projects and the management office members from both projects.

Stakeholder – a general term referring to the ministry, funding or research organization representative with ability to take funding decisions.

User – a user of ACTRIS data, services or physical access to ACTRIS facilities.

RI components of ACTRIS

National Facility (NF) – an observatory or exploratory platform providing data and/or physical access to the platform within ACTRIS.

Central Facility (CF) – European level ACTRIS components, including ACTRIS Head Office, ACTRIS Data Centre, or specified ACTRIS Calibration Centres.

Head Office – a Central Facility coordinating and representing ACTRIS, and holding the statutory seat.

ACTRIS Data Centre (DC) – a Central Facility being responsible for ACTRIS data curation, distribution and storage. Hosts ACTRIS data portal.

Calibration Centre (CC) – Central Facilities responsible for calibration of pre-defined instruments within ACTRIS.

Service and Access Management Unit (SAMU) – a part of ACTRIS Head Office facilitating the evaluation of proposals for physical access to ACTRIS Central Facilities and selected National Facilities.

Governing bodies of ACTRIS in the implementation phase

Interim ACTRIS Council - a council of ministry- and funding organization representatives of ACTRIS member before ACTRIS legal entity has been established (during the ACTRIS implementation phase), superior decision making body of ACTRIS.

Interim Scientific and implementation Advisory Board – a board of external experts in atmospheric sciences and in RI implementation. This board advises both the Interim Council and ACTRIS PPP in their work.

Interim Ethical Board – a board advising Interim Council and ACTRIS PPP in ethical issues.

Interim RI Committee – a committee consisting of representatives of each ACTRIS Central Facility and National Facility representatives. This committee supports ACTRIS PPP coordinator in implementing ACTRIS components.

ACTRIS PI Assembly – a platform for ACTRIS National Facility Principle Investigators to interact with each other and with ACTRIS Central Facilities. ACTRIS PI assembly selects the three NF representatives to Interim RI Committee.

A User Forum – a forum consisting external experts and ACTRIS users, advising the ACTRIS PPP coordinator and later Director General of ACTRIS from the user point-of-view.

Governance and management bodies of ACTRIS PPP

ACTRIS PPP partners – those RPOs that are beneficiaries or linked third parties to ACTRIS PPP.

ACTRIS PPP General Assembly (GA) - is the internal decision-making body of the PPP, consists of one authorized representative of each beneficiary.

ACTRIS PPP Executive Board (EB) - is in charge of the execution of the PPP project, consists of the Coordinator, Co-Coordinator, WP Leaders and project managers of ACTRIS PPP.

ACTRIS PPP Consortium – the group consisting of ACTRIS PPP partners and ACTRIS PPP associate partners

ACTRIS PPP Project Management Office – consists of coordinators and project managers of ACTRIS PPP.

Associate Partnership Programme – a programme through which interested parties can be formally linked to ACTRIS PPP.

ENVRI cluster – a group of 21 European environmental ESFRI RIs and other RI networks that work together in common technical, strategy and policy related matters and have a common decision body.

ENVRI Reference Model - a conceptual framework enabling interoperability among RI; reuse; and share resources, experiences and common language. It is based on the Reference Model for Open Distributed Processing (RM-ODP).

Project consortium

Beneficiary - an organization (party) that is a direct beneficiary to ACTRIS PPP. Responsible to EC for its own and its Linked Third Parties work and funding shares in the project.

Linked Third Party (LTP) - an organization linked to a beneficiary with its own budget including funding for manpower.

Associate Partner - an organization participating in ACTRIS activities but not as ACTRIS PPP partner. Associate partners are eligible for applying ACTRIS PPP travel funding from their national beneficiaries or from the project coordination.

Levels of support

Ministry-level political support - a signed statement from a ministry or national RI funding agency stating support at political level for implementing ACTRIS.

Ministry-level funding commitment - a signed statement from a ministry or national research infrastructure funding agency a stating funding commitment for implementing ACTRIS.

RPO support - a signed statement from a research performing organization stating their commitment for covering their share of the costs in implementing ACTRIS

List of Acronyms

AEROCOM	Aerosol Comparisons between Observations and Models
AERONET	Aerosol Robotic Network
ANAEE	Infrastructure for Analysis and Experimentation on Ecosystems
ARISE	Atmospheric dynamics Research Infrastructure in Europe
CA	Consortium Agreement
CLRTAP	Convention on Long Range Trans-boundary Air Pollution
Copernicus	European system for monitoring the Earth
DOI	Digital Object Identifier
EC	European Commission
EGI	European Grid Infrastructure cluster
EEA	European Environmental Agency
EMEP	European Monitoring and Evaluation Programme
ENVRI	Environmental Research Infrastructure
ENVRIplus	H2020 INFRADEV-4 project
EPOS	European Plate Observing System
ERA	European Research Area
ERIC	European Research Infrastructure Consortium
ESA	The European Space Agency
ESFRI	European Strategy Forum on Research Infrastructures
EUFAR	European Facility for Airborne Research
EUMETNET	European Meteorological Services Network
EURO-ARGO	European contribution to Argo program (broad-scale global array of temperature/salinity profiling boats)
EUROCHAMP	Research Infrastructure Network of European Simulation Chambers Investigating Atmospheric Processes
FAIR	Findable, Accessible, Interoperable, and Re-usable data
FluxNet	Global Network of Flux Networks
FP5	Fifth Framework Program
GAW	Global Atmosphere Watch
GCOS	Global Observing System for Climate
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
IAGOS	In-Service Aircraft for a Global Observing System.
ICOS	European Research Infrastructure to measure atmospheric greenhouse gas concentrations
ICT	Information and communications technology
IDRIS	OECD International Distributed Research Infrastructures report
IPR	Intellectual property rights
KPI	Key Performance Indicator
LoI	Letter of Intent
LTER	Long Term Ecological Research Network
NDACC	Network for the Detection of Atmospheric Composition Change
PRACE	Partnership for Advanced Computing in Europe
QA	Quality Assurance
RI	Research Infrastructure
RPO	Research Performing Organization
SIOS	Svalbard Integrated Earth Observing System
SLCP	Short-lived climate pollutants
SME	Small Medium Enterprise
SolRad-Net	Solar Radiation Network
SWOT	Strengths, Weaknesses, Opportunities and Threats analysis
UNECE	Economic Commission for Europe
WMO	World Meteorological Organization
WP	Work Package

1. Excellence

The Research Infrastructure (RI) ACTRIS – Aerosols, Clouds and Trace Gases - is the pan-European initiative that unites the observations and related research of aerosols, clouds, and trace gases amongst European partners to provide high-quality research infrastructure services to a wide user community.

ACTRIS has been selected for the ESFRI roadmap in 2016, by ESFRI and its evaluation panels, having reviewed ACTRIS to meet the criteria of high-level science excellence, to have pan-European added-value, to be mature enough to proceed with the implementation and to have a strong support and financial commitments from the participating countries.

ACTRIS enables research on the direct and indirect effects of aerosols and clouds that form the major uncertainty in predicting climate change. ACTRIS supports research for understanding processes driving the atmospheric pollutants involved in deteriorating air quality and causing adverse health and ecosystem impacts. For these reasons, ACTRIS will be the fundamental European research component of global, regional, and national observation and exploration systems for short-lived climate forcers, guiding the development and operational requirements for fulfilling future atmospheric observational needs. ACTRIS contributes in resolving the uncertainties in climate and earth system models towards the development of sustainable solutions for responding to environmental challenges.

ACTRIS benefits European society in several ways. ACTRIS provides unique data and understanding of atmospheric processes related to air pollution, aerosol-cloud interactions, and climate change. This data and knowledge allows society to better identify atmospheric hazards, climate change and health issues supporting society in its response and mitigation policies. For example, the Eyjafjallajökull volcanic eruption in 2010 demonstrated the unique capability of the ACTRIS community to rapidly provide relevant information on the state of the atmosphere for civil aviation authorities.

The cutting-edge science within the framework of ACTRIS leads to new innovations and economic enhancement. ACTRIS-related activities have already resulted in many patents, spin-off companies, and new technologies transferred to the markets. ACTRIS has developed private sector collaboration with more than 80 companies. The positive impacts related to technological development and knowledge transfer are expected to increase in the future with a sustained ACTRIS research infrastructure.

ACTRIS provides fully documented world-class continuous measurement data free of charge to users via the ACTRIS Data Centre. Together with this data, ACTRIS provides unique instrument calibration services, physical access to the research platforms in the best atmospheric measurement facilities in Europe and dissemination of expert knowledge via training.

The ACTRIS community comprises world-leading expertise in atmospheric science, observation, process studies, data analysis and modelling, data management, delivery procedures, and in RI management. The best available knowledge of the measurement instruments and atmospheric data dissemination in Europe are included in the ACTRIS consortium. Furthermore, ACTRIS is supported by 21 European countries with their wide-ranging national scientific communities representing more than 100 research organizations within the current ACTRIS consortium.

The need for long-term RI for atmospheric research

The ability to predict the future behaviour of the atmosphere over multiple time scales, from hours to decades, benefits society in many sectors including energy, heath, security, economy and policy. ACTRIS supports research and knowledge enrichment in areas ranging from short-term hazardous weather, heat-waves, and health issues, to long-term evaluation of climate change and policy effectiveness in mitigation. All atmospheric predictions use complex models that are underpinned by observations. High quality observations are necessary to constrain the processes that these predictive models are attempting to describe; since without these, forecasting the interaction and feedback between the multitude of processes in the atmosphere becomes highly unreliable at longer timescales. Without a clear understanding of the mechanisms determining climate change or pollution episodes, prediction of these atmospheric processes will not be improved.

ACTRIS produces high-quality observations of short-lived climate pollutants (SLCPs) that have a residence time in the atmosphere from hours to a few weeks, and increases the capacity for understanding the processes driving their life cycle and their impacts on climate and air quality. The short lifetimes make their concentrations highly variable in time and space and involve processes that are not well understood. These considerations set the SLCPs apart from the long-lived greenhouse gases, and emphasises the need for maintaining Europe's long-term capacity for documenting the variability of short-lived trace gases and aerosol, and exploring the physical and chemical processes involved in driving their variability and resultant impacts. ACTRIS will enhance the capacity of European research to:

- Reduce uncertainties in future-climate predictions and climate feedback mechanisms.
- Reduce air pollution and consequently evaluate the effect on health and ecosystems in Europe and worldwide through deeper understanding of the determinants driving SLCP emissions and sinks and their atmospheric spatial and temporal variability.
- Address complex issues related to climate–chemistry interaction for which the level of scientific understanding is low.
- Ensure that Europe retains its place as the world-leader in the field of atmospheric research by enabling continuous upgrading of the RI to respond to new scientific and societal challenges.

This is the grand challenge for ACTRIS.

1.1 Objectives

Strategic goals of ACTRIS

The ESFRI Roadmap 2016 identified ACTRIS as a new important pan-European research infrastructure for the European scientific community. ACTRIS has been deemed mature enough to be operational within the next ten years. With ESFRI-status, ACTRIS shall further develop its organizational and operational framework, and long-term strategic goals. Here, the supporting role of the ACTRIS Preparatory Phase Project (ACTRIS PPP) will be crucial.

The ACTRIS concept, design and implementation strategy has a long heritage of decades that has been developed through diverse atmospheric research related projects since FP5, converging to FP-7 I3-project ACTRIS (2011-2015) and Horizon-2020 IA project ACTRIS-2 (2015-2019). The main activities in ACTRIS-2 are related to providing transnational access for users, strengthening the measurement and calibration capabilities, and developing data comparability and data life-cycles. ACTRIS-2 facilitates the improvement of the technical level of planned RI services, enhances RI collaboration on a national, regional and global scale, and encourages public-private partnerships and collaboration.

The ACTRIS PPP is the tool to define the most appropriate and cost-efficient long-term organization for ACTRIS. ACTRIS PPP builds on the outcome of previous ACTRIS projects, and will run in parallel with ACTRIS-2. ACTRIS PPP will establish the legal, financial and administrative elements of ACTRIS and finalise the planning of the technical work and support the construction of ACTRIS facilities. The decisions on site locations and service portfolio will be performed within the framework of ACTRIS PPP. In addition, ACTRIS PPP will develop the service policies and RI access requirements, establishing a service access management unit to provide coordinated and easy access to RI services for users.

With reference to the status of ACTRIS implementation and the distributed nature of the ACTRIS research infrastructure, the strategic goals of ACTRIS PPP are to:

1. establish the most suitable governance and management structure for ACTRIS at European level;
2. support the establishment of ACTRIS as a legal entity via mutual agreement among the countries involved regarding the core legal entity and the governance structure of the infrastructure for its long-term operation;
3. develop the ACTRIS financial framework implementing the financial commitments of the ACTRIS members;
4. identify and select the core National and Central Facilities of ACTRIS and finalise the required technical work of the RI;
5. analyse the socio-economic impact of ACTRIS, link ACTRIS with European and international components of Earth observation and Earth system science (e.g. Group on Earth Observation, GEO), develop the longer-term overall strategy of the RI, and to build up the necessary agility of operation to meet future user requirements.

In view of the current maturity of the facilities and services, it is considered that three years will be sufficient to achieve the objectives listed above. Effective coordination and management, together with the current existing collaboration will ensure that the work regarding the legal, financial, administrative, scientific and technical elements of ACTRIS will progress as planned, and that efficient communication between the scientific consortium partners and between the scientific community and stakeholders will be enabled. The development of an effective risk management plan will contribute to the feasibility of ACTRIS implementation.

1.2 Relation to the work programme

The ACTRIS PPP proposal addresses the topic *INFRADEV-2-2016 Preparatory Phase and support to early phase of ESFRI projects* within the H2020 Work Programme 2016-2017 on European Research Infrastructures (including e-infrastructures). The pathways for addressing the specific challenges and the scope of the call topic for ESFRI preparatory phase within ACTRIS PPP are described below.

1- Enhancing the likelihood that the infrastructure will be built: Even though ACTRIS is on the ESFRI 2016 Roadmap, the roadmap status does not guarantee that ACTRIS will be implemented. There are many preliminary decisions to be taken by the scientific community together with the stakeholders and funding agencies during the implementation of ACTRIS. However, there is a strong need for a coordinated research infrastructure rather than a short-term project-type network of research stations and it is this is pushing the implementation of ACTRIS forward. During ACTRIS PPP, the ultimate aim is to converge the work on legal, governance, financial and administrative frameworks towards a legal entity with well-developed and well-defined operational services. By the end of this project it is expected that the member countries will have signature-ready documents to proceed with the political and financial commitments ensuring the long term support for ACTRIS.

2- Bringing ACTRIS to the proper level of legal and financial maturity required for the operational phase: ACTRIS PPP provides coordinated support for the work in setting up the organizational framework of ACTRIS as a research infrastructure at a sufficiently mature level. In this project the involvement of stakeholders and funding bodies is crucial as they play an important role for decisions and agreements on the key documents leading to the establishment of the ACTRIS legal entity. Active communication with the stakeholders and funding agencies will be maintained and facilitated throughout the project via effective coordination and management actions.

3- Bringing ACTRIS to the proper level of technical maturity required for implementation: Due to the long history of collaboration within the ACTRIS community, many of the physical facilities of ACTRIS are already in place today. The technology required for ACTRIS exists, thus there are no technological obstacles in setting up the infrastructure. In this project, a major focus is on coordinating the establishment of ACTRIS unified operational services and technological construction to ensure high-quality services for the users.

4- Enhancing and strengthening support and commitments from stakeholders: ACTRIS has attracted interest across Europe at both country and institutional level. As of May 2016, five countries have already provided ministry-level support and funding commitments for the implementation of ACTRIS. In addition, seven other European countries have political commitments in place. Even though the scientific consortium in ACTRIS PPP does not include stakeholders as direct beneficiaries, the content of the Work Packages will focus on facilitating the work of the stakeholders for establishment of ACTRIS into a fully operational legal RI entity in Europe. As the technological readiness is already in place, with most of the physical facilities existing, the construction of ACTRIS consists more of decisions, agreements and commitments than physical construction. For this reason, the involvement of ministries and other involved stakeholders and decision makers will be constantly strengthened throughout the project.

5- Widening the infrastructure user-base and preparing for the future: ACTRIS is user-oriented and responds to societal requirements that are obviously evolving. ACTRIS must be able to respond to increasing demands within a complex multidisciplinary Earth system. The atmosphere interacts closely with the biosphere, hydrosphere, cryosphere, and lithosphere, and the changes in any of these components are directly or indirectly connected with the others via intricately-linked processes and feedbacks. Hence, ACTRIS will enhance the links with other Environmental RIs, offering complementary services and interacting particularly with those offered by e.g., the ESFRI Landmark ICOS ERIC (*Integrated Carbon Observation System),* the ESFRI Landmark IAGOS (*In-service Aircraft for a Global Observing System*), the ESFRI Project ANAEE (*Infrastructure for Analysis and Experimentation on Ecosystems*), and the ESFRI Project SIOS (*Svalbard Integrated Observation System*). ACTRIS will continue to work in close collaboration with existing large-scale observation networks such as EMEP, WMO GAW, FluxNet, AERONET, SolRad-Net, where possible, with national air quality networks and, where appropriate, collaboration with the European Metrological Research Programme. ACTRIS already has 18 letters of support from the main collaborating RIs, observational programmes and other initiatives as an expression of support for the establishment of ACTRIS.

1.3 Concept and methodology, quality of the coordination, and support measures

The overall concept of ACTRIS PPP is to bring the project to the level of legal, organizational, financial, and operational maturity required for the operational phase as a well-structured and legally-independent RI. ACTRIS PPP enables the transition from the project-based organization of ACTRIS-2 to an integrated pan-European distributed research infrastructure. Because of the international nature of ACTRIS, the high expectations of users, and the participation of many users from different user committees, the responsibilities transferred to the common structure

will have to be carefully defined. In addition, liability issues and other legal and ethical concerns will need to be thoroughly examined.

The ACTRIS Concept

ACTRIS PPP builds on the concept developed for ACTRIS (ESFRI roadmap) and is organized around the following building blocks (see Figure 1): **National Facilities (NFs)** (observation platforms, stationary and mobile exploratory platforms hosted and operated at the national level) located both within Europe and globally, documenting with high precision and reliability the 4D-variability of short-lived atmospheric species, in particular those involved in climate forcing and the processes driving their life-cycle; and **Central Facilities (CFs)** (Calibration Centres, Data Centre, Head Office hosted and operated at the European level) that are fundamental for ensuring that ACTRIS procedures and policies are respected and maintained. The Central Facilities are required to ensure that all data are produced, treated and quality-controlled with specified procedures, properly archived for long-term usage, and accessible in a timely manner to all users. ACTRIS Central Facilities are also fundamental in coordinating physical access to ACTRIS National Facilities and providing the appropriate level of training and education, both within and outside the RI, as well as delivering tailored services for specific users: the scientific community, space agencies, Copernicus and the private sector, and others.

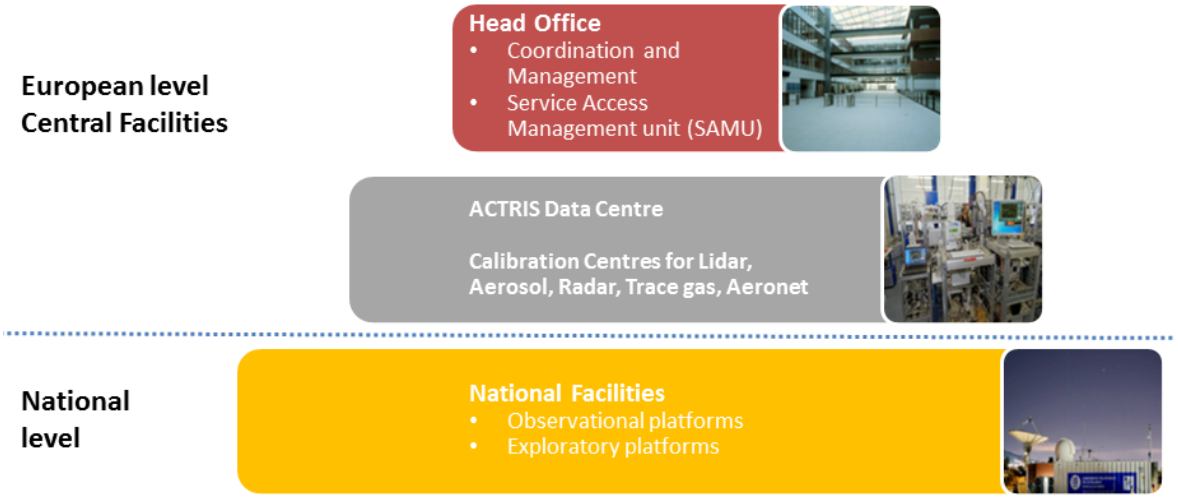


Figure 1. *ACTRIS research infrastructure core components; National and Central Facilities, including the indication of national and European level operations.*

ACTRIS engages the National Facilities with highly standardized and coordinated procedures. The production of harmonized, reliable and documented observational data within ACTRIS relies on appropriate Central Facilities (Calibration Centres, Data Centre) that ensure compliance with standard operating procedures and/or quality protocols across the entire RI. Central Facilities also provide support to the National Facilities in the form of training and technical assistance together with on-site support for specific actions. Central Facilities are responsible for the definition of ACTRIS data products, including definition of quality requirements, format and nature of delivery (near real time or consolidated), flagging and development of value-added products. Central Facilities will be essential for the training of RI operators and users of ACTRIS. More specifically, **Calibration Centres** provide the infrastructure with:

- Standard operation procedures and best practices;
- Quality-assurance criteria;
- Intercomparison of instruments and procedures;
- Development and testing of new instrumentation for variables that are not yet accessible at the required sensitivity/accuracy;
- Training of RI managers, staff, data providers, and users

The data curation and repository services, including data management and necessary development work on, workflow documentation, metadata issues, etc., are handled by a dedicated Central Facility, the **ACTRIS Data Centre (DC)**. All primary data and added-value data products are made available to the users via the ACTRIS data portal. ACTRIS DC will provide scientists and other user groups with free and open access to all ACTRIS infrastructure data, complemented with access to innovative and mature data products, and tools for quality assurance (QA), data analysis and research. ACTRIS follows the open research data initiative of the Commission, making data discoverable (DOI identification), accessible (via open licence) and assessable (via necessary documentation and description). ACTRIS

data products are for the benefit of society, thus the data are made interoperable, adhere to specific quality standards and are free of charge. ACTRIS metadata are also distributed and made available for European and global metadata search systems, such as GAW and Global Earth Observation System of Systems (GEOSS), for improving the discoverability of the data sets to end users.

Besides data services and access to data products, ACTRIS will also offer physical and remote access to Calibration Centres and physical access to selected National Facilities. This includes access to calibration services, use of high-class instruments and equipment, knowledge transfer from the expertise of the staff, training and educational services. Access will be granted by the ACTRIS **Service and Access Management Unit (SAMU)** based on reviews of access applications. A single entry point to request physical and remote access to ACTRIS Facilities, and a fast and transparent review process will lower the barrier for new researchers to benefit from the existing infrastructure and achieve high-impact experience and results. SAMU is integrated within the **ACTRIS Head Office (HO)** which coordinates the research infrastructure operations, facilitates the strategic decision-making, and represents ACTRIS beyond the science community.

ACTRIS ensures the proper level of communication between operators in Central and National Facilities A specific committee within the ACTRIS governance structure, the RI Committee, will ensure consistency, coherence and stability of the operation of ACTRIS. The RI Committee will consist of representatives from ACTRIS Central and National Facilities.

Overall methodology of ACTRIS PPP

ACTRIS PPP will be a fundamental support instrument for ACTRIS for the development of the organizational, operational and strategic framework of ACTRIS. Much of the scientific and technical development necessary for the RI has already been performed within the ACTRIS-I3 project and continues within the current ACTRIS-2 project. Additionally, national funding to support the overall implementation and the construction of the National and Central Facilities is crucial and ACTRIS PPP will help to pool the national resources.

The planned implementation of ACTRIS PPP consists of organizational and operational activities that are required to achieve the operational phase (see Figure 2). The main tasks for the operational activities are to define requirements, policies and protocols for the operational facilities, i.e., NFs, CFs, and SAMU, and to generate the necessary services and service platforms. Actions and tasks related to the organizational development of ACTRIS comprise setting up the governing structure and bodies (including the interim stages for the implementation phase and the permanent stages for the operational phase), establishing the legal and policy frameworks, and developing the financial plan. The operational and organizational tasks of the implementation will run in parallel and are strongly interlinked. Also necessary is the planning of the long-term ACTRIS strategic development and liaison activities.

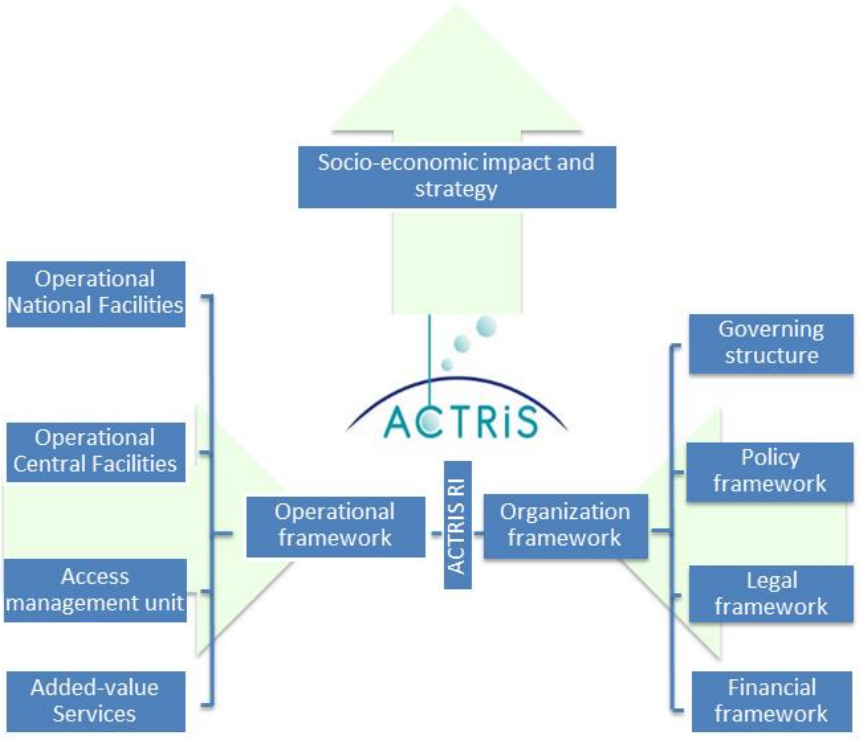


Figure 2. *The planned ACTRIS research infrastructure implementation activities.*

ACTRIS PPP will define the conditions for establishing the ACTRIS legal entity and for entering its operational phase. It will put in place the proper level of **internal interim governance,** ensure constant communication with governmental authorities and stakeholders for preferred options and create the **interim body for decision-making**. ACTRIS PPP will establish its highest decision making body, an **Interim ACTRIS Council**, that consists of representatives from ministries and/or funding organizations from the countries involved in ACTRIS. Once ACTRIS PPP commences, ACTRIS will also establish its advisory bodies: **Interim Scientific and Implementation Advisory Board** and **Interim Ethical Board** to support the work of the Interim ACTRIS Council and ACTRIS PPP.

ACTRIS PPP will aim at obtaining consensus agreement between stakeholders or their representatives. ACTRIS will be prepared to conclude an interim Memorandum of Understanding in the situation that the implementation of the chosen legal structure lasts longer than the preparatory phase. A signature-ready document on the proposed statutes of the legal entity will be provided at the end of the project.

ACTRIS has proposed a funding model as described in the ESFRI proposal. Within this PPP (WP3), the funding model will be further explored and in-depth analysis of the costs of the RI will be made. The ACTRIS financial framework will contain principles for hosting country contributions to the Central Facilities, country-level membership fees to ACTRIS, and user and access fees. It is proposed that ACTRIS Central Facilities, including Head Office, should be funded at a minimum of 20% centrally from ACTRIS membership fees and a maximum of 80% nationally by the host country. After careful evaluation, the funding principles of ACTRIS will need to be agreed on by the Interim ACTRIS Council.

ACTRIS PPP will initiate its work based on the current organization of ACTRIS and on the funding and service principles detailed in the ACTRIS ESFRI application. It is the goal of ACTRIS PPP to further elaborate and adjust as necessary these initial principles following the evolving requirements from ACTRIS operators and the negotiations between ACTRIS Members.

ACTRIS PPP maintains a dialog with stakeholders and the national ACTRIS Consortia. National Consortia secure national funding for upgrading the national research facilities to be ACTRIS compliant, and promote ACTRIS activities in their own country. In addition, National ACTRIS Consortia organize the coordination and the ACTRIS community at the national level, and ensure proper dissemination and information flow from European ACTRIS activities to the national science communities and to the relevant national and regional or local stakeholders. To achieve its objectives, the three-year project is divided into three main themes (see details below), described in nine work packages, running in parallel. The work package structure of ACTRIS PPP is presented in Figures 4 and 5.

Activities towards the implementation of ACTRIS PPP

The methodology of ACTRIS PPP is divided into 3 major building blocks (themes): 1) Organizational, 2) Operational and, 3) Strategic

1. ***Organizational framework***

   The first theme addresses the organizational framework of ACTRIS with the aim of creating the governance structure for both management level (Head Office) and decision maker level (establishing the Interim Council and other Interim bodies). This theme also includes establishing the legal framework and drafting the ACTRIS statutes, and preparing the financial figures for the 5-year initial operational period of ACTRIS. A solid ACTRIS Business plan will be also established with input from all the themes (1-3) and WPs in the close dialog with the National ACTRIS consortia and ACTRIS members.

2. ***Operational framework***

   The second theme, the operational framework, will establish the processes for defining the concepts of each Central Facility and the National Facility requirements, selecting the Central Facility service providers, and labelling the National Facilities. It also includes the processes for defining the rules and modalities for accessing ACTRIS services.

3. ***Strategic work***

   The third theme, the strategic work, targets the long-term planning of ACTRIS for 30 years following the start of its operation. This includes strengthening the participation in ACTRIS via potential new member countries and implementation of new technologies and services together with the preparation of additional Central Facilities (e.g., for remote sensing of trace gases). The strategic work also includes liaison activities among ACTRIS, other research communities, and diverse user groups. A thorough analysis of the socio-economic impact of ACTRIS will be made.

Overall timeline for implementation of the ACTRIS research infrastructure

The planning of the RI implementation has already started with ACTRIS-2 and during the preparations for the ESFRI roadmap application. The ESFRI roadmap status enables the work process for planning and construction. The planned **ACTRIS implementation phase** includes planning and construction phases. The ACTRIS research infrastructure is estimated to be pre-operational in 2021 and fully operational in 2025. These phases are together termed the **ACTRIS operational phase**. Figure 3 illustrates the different phases of ACTRIS on the timeline towards fully operational services. ACTRIS aims to be operational for more than 20 years after the initiation of the operational phase, from 2025 – 2045 (and beyond).

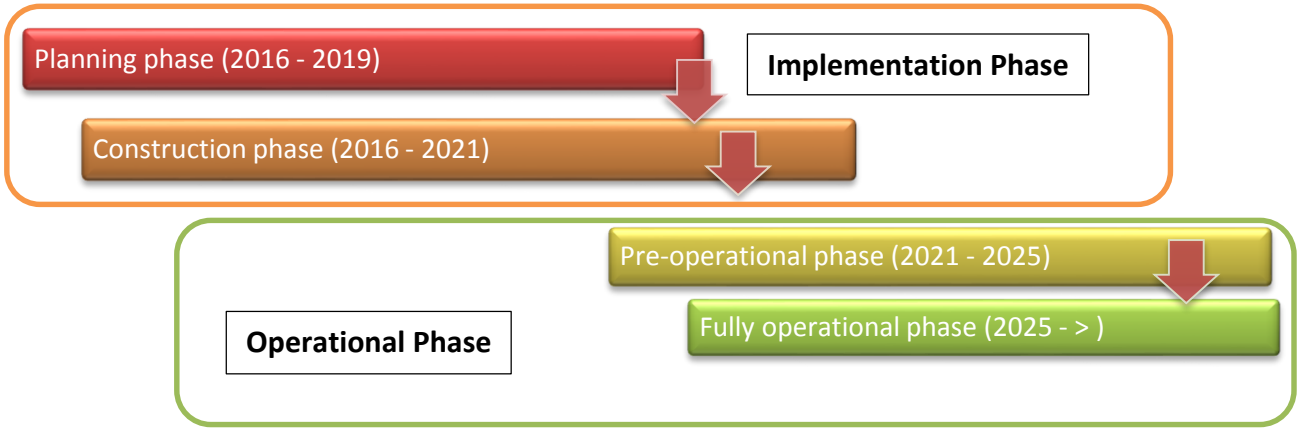


***Figure 3**. ACTRIS implementation timeline outlining phases on the path to fully operational ACTRIS services.*

Planning phase (ongoing until 2019)
This phase includes ACTRIS PPP actions. The most important activities during the planning phase are:

- Finalizing the ACTRIS National Facility requirements and starting the labelling of the individual national facilities as ACTRIS National Facilities;
- Finalization of Central Facility concept papers and evaluation of the proposals for the multinational Central Facility for final siting selection;
- Finalizing the ACTRIS service provision accounting for user needs (incl. data management, ACTRIS access, and data policy protocols);
- Establishing the interim phase governance bodies to finalize and decide on the ACTRIS legal model and to agree on the ACTRIS funding model, and establishing the ACTRIS financial plan for the first years of operations;
- Selection of the key personnel for the research infrastructure, including the Director General.

Construction phase (on-going until 2021)
Parallel to European-level planning, the national-level construction of the ACTRIS National Facilities continues. The construction is based on the technical requirements originating from the ACTRIS-I3 and ACTRIS-IA projects and on the protocols and methodologies agreed on during ACTRIS PPP. Formal decisions on the Central Facility locations (siting) and hosting organizations as well as initial testing of the services will be made within ACTRIS PPP. The testing phase still allows modifications or corrections to operational performance, and adjustments of the research infrastructure management design, to achieve the optimal level. Specific user analysis, use cases, and user training activities will be organized to optimize the services for various user groups. During the implementation phase, the construction of the long-term management and monitoring systems will be established in parallel.

The final aim is to have the ACTRIS statutes and the constitutional documents signature-ready by the end of ACTRIS PPP in 2019, with a target for establishing ACTRIS as a legal entity in 2020/21.

Pre-operational phase (2021-2025) and fully operational phase (2025 – 2045 and beyond)
After the establishment of the ACTRIS legal entity, the official operations and service provisions for users will start. The ACTRIS research infrastructure services will be operated according to the agreed ACTRIS governance structure and according to the ACTRIS Financial Plan and annual activity plan.

Progressively during the pre-operation phase in 2021-2025, the ACTRIS research infrastructure will ramp up to its full service provision and data distribution capacity. This will be accomplished once the National Facility labelling

process is finalised and the expected new ACTRIS members are included in the research infrastructure operations and in the governance structure. The ACTRIS research infrastructure will enter the fully operational phase after the five-year pre-operational phase, and is estimated to last at least 20 years. During this long period, a number of assessments and foresight studies will be made. The agility of operations and management is one of the main objectives allowing the novel research infrastructure environment, high-quality user services, and long-term funding to be sustained.

Supporting programs for ACTRIS PPP

ACTRIS PPP will facilitate the establishment of ACTRIS as a pan-European sustainable RI. ACTRIS PPP is obviously strongly connected to the ACTRIS-2 project but also strongly relies upon ACTRIS activities undertaken at a national level. National ACTRIS organizations are already in place in many participating countries and ACTRIS PPP will establish the official links to ensure efficient transfer of information.

ACTRIS is a member of the ENVRI (Environmental Research Infrastructure) cluster and represented in the H2020-ENVRI^{plus} project (envri.eu) by several of its partners (or associate partners). ACTRIS PPP will benefit from the outcome of several ENVRI activities on the common solutions for RI operations, draft strategies and policies, and the sharing of best practices and knowledge. For the specific establishment of the legal entity, ACTRIS PPP will benefit from experience of the partners in the preparatory work of ICOS, IAGOS, EPOS, EURO-ARGO and more. ACTRIS PPP will also benefit from ENVRI when defining its operational links with SMEs and innovation policies. It will also benefit from ENVRI for defining the level of common operations with other RIs in the atmospheric domain; in particular, EUFAR for airborne platforms, and ARISE for atmospheric dynamics components.

ACTRIS PPP is strongly connected to EUROCHAMP, with many partners (or associated partners) in ACTRIS operating EUROCHAMP simulation chambers, and are potential partners in the EUROCHAMP-2020 (Integration of European Simulation Chambers for Investigating Atmospheric Processes–towards 2020 and beyond) project, submitted to 2020-INFRAIA-2016-2017. The integration of simulation chambers as National Facilities and the connected activities for the definition of access policies (virtual access and physical access) will be elaborated jointly with the extended EUROCHAMP communities.

The general concept and methodology of ACTRIS PPP are facilitated by the links already established with user communities; in particular with the AEROCOM project, in the frameworks of Copernicus and EUMETNET (European Meteorological Services Network), with Space Agencies (EUMETNET, ESA) programs, and with European institutions such as EEA.

Gender analysis and support measures during ACTRIS PPP

Equality and gender balance are promoted via the ACTRIS PPP leadership and ACTRIS community. ACTRIS PPP is coordinated by a female (coordinator) and male (co-coordinator), and six out of the nine project work packages are led by females. About 67% of the principal personnel participating in the project (listed in Section 4) are male and 33% female. Taking into account the existing relative unbiased gender representation in the field of physics in general, ACTRIS stands out as an excellent example of a well-balanced working community. Moreover, in ACTRIS PPP the coordination, especially the technical and financial aspects, is led by women. Equality and gender balance will also be maintained in the future; the ACTRIS human resource strategy to be developed within the PPP will implement actions to meet equality and gender-balanced employment targets. In addition, ACTRIS is acting as a role model and can facilitate mentoring and networking opportunities for both genders. With an overall gender balance achieved in ACTRIS, the context of ACTRIS activities (in planning, construction and in operations) will include balanced gender perspectives.

2. Impact

ACTRIS PPP will provide a key contribution for establishing ACTRIS as a long-term operational research infrastructure and to enable services for generating and disseminating knowledge, boost technological development, create human capital and jobs for the benefit of society, and to tackle environmental challenges.

The building of ACTRIS has multiple benefits for numerous user communities listed below.

ACTRIS benefits scientists via: quality-assured and open-access ACTRIS data; standardized operating procedures; instrument and procedure intercomparisons; access to research platforms for conducting excellent research and creating new scientific knowledge; enhancement of research performance due to centralized access to ACTRIS data

and specific services; increased possibilities for international collaboration, large-scale research projects and training opportunities; and technical support from CFs and on-site support from NFs.

ACTRIS benefits policy makers by providing support for: policy-driven networks established under EU-directives (local and European air-quality networks); development of new policies by provision of novel tools for validating the impact of regulation strategies and emission abatement policies through direct evaluation of atmospheric trends at regional / European scale; decision-making regarding environmental issues by provision of high-quality and long-term data for predicting climate scenarios from local and regional up to national and international level; atmospheric hazard (e.g. volcanic eruptions) management and risk mitigation via the knowledge base of ACTRIS expert teams and monitoring of extreme atmospheric events; and enhancing job creation indirectly (expert jobs, new business opportunities).

ACTRIS benefits the private sector via: open-access data; expert services and physical access to the infrastructure for innovative research for the development of novel technologies and products and as a test bed for new technologies and instruments; development of quality assurance standards to support the technological development; and novel public-private collaborations leading to the establishment of spin-off and start-up companies.

ACTRIS benefits ministries and funding organizations by: optimization of national investments in research infrastructures; providing better value for money via pan-European dimension and coordinated access to data and services; and by the establishment of a unique research infrastructure for atmospheric sciences within Europe to improve efficiency of operation and coordination among the European research institutions avoiding the duplication and fragmentation of research efforts.

ACTRIS benefits educators by offering training, exchange programmes and knowledge transfer, e.g. basic and advanced international courses on atmospheric composition and processes for Master's and PhD students; providing educational material; and offering expertise (e.g. expert visitors to schools of all levels).

ACTRIS benefit to Civil Society (e.g. general public, national and international media) arises from improved weather, climate and air quality predictions due to novel scientific findings resulting from ACTRIS; enhanced awareness on the environmental challenges that society is facing, e.g., climate change and air quality issues; and promotion of dialogue between researchers and society to translate scientific knowledge into practical applications.

2.1 Expected impacts

The aim of ACTRIS PPP is to bring ACTRIS to the level of legal, financial, and technical maturity required for implementation as a long term research infrastructure. This means that ACTRIS can achieve operational readiness and deliver the planned services. Thus, ACTRIS PPP is not only ambitious but also crucial for the implementation of ACTRIS. Once ACTRIS is operational, it will have multiple impacts and leverage effects on the development of the European technological capacity and effectiveness scientific discovery, innovation, and competitiveness in the field of atmospheric sciences, and contributions to the European Research Areas (ERA). ACTRIS PPP will ensure the involvement of all relevant stakeholders in its implementation and it is a strategic step towards establishing of ACTRIS in the following respects:

1) Strengthening the technological development capacity, effectiveness, scientific performance, efficiency and attractiveness of the European Research Area

Enhancing scientific performance, efficiency and attractiveness of the ERA: During the PPP, ACTRIS will develop the access principles to ensure effective access to ACTRIS data and services for all potential user groups via a single entry point. Via the centralized access management unit (SAMU) and Data Portal, ACTRIS research services will be easy to access and will reduce the technical and administrative burden for researchers. The availability of high quality-controlled data and the extensive set of services offered by ACTRIS will allow researchers to concentrate on advancing scientific and technological developments. In addition, ACTRIS Calibration Centres will provide coordinated instrument calibration and linked technical services and expertise for researchers, research organizations and other user groups. With these centralized RI functions, ACTRIS will increase the effectiveness of national research communities. ACTRIS will also increase and optimize transnational co-operation and competition by allowing pooling of national resources areas in different countries, thereby avoid overlapping investments in research. This will also ensure research groups around Europe can focus on novel research directions and effectively provide new scientific and technological insights.

Target indicators:

- *Amount of services provided to the scientific community*

- *Number of scientific users*
- *Number of peer-reviewed articles related to infrastructure, i.e. using the ACTRIS data and RI services;*
- *Number of research contracts granted*
- *Number of theses (Master's and PhD) using ACTRIS data or ACTRIS National Facilities and Central Facilities*

Strengthening partnership in ERA and Worldwide: ACTRIS provides unique data sets not covered by any other European RI, and thus complements the focus area of ICOS (greenhouse gases) with the provision of information on short-lived pollutants including short-lived climate forcers and of IAGOS by adding the required continuity of the time series, and spatially, by offering 4-D information across Europe on parameters measured by both RIs. ACTRIS has links with other ENVRIs, such as SIOS, LTER, and ANAEE. ACTRIS PPP will define the proper level of interlinkages with ENVRIs and facilitate the establishment of shared activities and exchange of good practices and information. ACTRIS PPP will engage in the definition of the proper level of contractual agreements with the European and international networks that address atmospheric composition and related physical parameter observations. ACTRIS PPP will favour the establishment of ACTRIS-type observation systems in other World Regions particularly in countries where the capability to maintain high standards of observations, data and metadata is limited.

Target indicators:

- *Number of countries associated to ACTRIS*
- *Number of European and not-European users (virtual, physical and remote access)*
- *Number of contractual agreements with networks or organizations involved in monitoring atmospheric composition*
- *Number of personal trained at ACTRIS facilities from third-party countries*

2) Developing a sustainable RI landscape for acceleration of scientific discovery, innovation and competitiveness

Cross-fertilization of ACTRIS national initiatives: a large number of countries support the vision underlying the long-term integration plan of ACTRIS which represents globally more than 100 partners and associated partners in 21 countries. Establishing a shared organization and vision of needs and challenges for research in atmospheric sciences is unprecedented at a European level. ACTRIS PPP will support and promote national efforts to maintain National Facilities (laboratory facilities and observing facilities) and nodes of Central Facilities (data repositories, calibration centres) within an interlinked European framework. This will reduce fragmentation of national investments and promote harmonization of the European financial frameworks underpinning atmospheric sciences. National instrumental and monitoring programs constitute the core of ACTRIS investments. ACTRIS PPP, through an efficient harmonization of efforts, will strongly support maintaining the long-term operability of the National Facilities. It is foreseen, based on the level of funding commitments already received, that national governments will preserve their commitments to maintain and operate their existing infrastructures and that they will provide support at national level for further advances in harmonization during ACTRIS PPP.

Target indicators:

- *Number of countries involved in ACTRIS*
- *Number of research institutions involved in ACTRIS*
- *Number of pre-operational National Facilities fulfilling the requirements (personnel and technical)*
- *Number of pre-operational Central Facilities fulfilling the requirements (personnel and technical)*
- *Number of countries with an ACTRIS contractual agreement*

Fostering innovation potential in Europe: During ACTRIS PPP, ACTRIS will finalize the technical construction of the Central Facilities and the technical work required at a national level for establishing the ACTRIS National Facilities. ACTRIS provides a set of high-quality research and innovation platforms close to the local and regional private sector operators. The geographical closeness is particularly important for spin-offs, start-ups and SMEs. This promotes the knowledge and technology transfer locally and regionally ensuring the Europe-wide distribution of expertise. The construction of ACTRIS has already generated a multitude of collaborations with the private sector that have boosted - and will continue to boost - European technological capacity and effectiveness by establishing joint research and development activities, enhancing procurement opportunities for the private sector, and providing test-beds and innovation platforms for companies to develop their own products and extend their offer portfolios. Over recent years, ACTRIS has developed private sector collaboration with 80 companies in 14 European countries. This is expected to increase in the future as a result of specific actions during the PPP. The innovation potential is expanding regularly into industrial production applications that are expected to grow with the international air

pollution monitoring market. Observation technologies and methodologies, including hardware and software, in-situ and remote methods, are the fundamental building blocks of ACTRIS which brings together very strong technological expertise (micro- and nano-electronics, nanotechnologies, photonics, advanced materials, etc.) and gathers world-leading experts in the field of instrumentation for monitoring aerosol, cloud and trace gases. ACTRIS offers unprecedented potential in amassing the required critical mass of scientists and engineers to stimulate developments in the private sector by opening larger markets with respect to what is possible for individual partners, and influencing decisions in developing a common set of specifications and standards for sensors, instruments and methodologies.

Target indicators:

- *Number of private sector collaborations*
- *Number of physical access provided to private sector users*
- *Number of prototypes developed over a time period*
- *Number of novel instruments development*
- *Number of spin-off, start-ups and SMEs generated*

Establishing long-term e-ACTRIS requirements and downstream services: ACTRIS secures the provision and dissemination of a unique set of data and data-products that would not otherwise be available with the same level of quality and standardization. This results from more than 10 years of effort in constructing ACTRIS data provision capable of responding to community needs and requirements, and this work has been ongoing since the start of the FP5 EU commission program. The Central Facilities, particularly the ACTRIS Data Centre, are required to ensure that all data are treated and quality-controlled with similar procedures, properly archived for the long term, and accessible in a timely manner to all users. ACTRIS ensures compliance with reporting requirements (timing, format, traceability) defined by the major global observing networks. ACTRIS responds to the growing needs for reliable predictions of the evolution of the atmospheric environment, and focuses on research that enables a wide variety of products and services related to atmospheric composition. Atmospheric composition matters to climate, weather forecasting, human health, terrestrial ecosystems, and more, with understanding of the processes involved in controlling atmospheric composition essential in any prediction of the changing environment. ACTRIS provides international leadership in delivering integrated products and services. ACTRIS PPP will develop the collaboration and commitments towards users by enabling the downstream service developments, especially in regard to the Copernicus framework. Expected thematic application areas are linked to societal risks from climate change, high-impact weather and events, urban air pollution; and support conventions and treaties focused on sustainable development.

The full e-service environment developed in ACTRIS must be capable of evolving in response to a constantly changing demand from users. New tools will be required and are anticipated, making use of the most recent developments in information technologies. ACTRIS will build on new developments performed within the EU-funded ENVRI^{plus} project, adapting the RI reference model (ENVRI Reference Model) to its specific needs. Both data and information products derived from ACTRIS will be readily available at the desktops of the users, supporting new research and decision making alike. ACTRIS PPP addresses the future needs and, working jointly with ENVRI cluster, will anticipate future challenges and identify solutions in the European Open Science Cloud context for providing safe storage solutions and adequate computing capacity for data and service requirement over the coming decades.

Target indicators:

- *Volume of near real-time ACTRIS data available*
- *Number of services provided in the Copernicus framework*
- *Number of users of ACTRIS data products*
- *Number of provided web-based solutions and protocols for data distribution, data mining and data archiving, exchange and identification*
- *Number of provided tools for access to data assimilation, modelling and data visualization*
- *Number of new e-services provided*

3) Concluding the legal agreements necessary for the construction of ACTRIS

An efficient governance of the European RI for atmospheric research: ACTRIS PPP is an essential step toward the realization of the ACTRIS infrastructure and the transition from a project-based approach to a long-term RI organization. ACTRIS PPP brings together a wide community of research performing organizations, research funding organizations and ministries necessary for taking the decisions and actions required to move forward in the implementation of ACTRIS. ACTRIS PPP will establish and facilitate the work of ACTRIS members (countries) in the Interim ACTRIS Council. The Interim ACTRIS Council will take the decisions on the establishment of the long-

term governance and legal framework, and a sustainable funding model for the ACTRIS infrastructure. As described later in the work plan, all ACTRIS PPP activities are streamlined to feed appropriate information and documents for the Interim Council to make decisions on the selection of the ACTRIS CF locations, NF requirements and labelling, legal model, drafting of the legal statutes and performing a global cost analysis for the whole RI as well as defining the membership and access fees and the 5-year Financial Plan for the ACTRIS research infrastructure, and a long-term plan for the entire lifetime of the RI. During the PPP, feedback and continuous communication with ACTRIS stakeholders and funding agencies will be organised and facilitated so that legal, funding and policy documents are ready for final approval by ACTRIS members. The endorsement of an ACTRIS organizational model with a financial plan by national governments, research performing organization and funding agencies will be the major impact of ACTRIS PPP.

Target indicators:

- *Constitutional documents signatory-ready (incl. statutes and linked policy documents)*
- *Financial plan and internal financial rules defined and approved by the Interim ACTRIS Council*
- *Legal contract templates drafted for the Interim ACTRIS Council*
- *Number of policy documents defined and approved by the Interim ACTRIS council*
- *Approval by governments and funding agencies of the ACTRIS Business Plan*

There are no foreseen barriers, obstacles or regulations that would hinder or limit the expected impacts of the projects mentioned above.

2.2 Measures to maximise impact

a) Dissemination and exploitation of results

Target groups for ACTRIS comprise a wide range of communities including: (i) research communities world-wide in atmospheric science and related areas; (ii) national and international bodies with responsibility for the environment; (iii) policy-makers at the national and international level; (iv) private companies; (v) ministries and funding agencies; (vi) educators, and (vii) civil society.

The plan for dissemination of results and project outcomes obtained in ACTRIS PPP is designed to fully exploit the ACTRIS implementation and to reach out to all of the target audiences mentioned above. The plan for dissemination and exploitation of results relies on the successful engagement of ACTRIS users and other target audiences. **The ACTRIS dissemination strategy** will be fully developed during the initial period of PPP (M1-M6) within WP9 as part of planning ACTRIS PPP outreach activities in Task 9.5. The dissemination strategy will include: i) the description of the target ACTRIS audience (see the list above); ii) areas of dissemination actions and their expected impacts; iii) means of dissemination (electronic newsletter, promotional material, web pages, social media, scientific journals and other publications etc.); iv) identifying the measures to assess the user and stakeholder engagement, and v) definition of Key Performing Indicators for dissemination assessment.

The plan for dissemination and exploitation of the project results to the target groups capitalizes on ACTRIS and can be described as follows:

Data: The ACTRIS Central Facilities are required to ensure that all data are produced, treated and quality-controlled with specified procedures, properly archived for long-term usage, and accessible in a timely manner to all users through the ACTRIS Data Center.

Protocols and Methodologies: Many of the ACTRIS PPP partners hold key positions in the existing national and international framework (GAW, EMEP, GALION, etc..) and will convey the value of the project findings in the relevant policy arenas.. This is also true for transferring ACTRIS protocols to ISO/CEN standards with historical links between ACTRIS partners and Centres for metrology at national and EU levels (Centre Européen de Normalisation).

Meetings and workshops: Opportunities are advertised through the ACTRIS web portal.

Stakeholders and policy-makers: Stakeholders meetings are organized at both national and European levels.

International dimension: ACTRIS PPP partners are involved in the following scientific and policy national and international bodies and projects: WMO GAW including SAG-Aerosol, IGAC, IGBP, IPCC, EarthCARE Joint Mission Advisory Group, LRTAP UNECE Convention on Long Range Transboundary Air Pollution, HTAP UNECE Task Force on Hemispheric Air Pollution, COST Action ES0702, EG-CLIMET - European Ground-Based Observations of Essential Variables for Climate and Operational Meteorology.

Private sector: Although opportunities for SMEs are advertised through the ACTRIS web portal, this is clearly not sufficient. Further specific dissemination activities, including specific workshops and events, will be organized to promote the use of the infrastructure by the private sector in particular on open-access data; expert services

and physical access to the infrastructure for innovative research for the development of novel technologies and products and as a test bed for new technologies and instruments; development of quality assurance standards to support the technological development; and novel public-private collaborations leading to the establishment of spin-off and start-up companies.

Internal and external communication: Communication is implemented through the ACTRIS web portal. To foster diffusion of information towards the atmospheric community as a whole. A request is made to all partners either to use their institution web page to relay the information or to have a dedicated national ACTRIS web page. Other communication plans will include scientific publications, press releases, brochures, participation in international scientific conferences during the course of the project. We will regularly use opportunities offered by EU-publishers to explain and promote the role of the ACTRIS research infrastructure. We will consider use of new communications technologies (Twitter, Facebook, etc.) for all the above communication.

ACTRIS PPP will take part in the Open Research Data pilot with the goal of developing both a Data Management Plan and a Data Policy for the ACTRIS research infrastructure.

Preparations for developing an **ACTRIS Data Management Plan** have already started in the ACTRIS-2 IA project, however, ACTRIS PPP will refine and finalise the detailed description of the data life cycle and data flow systems for all NF and CF within ACTRIS (PPP WP4 to lead the work). It should be noted that ACTRIS PPP will not perform research itself, hence, no significant amounts of scientific data will be produced within the project. However, data curation and repository services, including data management and necessary development work on dataflow, workflow documentation and metadata issues, are handled by ACTRIS DC and all ACTRIS data and added-value data products are made available to the users via the ACTRIS data portal once the ACTRIS research infrastructure is operational.

Data generated / collected*:* ACTRIS NF and CF will produce vast amounts of quality-assured data and near-real-time data on atmospheric aerosols, trace gases and clouds (near surface, profiles / column data) that will be managed and distributed to the users via the ACTRIS DC.

Data Standards*:* ACTRIS will actively participate in international initiatives in the field of Earth observation and environmental research, working towards higher level frameworks to develop and improve standards for collecting and managing metadata and for making data fully interoperable at global scale. ACTRIS DC will develop and implement data and metadata protocols, and define and set quality standards for ACTRIS data (work to be done in PPP within WPs 4 and 5).

Data Availability*:* ACTRIS DC provides scientists and other user groups open access to all ACTRIS infrastructure data, complemented with access to innovative and mature data products and processing tools for QA, data analysis and research. ACTRIS follows the open research data initiative of the EC, making data discoverable (DOI identification), accessible (via open licence) and assessable (via necessary documentation and description). The ACTRIS metadata is also distributed and made available for European and global metadata search systems, such as GEOSS, improving the discoverability of the data sets to end users. ACTRIS PPP will determine a common, suitable data policy for the infrastructure, address issues on intellectual property rights (IPR) and focus on legally binding license systems to facilitate open data access. **The ACTRIS Data policy** will be drafted in WP2 and approved by the ACTRIS members in the Interim ACTRIS Council.

Data Processing Workflow, Curation and Preservation*:* ACTRIS PPP will elaborate a framework for documenting the data processing workflows used in the infrastructure, e.g. versioning of processing steps and algorithms used, including tracking of provenance. The ACTRIS DC collects and secures all ACTRIS primary data archived in three topical data repositories (aerosol profiles/column, near surface aerosol and trace-gases, cloud profiles). Access to data archived in the topic data bases and access to all aggregated data and higher-level data products will be provided via ACTRIS DC through a single access point, the ACTRIS data portal.

Knowledge management and protection strategy in ACTRIS PPP: the knowledge created within ACTRIS PPP aims at directly benefitting ACTRIS members and users. As a general statement, ACTRIS PPP follows the knowledge management and protection strategy of open access to the project outcomes to enhance knowledge creation in the establishment of ACTRIS research infrastructure. However, ACTRIS PPP will undertake measures to make sure that the intellectual property rights (IPRs) are respected for individual participants in the project's activities. The main IPR conditions and procedures will be established and described in detail in the Consortium Agreement (CA). The open access to project outcomes is only restricted on a case-to-case basis under specific IPR agreements which will be developed, in particular when joint ventures with SMEs are involved in the technical work. In the case of scientific publications, open access publishing, i.e. articles made publicly available for free immediately after publication ("gold" open access), will be favoured and all ACTRIS publications are expected follow this approach. In some special cases, for very strong reasons, open access to articles can be provided following an embargo period ("green" open access).

b) Communication activities

The ACTRIS PPP communication strategy embraces both internal (within the project) and external dissemination actions. **Internal communication** will be implemented through public web pages (building on the current ACTRIS web portal), by publicizing workshops and other relevant meetings; and making use of specific mailing lists developed for the specific activities (WP1-WP8). **External communication** outwards from ACTRIS PPP will be handled by ACTRIS PPP management (WP9) organizing and updating ACTRIS web pages, social media etc., and by WP7 which is responsible for the liaison activities with other relevant RIs, programmes and initiatives at the European and global level. The aim of the external communication is to timely disseminate ACTRIS PPP related material and information on the project progress to the users, stakeholders and other target groups. The outreach and dissemination activities will be directed not only to the countries within the consortium but will target various user groups (researchers in Europe and internationally, policy-makers, funding agencies, private sector, educators and civil society) through a broad range of communication activities. In general, the ACTRIS communication activities aim at promoting the awareness of ACTRIS, and full exploitation of its services in the long term. The ACTRIS PPP dissemination material will describe the ACTRIS implementation and process of towards an operational infrastructure, i.e., an ACTRIS stakeholder handbook and the **ACTRIS Business Plan** (Task 1.6), that will both be made available to all interested user groups. The dissemination of the promotional material will be performed via ACTRIS web pages, social media, at national and international scientific conferences, and other events. The objective of such communication activity is to keep ACTRIS stakeholders up-to-date on the progress of ACTRIS implementation and to increase the visibility of ACTRIS among potential users.

An important part of the RI communication activities will be performed in tasks 1.3 and 7.1. Task 1.3 ensures the proper level of collaboration and communication at the national and European level, continually reaching out for new members, and active communication to ministries and funding agencies. The main aims of this activity are to inform important bodies on the progress of ACTRIS implementation, and raise the awareness of ACTRIS among potential new members. Task 7.1 will facilitate the joint activities and formalize existing liaisons with European and global initiatives (including European RIs) within and outside of the atmospheric domain to ensure synergistic use of the networks and RIs. The objective of this communication activity is to contact every relevant RIs and networks, and ensure the appropriate level of ACTRIS service provision to them.

3. Implementation

3.1 Work plan – Work packages and deliverables

The overall structure of the work plan

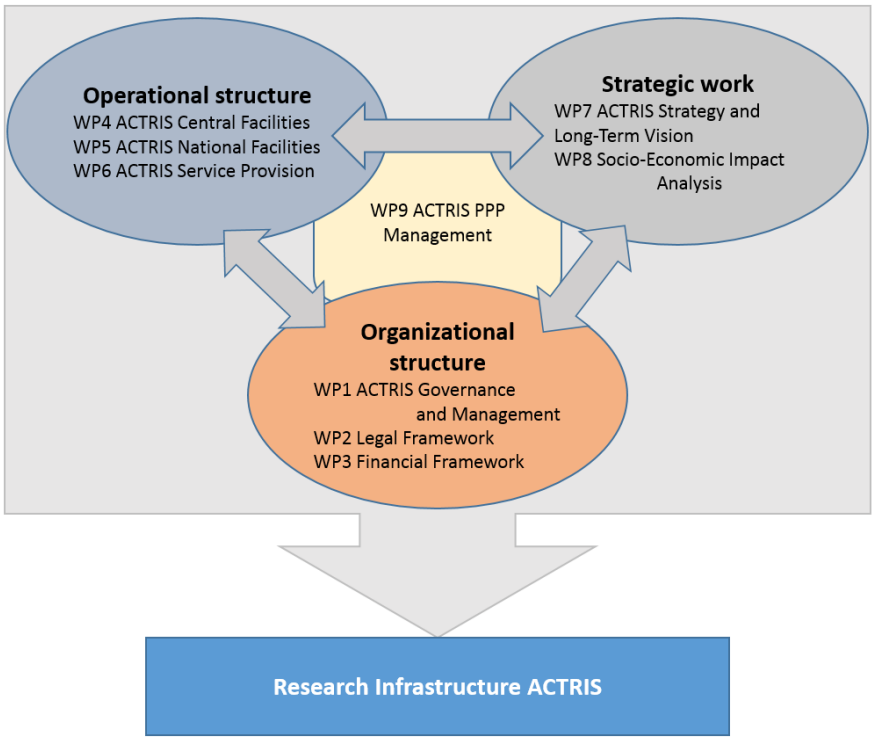
The ACTRIS Preparatory Phase Project is built upon three themes (as illustrated in Figure 4):

1. organizational framework,
2. operational framework,
3. strategic work.

1/ The organizational framework describes the research infrastructure of ACTRIS at an administrative level. It consists of the following work packages: ACTRIS Governance and Management (WP1), Legal framework (WP2), and Financial framework (WP3). The aim of these WPs is to establish a legal entity for ACTRIS and to create a sound funding and governance model, at both national and European scale. Here, with support from the ACTRIS community, together with ministries and funding agencies, the Interim ACTRIS Council will be created – the superior decision making body pending the establishment of ACTRIS as a legal entity. ACTRIS PPP will help and facilitate the work of the Interim Council.

2/ The operational framework pertains to the operational aspects of ACTRIS, and consists of three work packages: ACTRIS Central Facilities (WP4), ACTRIS National Facilities (WP5) and ACTRIS service provision (WP6). The three WPs together define the Central Facilities, National Facilities and their mutual role within the infrastructure. In addition, the data flow and access modalities will be constructed here. The aim is to have the full operational capacity of ACTRIS established by the time the legal entity is in place.

3/ The strategic work comprises Strategy (WP7) and the Socio-economic impact assessment (WP8). This includes the positioning of ACTRIS with respect to other research infrastructures, network projects and international co-operation activities within the environmental landscape. Service provision by ACTRIS to Copernicus, ESA and WMO will be handled. In addition, the strategic work will assess the effect of ACTRIS on society at geographical scales from local to European and global.



Finally the ACTRIS PPP management (WP9) will manage the other eight work packages and ensure high quality contributions in a timely manner and with. Note that WP9 focuses on the management of ACTRIS PPP, not on the management of ACTRIS as a research infrastructure.

These three themes are highly interconnected, with each theme having mutual dependencies on actions taken in another theme. Information from all themes is directed to WP1 (governance), where it is then collated and provided to the Interim ACTRIS Council for the final decisions on ACTRIS as a research infrastructure.

Figure 4 *illustrates the three themes of the ACTRIS Preparatory Phase Project: organizational, operational, and strategic work together with their associated work packages.*

Timeline for the work packages and their components

WP#	Task#	Description	M 1-3	M 4-6	M 7-9	M 10-12	M 13-15	M 16-18	M 19-21	M 22-24	M 25-27	M 28-30	M 31-33	M 34-36
WP1	1.1	ACTRIS governance and management structure												
	1.2	Facilitating the work of Interim ACTRIS Council and other ACTRIS bodies												
	1.3	Connecting national ACTRIS activities to ACTRIS PPP												
	1.4	Human resource strategy for ACTRIS												
	1.5	Risk management strategy and analysis												
	1.6	ACTRIS Business plan												
WP2	2.1	Legal entity analysis												
	2.2	Statutes drafting process												
	2.3	Contracts drafting process												
	2.4	Policy documents												
WP3	3.1	ACTRIS cost book												
	3.2	Funding model investigation												
	3.3	Financial plan												
WP4	4.1	Development of the concept for ACTRIS central facilities												
	4.2	Selection of hosting facilities												
	4.3	Testing of selected core services												
WP5	5.1	Technical concept and requirements for observational sites												
	5.2	Technical concept and requirements for exploratory platforms												
	5.3	Labelling of ACTRIS National Facilities												
WP6	6.1	Principles of access to data, products, and advanced digital tools												
	6.2	Principles of access to Calibration Facilities and National Facilities												
	6.3	Access cost analysis												
	6.4	Monitoring the implementation of access rules												
WP7	7.1	Links with European and global initiatives												
	7.2	ACTRIS service provision for COPERNICUS, ESA and European/International networks												
	7.3	Collaboration with private-sector												
	7.4	Identifying the future requirements of Atmospheric Research Infrastructures, incl. data and computational resources												
WP8	8.1	Defining KPIs and quantifying the direct effect of ACTRIS at consortium level												
	8.2	Developing methods to routinely monitor the indirect effect of ACTRIS from local to global scale												
	8.3	Quantifying ACTRIS effects on society as a whole - case studies												
WP9	9.1	Day-to-day management												
	9.2	Monitoring project progress and quality												
	9.3	Project meeting arrangements												
	9.4	Associate partnership program												
	9.5	Outreach activities												

Work Package 1

Work package number	1			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS Governance and Management						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	14	11	6	6	3	5	5
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:	1	2	1	3	1	1	1
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:			1	1		1	1
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:	1	1	1	1	1	2	1
Start month	1			**End month**			36

Objectives

The objectives of WP1 are to:

- establish governance and management structures for the ACTRIS research infrastructure;
- facilitate the work of the ACTRIS governance bodies to enable decision making and management of the ACTRIS implementation;
- coordinate and support the dialog between national ACTRIS activities and ACTRIS PPP;
- create an overall ACTRIS human resource strategy;
- establish a risk management strategy and systems for monitoring the implementation actions;
- integrate all WP2-WP8 outcomes that require the approval of the ACTRIS members (countries) to establish the ACTRIS legal entity, ACTRIS Business Plan, and run the ACTRIS operations.

WP1 will ensure the involvement of all stakeholders (including representatives from national or regional ministries and governments, research councils and funding agencies) in the ACTRIS implementation in order to progress with the ACTRIS PPP. Most crucial stakeholder actions are related to the decisions for establishing the ACTRIS legal entity, constructing the operational framework with all of the necessary components, and making the required financial commitments.

Description of work

WP1 will set up the governance and management structure, necessary bodies, and collect all documents necessary for establishing the ACTRIS legal entity, including readiness to advance to the pre-operational phase by the end of ACTRIS PPP. This WP produces the descriptions of the targeted governance and management structures and establishes the governance bodies (Task 1.1). The most important body to create is the Interim ACTRIS Council that acts as the highest decision body of ACTRIS. WP1 facilitates the work and meetings of all ACTRIS bodies, including the Interim ACTRIS Council (Task 1.2). WP1 readies meetings by collecting the necessary meeting materials and inputs from other Work Packages. WP1 also facilitates the communication and coordination of national-level ACTRIS progress and development (Task 1.3) to enhance participation and ensure constant communication with national stakeholders and ACTRIS service providers. As a part of the management of the ACTRIS implementation, WP1 will develop the required human resources for ACTRIS (Task 1.4) and run frequent risk analyses to ensure the smooth progress and prevention of major delays to and deviations from the implementation (Task 1.5). Ultimately, WP1 will integrate the output from all WPs in the ACTRIS business plan (Task 1.6).

Task 1.1 ACTRIS governance and management structure
Leader: FMI, Partners: UHEL, CNR, CNRS,

WP1 starts with refining the current description of the ACTRIS governance and management structures. The ACTRIS governance document will include the description of each ACTRIS body with an overall mandate, scope and initial terms of references. The ACTRIS governance and management structures will be defined both for the

ACTRIS implementation and for the pre-operational phase during M1-M3. Task 1.1 organises the establishment of the described bodies. The most important body to be established is the Interim ACTRIS Council. The aim is to have an operational Interim ACTRIS Council in M6. In addition, Task 1.1 also creates all foreseen supporting bodies, such as Interim Scientific and implementation Advisory Board, Ethical Board, and a User Forum. These will advise ACTRIS PPP and the Interim ACTRIS Council. Task 1.1 streamlines the management structure and establishes internal operational ACTRIS committees and working groups such as the ACTRIS Coordination Team, Interim RI Committee (with ACTRIS Central and National Facility representatives) and ACTRIS national Principal Investigator Assemblies. All bodies should be nominated before M12. In M30-M36, Task 1.1 will update the governance and underlying management structures (if required) for the ACTRIS pre-operational phase.

Task 1.2 Facilitating the work of Interim ACTRIS Council and other ACTRIS bodies
Leader: FMI, Partners: UHEL, CNR, CNRS

Task 1.2 ensures the involvement of all relevant ACTRIS PPP stakeholders in decision making. Task 1.2 facilitates ACTRIS governance bodies, including communication and dialogue between the members of the bodies, organising the regular meetings and preparing all the necessary materials for meetings. Task 1.2 ensures timely transmission of WP2-WP8 outcomes to decision making ACTRIS bodies, and to supporting bodies for enabling further work in ACTRIS PPP.

Task 1.3. Connecting national ACTRIS activities to ACTRIS PPP
Leader: UHEL, Partners: FMI, CNR, CNRS, INOE, CHMI, TROPOS, KIT, NOA, NILU, UPC, CSIC, UVA, UMAN, KNMI, PSI, CYI, IGF-PAS, ULund, BIRA-IASB, NUIG, EULS, AU, INRNE-BAS, JRC

ACTRIS is a highly distributed research infrastructure and most of ACTRIS services and operations are provided at national level. Hence, it is crucial that national activities and developments are connected within ACTRIS PPP to ensure that national activities are in-line with European level planning and implementation. Task 1.3 coordinates and supports the collaborative work at European and national level. In addition, it is important that ACTRIS continues to reach out for new ACTRIS members, ensure appropriate contacts and communication with ministries and decision-makers, and ensure that this activity is continuously reinforced. This effort further strengthens the ACTRIS consortia in its implementation.

Task 1.4. Human resource strategy for ACTRIS
Leader: UHEL, Partners: FMI, CNR, CNRS, INOE, UMAN

Task 1.4 defines the strategy and recruitment policy for the ACTRIS research infrastructure. ACTRIS human resource strategy and policy action includes defining the necessary human capital and skills required for the different positions within the ACTRIS research infrastructure. The strategy also outlines the training and education needs, and identifies potential training courses, staff exchange programmes and other opportunities for staff to enhance their skills. The ACTRIS human resource strategy also sets actions for meeting the equality and gender balanced employment targets. Once the legal entity for ACTRIS is approved, Task 1.4 will facilitate and coordinate the recruitment of staff for the ACTRIS legal entity.

Task 1.5. Risk management plan and analysis
Leader: FMI, Partners: UHEL, CNR, CNRS

The establishment of a large distributed research infrastructure requires explicit, mature plans and good communication and coordination with the member countries and participating research performing organisations. National and European level processes related to construction, financing, and creating operational structures and services need to be streamlined during ACTRIS PPP. Therefore, it is crucial to have a well-developed risk management strategy and carefully planned risk management and monitoring actions. Task 1.6 is responsible for providing the ACTRIS management plan and monitoring the potential risks during the planning and construction of the ACTRIS research infrastructure.

Task 1.6. ACTRIS business plan
Leader: FMI, Partners: UHEL, CNR, CNRS, INOE, TROPOS, UMAN

Task 1.6 gathers all the main deliverables and ACTRIS PPP outcomes into coherent information packages for the ACTRIS members and stakeholders. The plans and process towards the operational ACTRIS research infrastructure will be annually published for the stakeholders during ACTRIS PPP in the form of an ACTRIS Stakeholder's Handbook, which includes the descriptions of the current state of the ACTRIS implementation, the activity plans of ACTRIS facilities and services in each country, descriptions of Central Facilities with process reports, updated ACTRIS service descriptions, and the updated financial tables. The aim of Task 1.5 is to revise

regularly the stakeholder handbook with detailed RI information, aiming at converging towards an ACTRIS Business Plan for the operational phase at the end of the project (M36).
The ACTRIS Business plan will include descriptions of the ACTRIS strategic goals and socio-economic impacts; ACTRIS services and access provision; ACTRIS research infrastructure structure and governance; 5-year Financial Plan and long-term financial investment plan.

Deliverables

D1.1 Description of ACTRIS governance and management structures [M3[
D1.2 ACTRIS risk management plan for implementation phase [M6[
D1.3 1st ACTRIS Stakeholder's handbook [M12]
D1.4 Strategy for ACTRIS human resources [M18]
D1.5 2nd ACTRIS Stakeholder's handbook [M24]
D1.6 ACTRIS Business Plan [M36]

Work Package 2

Work package number	2			**Start Date or Starting Event**			Month 1
Work package title	Legal Framework						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	6	10	3	7	2		2
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:	2		1	1			1
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CYI	IGF PAS
Person/months per participant:			1				1
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives

The objectives of WP2 are to:

- explore legal models in order to find the best and most effective structure for the RI;
- draft founding documents for stakeholders to negotiate and agree on the establishment of a legal entity for the RI;
- draft and negotiate an agreement template and policy documents to integrate the distributed facilities into the RI.

Description of work

The overall target in this Work Package is to produce founding documents for a legal model, together with the documentation necessary to manage and run ACTRIS activities and integrate the national and multi-national facilities into a coherent European RI. WP2 will gather a combination of legal experts and scientists from participating organisations and the outcome is dependent on the results from other WPs, in particular WP1, 4, 5 and 6. Documents will be produced through interaction with, and the progress made, in these WPs. The document contents need to be negotiated with all relevant member countries and national research performing organisations in order to find a consensus. After establishing the Interim ACTRIS Council, the documents will be regularly discussed with this body to seek guidance for further iterations and for final approval.

Task. 2.1 Legal entity analysis

Leader UHEL, Partners: FMI, CNR, CNRS, KIT, IGF PAS

To function effectively, the activities of ACTRIS need to be managed properly and experience has shown that a legal entity is usually required. Since many studies and analyses have already been made to assess the most suitable legal model for pan-European research infrastructures, ACTRIS will build on previously gained knowledge and will utilise the results of these RI analyses. Considering the scope, size and complexity of ACTRIS, the legal model ERIC is a suitable starting point. In this legal model analysis, ACTRIS will also assess the various possibilities available for joint management solutions with other existing RIs, including the potential for synergies in cooperating closely with other environmental RIs, for example by using a common organizational framework. This task utilises different experts (scientists, legal advisers, managers) from among the ACTRIS PPP partners together with the output from WP7. The report on legal entity analysis will be provided to the Interim ACTRIS Council for discussion and to receive future direction.

Task 2.2 Statutes drafting process
Leader UHEL, Partners: FMI, CNR, CNRS, KIT, UPC

After the legal entity analysis has been performed and the Interim ACTRIS Council has discussed and decided what legal entity model to establish, the process of drafting the founding papers for the legal entity can start. Task 2.2 will draft the statutes and will facilitate the process of iteration among the ACTRIS PPP partners, national ACTRIS consortia and ACTRIS members. As the statute drafting process is an iterative process, the statute drafting will include many iterations and discussion rounds in the Interim ACTRIS Council. The final content of the documents is to be negotiated and decided by the ACTRIS members.

Task 2.3 Contracts drafting process
Leader UHEL, Partners: FMI, CNR, CNRS, INOE, TROPOS, KIT, NILU, KNMI

ACTRIS brings together more than one hundred independent legal entities from different European countries. These research performing organisations (RPOs) are in charge of the national level ACTRIS functions and moreover, some of them will form multi-national consortia to host and operate the Central Facility services. Thus, it is crucial that the national and multi-national ACTRIS operations have the correct legal and organisational links to the ACTRIS legal entity. The integration is performed through agreements. Task 2.3 will facilitate the work of drafting the contract templates for creating the contractual linkages between the ACTRIS legal entity and RPOs. The final formulation of the contract is very much dependent on the results from WP1, 4, 5 and 6, thus the drafting of the template will be performed close cooperation with the organisations involved in these WPs. The agreement template will be finalised in line with the progress made in other WPs. The content will also require negotiation between all participating organisations. After the first draft, a process of discussion and negotiation will be launched in order to find consensus. A process for final approval and agreement signing will also be explored and facilitated.

Task 2.4. Policy documents
Leader UHEL, Partners: FMI, CNR, CNRS, INOE, TROPOS, KIT, NILU, UMAN, KNMI

ACTRIS requires policies to guide its activities. One of the main activities in ACTRIS concerns data provision. The ACTRIS data policy document is based on the results of WP6 which will set access principles, and in WP4 which will produce the ACTRIS data management plan. The ACTRIS data policy will outline the basic principles for data acquisition, curation (compilation, archiving, and access), attribution, and data distribution and intellectual property rights. In addition, Task 2.4 will produce policy documents for ACTRIS access and service provision, ethical guidelines, staff rules. The policy documents will be drafted by the Task partners, with all ACTRIS national representatives. The interaction will be performed by the Interim ACTRIS Council to receive guidance for approval by the ACTRIS members.

Deliverables
D2.1 Legal entity analysis [M9]
D2.2 Ethical guidelines [M24]
D2.3 ACTRIS Data policy [M30]
D2.4 Document defining the founding articles for the legal entity [M32]
D2.5 Agreement template for integrating the distributed facilities [M32]
D2.6 ACTRIS access and service policy [M32]
D2.7 ACTRIS staff rules [M34]

Work Package 3

Work package number	3			**Start Date or Starting Event**			Month 1
Work package title	Financial Framework						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	2	3	20	7	1		3
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:			1	1		1	1
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:							1
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives

The objectives of WP3 are to:

- define the overall infrastructure construction and operation costs;
- assess financial models best suited for delivering the construction and operational needs of ACTRIS;
- develop policy recommendations on financial principles;
- establish the ACTRIS financial plan for the entire lifetime of ACTRIS.

Description of work

The main objective of this work package is to define a financial plan for the entire lifetime of ACTRIS; from the implementation phase to the operation. This will require three tasks:

- realization of a complete cost book of the RI, considering costs for NF, CF and service provision.
- investigation of a set of financial scenarios for the development and operation of ACTRIS, towards the definition of the ACTRIS financial contribution model to guarantee the financial sustainability of the RI.
- draft a long term financial plan to cover the entire lifetime of the RI by identifying the funding sources both at national and European levels.

Task 3.1 ACTRIS cost book

Leader: CNR, Partners: UHEL, CNRS,UVA

Here, starting from the work already done at national and European level, all of the RI costs will be defined. The necessary investment in terms of land, building and construction (when necessary), equipment, will all be considered. A complete analysis of ACTRIS costs will include all costs related to the RI services, human resources required for both research and management activities, and travel and other costs for the RI activities.

The costs will be defined starting on the technical work performed in WP 4, WP 5 and WP6 (starting from the requirements of each CF and NF, and the costs of related services).

This cost analysis will be the basis for the realization of a complete cost book of the RI considering costs for NF, CF and service provision for the entire RI lifetime (construction, operation, incremental developments, decommissioning or major upgrade).

Task 3.2 Funding model investigation

Leader: CNR, Partners: FMI, UHEL, CNRS, INOE, TROPOS, NILU, UMAN

Task 3.2 aims to design and test several funding models for defining the internal finance rules. This analysis will be devoted to identifying the most suitable financial structure and money flow for ensuring the RI financial sustainability during the operation phase.

Several scenarios will be investigated for the definition of all necessary parameters: national contributions, membership fees, additional user fees, in-kind contributions, host contributions.

Moreover, a financial analysis will be performed to determine the costs and potential revenues arising from the infrastructure over the reference period and to verify whether the projected cash flow ensures an

adequate operation of the infrastructure and its financial sustainability over the long term. This financial analysis will be used as input to the ACTRIS Business Plan developed in WP1.

Task 3.3 Financial plan
Leader: CNR, Partners: FMI, UHEL, CNRS, TROPOS, UPC, KNMI, IGF PAS

This task will establish a 5-year Financial Plan for the ACTRIS research infrastructure and a long-term plan for the entire lifetime of the RI, including decommissioning and/or major upgrades after the first operational phase. Input to the Financial Plan will come from Task 3.1, Task 3.2, from WP7 and WP8, and the Financial Plan will be discussed and iterated in close interaction with the Interim ACTRIS Council.

The Financial plan will be notably based on the complementarities between national and EU instruments (such as the European Structural and Investment Funds or the European Investment Bank). Moreover, attention will be paid to study new mechanisms, e.g. pre-commercial procurement processes, by which public authorities may develop new approaches to financing innovative solutions that can be a driver for the collaboration with the private sector.

Recommendations will be provided to the stakeholders in funding integration models.

Deliverables
D3.1 ACTRIS Costs Book (including CF, NF and services) [M24]
D3.2 ACTRIS Internal Financial rules [M32]
D3.3 5-year ACTRIS Financial plan, including stakeholder recommendation on financial integration [M34]

Work Package 4

Work package number	4			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS Central Facilities						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	3	3	9	10	10	6	5
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:	3		6			3	
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:		3	4		2	1	1
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives
The overall objective of WP4 is to design, establish and commence operation of the Central Facilities in ACTRIS; specifically to:

- conceptually design the ACTRIS Central Facilities with their commonalities and particularities;
- organize the selection of hosting institutions / nodes for ACTRIS Central Facilities;
- implement, exercise, and test the provision of core services.

Description of work

ACTRIS Central facilities, as foreseen now, consist of the Head Office, the Data Centre, and five calibration centres dedicated to specific methodologies and observation variables. The aim of these facilities is to provide services to the ACTRIS National Facilities as well as to external users:

- **ACTRIS Head Office** coordinates and manages the activities within ACTRIS, and acts as the external infrastructure contact point
- **ACTRIS Data Centre** compiles, archives and provides access to all ACTRIS primary measurement data, aggregated and advanced data products, analysis tools and services through the ACTRIS data portal.

- **Lidar Calibration Centre** offers services to characterize, test and calibrate lidars and ceilometers, and their parts, including training of the operators, and development of data quality control tools
- **AERONET-Europe Calibration Centre** offers services for: (1) calibration and standard maintenance of sun/sky/polarized/lunar CIMEL photometers, (2) quality-assured spectral Aerosol Optical Depth and radiances and their traceability, (3) calibration services to other commercial or research photometer, sky-imager and networks, (4) training
- **Near-surface Aerosol Calibration Centre** is responsible for the quality-assurance of physical, optical, and chemical in-situ aerosol measurements, and training of the operators
- **Near-surface Reactive Gases Calibration Centre** is in charge of the calibration and the quality-assurance for near-surface observations of reactive trace gases. This includes the support for the quantification of errors and promoting standardized methods.
- **Radar Calibration Centre** offers services for the absolute calibration of system parameters and radar observables, the quantification of errors, standardize radar calibration methods, and provide independent observations for validation and cross-checking.

The Central Facilities (CF) are connected to the ACTRIS observation sites and platforms (defined and labelled in WP5) enabling: a) traceability, quality control and quality assessment of the data and data products throughout the full data flow chain from instrument – raw data – processed data and its documentation; b) access to calibration services and innovative tools for data analysis and advanced research; c) data curation, access to all ACTRIS measurement, and advanced data products and data services, d) the efficient use of resources and planning. In order to design and build the complete CF architecture, WP4 is organized as follows:

Task 4.1 Development of the concept for ACTRIS Central Facilities
Leader: INOE, Partners: FMI, UHEL, CNR, CNRS, NILU, UVA, STFC, KNMIEMPA, ,

The concept will be developed from a detailed analysis of the current and near-future needs of the internal (ACTRIS national services providers) and external users, using the Delphi method and will address: (a) the nature of the services to be provided by each CF; (b) the principles, methodologies and procedures to be used; (c) requirements in terms of infrastructure and human resources.

A SWOT (Strengths, Weaknesses Opportunities, Threats) analysis and a foresight study for a 5-year time horizon (covering the pre-operational phase) will be realized to ensure an optimal CF sizing and architecture, considering the rapid development of the technologies and increasing number of users, user groups and application of data. A close collaboration with WP5 is necessary to quantify the NF needs as the primary users of CF services. The potential need for support from e-infrastructures for data management of large data volumes will also be analysed. Links to WP7 will facilitate a better estimation of requirements set by key stakeholders/customers such as ESA, Copernicus, EMEP, GAW, AERONET, NDACC, but also from potential users in the private and public sector (instrument developers, environmental monitoring, risk assessment, urban planning). Technical requirements for each of the Central Facilities will be established, in line with the type of services provided.

The concept will be sufficiently flexible to allow future adjustments (in view of the long-term operation), e.g. the setup of new CFs or major upgrades of existing ones, as identified in WP7. For each CF, the organizational structure will be discussed and proposed (output to WP1), and a thorough quantification of necessary capacities (material and human resources) will be made (output to WP3). Access protocols for internal and external users will be discussed (output to WP6).

Task 4.2 Selection of hosting facilities
Leader: CNR, Partners: UHEL, CNRS, INOE, TROPOS, KIT, NILU, UVA, STFC,KNMI, CYl, IGF PAS

Task 4.2 covers the elaboration of call documents and selection criteria, review and approval of applications for each CF. Definition of selection criteria will be made in line with the concept developed in Task 4.1. Key Performance Indicators for each CF will be set, covering the availability of the necessary laboratories, instruments, equipment, the required expertise of the human resources, and the capacity to provide specific services. Applicants will need to express their willingness and commitment for hosting a CF, and provide detailed information on existing capacities, experience on specific service provision, funding and other resources, and their operational plan.

The selection procedure is based on the IDRIS[1] definition of selection as a result of discussions. A panel of experts will make the selection based on the best possible option, taking into account the advantages (e.g., the

[1] Organisation for Economic Co-operation and Development (OECD), International Distributed Research Infrastructures: Issues and Options, Report 2014

provision of facilities and staff, financial advantages under national law) and disadvantages (e.g., low accessibility, difficulty in terms of employment policy funding plans and commitments) of the different potential hosts. The panel will involve representatives of the National Facilities to express the views and needs of ACTRIS observation sites, and external experts to express the views of users from outside ACTRIS.

Task 4.3 Testing of selected core services
Leader: KNMI, Partners: FMI, UHEL, CNR, CNRS, INOE, CHMI, TROPOS, KIT, NILU, UVA, STFC, EMPA

The functionality and operations of CFs and the quality of the services they provide will be tested through an internal exercise in the last year of the project. During the definition of the test objectives, an important activity is the identification of critical functionality parameters (time of reaction, number of requests solved, quality of the services, access to data, etc.) that have to be met by the CFs and establishing the pass/fail criteria. A parallel infusion of requests to all CFs will be organized, and the capacity of each CF will be monitored to properly address them. Compliance with the Key Performance Indicators defined in Task 4.2 will be checked. In case of weak performance, a key aspect is to identify the reasons, propose solutions for optimization and inform WP1 in its risk monitoring.

Deliverables
D4.1 Concept document on ACTRIS Central Facilities structure and services [M12]
D4.2 ACTRIS Data Management Plan [M18]
D4.3 Report on CF host selection process and outcome [M24]
D4.4 Report on functionality and performances of ACTRIS Central Facilities [M36]

Work Package 5

Work package number	5			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS National Facilities						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:		2	5	7	3	8	15
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:	3	2	2	4	1		
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:	3		2	2		3	3
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:	1	1	1	1	1	2	1
Start month	1			**End month**			36

Objectives
The overall objective of WP5 is to analyse the observation and exploration capabilities for the study of aerosols, clouds, and trace gases in ACTRIS, and to define the standards for the portion of the RI consisting of National Facilities. The specific objectives are to:

- elaborate the technical concepts and requirements for ACTRIS **observational** platforms;
- elaborate the technical concepts and requirements for ACTRIS **exploratory** platforms;
- support the selection of ACTRIS National Facilities and ACTRIS data by providing the labelling principles'

Description of work

ACTRIS comprises a widespread research infrastructure of observational and exploratory platforms for the study of atmospheric aerosols, clouds, trace gases, and their interaction processes. In previous ACTRIS projects, operating and quality standards at an instrument, algorithm, and product level for these facilities have been developed. This Work Package works on the synopsis, analysis, definition, and detailed documentation of the

ACTRIS standards for the observational and exploratory platforms. It will provide the labelling principles and will set the basis for the selection of ACTRIS National Facilities by the member states.

Task 5.1: Technical concept and requirements for observational platforms
Leader: TROPOS, Partners: UHEL, CNR, CNRS, INOE, CMHI, KIT, NOA, NILU, UPC, CSIC, NERC, KNMI, PSI, CYI, IGF PAS, ULund, BIRA-IASB, NUIG, EULS, AU, INRNE-BAS, JRC

This task is dedicated to the elaboration of technical concepts and requirements which shall apply to ACTRIS National Facilities for (a) aerosol profile and column observations, (b) cloud profile measurements, (c) trace-gas profile and column observations, (d) near-surface aerosol measurements, and e) near-surface trace-gas measurements. Quality criteria for instruments, algorithms, and data products will be defined in close collaboration with WP4. The ACTRIS Data Management Plan will define the framework for data delivery criteria. A detailed documentation of the requirements for the instrumentation of ACTRIS observational platforms, operation and data-evaluation procedures, products, and data delivery will be provided.

Task 5.2: Technical concept and requirements for exploratory platforms
Leader: TROPOS, Partners: CNRS, INOE, CHMI, KIT, UPC, CSIC, NERC, PSI, CYl

The objective of Task 5.2 is to elaborate the technical concepts and requirements for ACTRIS exploratory platforms, which include a) simulation chambers and b) mobile observation platforms. Exploratory platforms will supply excellent experimental capabilities and follow the ACTRIS quality standards for instruments and data products in connection with the Central Facilities (WP4). Scientific expertise will be provided to enable access and training activities at these sites. A detailed documentation of the requirements for the instrumentation, operation, and utilization of ACTRIS exploratory platforms will be provided.

Task 5.3: Labelling of ACTRIS National Facilities
Leader: TROPOS, Partners: UHEL, CNR, CNRS, INOE, CMHI, TROPOS, KIT, NILU, UPC, NERC, KNMI, CYl, IGF PAS, BIRA-IASB

Based on the output of Tasks 5.1 and 5.2, the procedures for the labelling of ACTRIS National Facilities and ACTRIS data will be established. The labelling principles and the labelling process will be defined. The selection of National Facilities is a national task. To facilitate this selection, ACTRIS labels will be deployed. For observational platforms, ACTRIS labels will be proposed depending on the level of observation synergy provided by the site and based on its geographical location. Exploratory platforms will be labelled with regards to instrumentation and exploration capabilities, scientific excellence, and access capacities. Principles for physical access to observational platforms and exploratory platforms will be established in close collaboration with WP6. Tests of the proposed services are intended. ACTRIS labels will also serve to provide cost estimates for National Facilities, which will be included in the cost book generated in WP3. A detailed documentation on labelling principles for ACTRIS National Facilities will be provided. The ACTRIS data label will be defined in collaboration with the ACTRIS Data Centre (WP4) and described in the Data Management Plan (D4.2).

Deliverables
D5.1: Documentation on technical concepts and requirements for ACTRIS **observational** platforms [M18]
D5.2: Documentation on technical concepts and requirements for ACTRIS **exploratory** platforms [M18]
D5.3: Documentation on ACTRIS National Facility labelling principles [M30]

Work Package 6

Work package number	6			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS Service Provision						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	4	1	8	9	3		1
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:		1	3		1	1	
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:	1	2			1	1	2
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives

The overall aim of WP6 is to define the ACTRIS access rules and establish the operational framework for service provision, contributing to the definition of coherent and harmonized data and access policies. The specific objectives are:

- to define the principles of access to the user services and service platforms via virtual, remote, and physical access, including the establishment of a single point of entry to ACTRIS services;
- to monitor the implementation of access rules.

Description of work

The ACTRIS distributed infrastructure will offer access to a wide range of services, products, and resources provided by the Central Facilities, i.e., Data Centre and Calibration Facilities, and by the National Facilities including observational and exploratory (fixed and mobile) platforms. The objectives of this work package are to explore the conditions and define the rules for access and access costs to implement an optimized, efficient, coordinated and centralized access process.

Task 6.1: Principles of access to data, products, and advanced digital tools
Leader: NILU, Participants: FMI, UHEL, CNR, CNRS, EMPA, CYI, IGF PAS

Through the Data Centre, ACTRIS will offer open and virtual access to harmonized and quality-controlled data, and advanced data products, tools, storage facilities and digital services. Based on information on user communities and on strategy, ACTRIS will define the conditions and rules for access, use, sharing and exploitation of data, taking into account issues related to legal conformity, intellectual property rights, licensing agreements, ethical and other aspects relevant at each stage of the data life cycle. This task will provide input to the ACTRIS Data Management Plan developed in WP4 and contribute to constructing a transparent and coherent ACTRIS data policy in WP2.

Task 6.2: Principles of access to Calibration Facilities and National Facilities
Leader: CNRS, Partners: FMI, UHEL, CNR, CNRS, INOE, TROPOS, NOA, CSIC, UVA, NERC, STFC, EMPA, IGF PAS, JRC

ACTRIS will provide physical or remote access to the Calibration Facilities, and physical access to a certain number of National Facilities, to a potentially increasing number of broad user communities beyond the conventional academic and current geographical boundaries. Based on information on user requirements and access capacities gathered in close cooperation with WP4 and WP5, the aim of this task is to define coherent access requirements and principles for harmonized access standards and practices, including access management and procedure (which will be implemented via the centralized Service and Access Management Unit), access modalities, review process, and aspects related to on-site user support, user rules, laws and safety regulations, ethical and risk considerations, intellectual property rights, commercial or other relevant issues. This task will contribute to the development of a consistent and coherent ACTRIS access policy.

Task 6.3 Access cost analysis
Leader: CNR, Partners: FMI, UHEL, CNRS, INOE, TROPOS, NILU, UVA, NERC, STFC

This task will analyse and define methodologies for calculating the costs related to user access and services. The assessment of access costs will be based on the identification of operational activities and boundaries, access capacities, user size and service requirements. Different methods for calculating coherent access unit costs will be investigated. User-dependent access fees adapted to different user types will be examined to manage the access of users from, e.g., the private sector, or for specific user services. The objective is to develop efficient user pricing schemes and to explore conditions for commercial exploitation through steering of investments to enhance RI cost effectiveness. The concept of access cost will be used in the ACTRIS funding model investigations within WP3.

Task 6.4 Monitoring the implementation of access rules
Leader: CNRS, Partners: FMI, CNR, INOE

The implementation and efficiency of the access rules and principles, defined in the previous tasks, will be monitored during the last year of the project. Quantifiable and qualitative indicators will be identified against which the ACTRIS service provision and impact will be assessed. Based on the quality of service provision in the testing phase, options for optimized future use and access will be explored during the implementation and construction phase to serve a wide range of evolving user communities in the operational phase. The outcomes of Task 6.4 will feed through to WP1 and WP2.

Deliverables
D6.1 Recommendations for ACTRIS data policy [M18]
D6.2 Report on access cost model and recommendations for pricing scheme related to access services [M22]
D6.3 Report on access rules and modalities and recommendations for ACTRIS access policy [M30]
D6.4 Report on the implementation and performance of service provision [M36]

Work Package 7

Work package number	7			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS Strategy and Long-Term Vision						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	2	8	2	5	2	4	1
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:		1	2	4			1
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:			1		1	1	3
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:	1	1	1	1	1	2	1
Start month	1			**End month**			36

Objectives

The overall aim of WP7 is to design a 30-year plan for the development of ACTRIS, embedding it within the current European and international landscape, and to define the conditions for maintaining a high and adaptable level of services in the medium to long term, after entering the pre-operational phase. To reach this goal, maintaining the involvement of user communities at a high level represents a strategic issue, together with continuously addressing the needs of stakeholders, at national, European and international levels. More specific objectives are to define:

- the required level of liaison with ERICs, particularly those in the Environment domain, with European / international institutions and networks such as WMO, ESA, Copernicus,, EMEP, AERONET;
- the required level of liaison with the private sector in ACTRIS;
- the conditions for integrating new observing technologies and for adapting to the new framework for data/computing management, in particular related to the European Open Science Cloud;
- the conditions for evolution of services in ACTRIS National and Central Facilities for responding to emerging needs of the scientific user community;
- the need for the governance of ACTRIS international activities, in particular with regard to third parties in emerging countries.

Description of work

The services provided by ACTRIS will remain optimally configured by responding to current and emerging scientific challenges related to air quality, climate and related areas. ACTRIS will account for the current and future landscape of the integrated Earth observing system to ensure that services provided remain unique, well-connected to user requirements, and embedded in national, European and international initiatives. The strategic framework will define the conditions for the effective evolution of ACTRIS, including its integration as a service provider for ESA, Copernicus, observing networks and modelling initiatives. Further, the strategy must be capable of responding to emerging challenges including the provision of enhanced services, the adoption of new technologies, and new opportunities provided by ICT, High Performance Computing and European initiatives (EGI, PRACE, European Open Science Cloud). To this end, the definition of the long-term ACTRIS technology and data integration strategy is a crucial element of the whole construction. The private sector represents one of the ACTRIS stakeholder categories and can be a user of ACTRIS facilities, of data and services, as well as a supplier to ACTRIS when they provide products and instrumentation used in Central Facilities. WP7 will define the most appropriate nature of the engagement between ACTRIS and the stakeholders in the private-sector, depending on roles and effective partnerships.WP7 constantly liaises with the legal, governance and financial work performed in WP1, 2, and 3, and accounts for the requirements for CF, NF and services defined in WP4, 5 and 6.

Task 7.1: Links with European and global initiatives, including European RIs and development of ACTRIS activities in emerging countries

Leader: UHEL, Partners: FMI, CNR, CNRS, NILU, UPC, IGF PAS, BIRA-IASB

The long-term embedding of ACTRIS within the European science arena is key to its development. Task 7.1 will facilitate joint activities with European RIs both within and outside of the atmospheric domain and, whenever possible, identify cost-effective options for synergistic RI use. ACTRIS provides unique data sets not covered by any other European RI, and thus complements ICOS (greenhouse gases) with the provision of information on short-lived pollutants, including short-lived climate forcers. ACTRIS also completes information provided by IAGOS both temporally, by adding the required continuity of the time series, and spatially, by offering information on parameters measured by both RIs. ACTRIS will also interact and guide SIOS to complement and ensure harmonised development of ACTRIS methodologies in the Arctic region. While liaisons with these RIs are already established, it is important that links are formalized with the implementation of a longer-term development strategy, addressing both national and European dimensions.

Task 7.1 will shape the joint strategy with Environmental RIs, with special focus on the atmospheric domain, and provide recommendations for the short to long-term evolution of this strategy. The optimal utilization of existing infrastructures together with strategic upgrades and implementation of pan-European shared resources is key for reaching these goals. Some ACTRIS partners are currently operating ACTRIS activities in emerging countries under bilateral agreement.

Because operations outside Europe are expected to increase in regions where there is a current lack of observations, in addition task 7.1 will provide recommendations for establishing the proper level of agreement for ACTRIS international activities. This includes considerations and responsibilities for capacity-building in the field of atmospheric science, contributing to harmonisation of measurements at a global level. Promoting the establishment of mobility programs with third-party countries will contribute to educational and training

activities. Finally, activities towards global observations will require that a clear relationship with international initiatives be established, in particular with GEO, WMO, and GCOS.

Task 7.2: ACTRIS service provision for Copernicus, ESA and European/International networks
Leader: UHEL, Partners: FMI, CNR, CNRS, INOE, NILU, UPC, KNMI, IGF PAS, BIRA-IASB

ACTRIS is expected to support policy-driven networks established to respond to EU-directives (local and European air-quality networks), to the Convention on Long Range Trans-boundary Air Pollution (CLRTAP) of the United Nations (Economic Commission for Europe - UNECE), or to the recent recommendation of Civil Aviation Authorities to improve the monitoring system for atmospheric hazards management. ACTRIS is clearly established as the research component of these policy-driven networks, with the fundamental role of providing calibration capabilities (reference instruments), contributing to technical improvements, and as a value-added system in case of environmental crises. ACTRIS is also an essential provider to ESA and national space agencies for ground-truthing of satellite-based remote sensing instruments and a key contributor to Copernicus Atmospheric and climate services. Contribution to these programs will require contractual agreements yet to be defined.

Task 7.2 will define the most suitable agreement level between ACTRIS and identified key stakeholders/customers such as ESA, Copernicus, EMEP, AERONET, NDACC, according to the level of specificity and the type of transaction. To reach such objectives, dedicated workshops will be organized inviting key representatives of the European and global initiatives together with national agencies, European agencies (EEA) and programs, to formulate informed opinions and feedbacks on the contractual agreement processes. Recommendation will be made to WPs 1, 2 and 3 for possible implementation and may include cost, time frame, secondment and contingencies.

Task 7.3: Collaboration with the private-sector
Leader: UHEL, Partners: CNR, CNRS, INOE, NOA

The private sector, including industry and small medium enterprises (SMEs), is a potential key stakeholder for ACTRIS. The engagement of private stakeholders will require specific scientific and financial issues to be addressed, together with legal and ethical issues depending on the level of cooperation (user of the ACTRIS facilities including Data Centre, supplier to the Central Facilities, or even (co-)developer of some of the ACTRIS services. The ACTRIS strategic plan for cooperating with the private sector will require, in task 7.3, addressing the specific roles of the private sector in the partnership and to define the most appropriate level of contractual agreement for full exploitation of ACTRIS services.

Task 7.4: Identifying the future requirements of Atmospheric Research Infrastructures, including data and computational resources
Leader: UHEL, Partners: FMI, CNR, CNRS, INOE, CHMI, TROPOS, NOA, NILU, UPC, CSIC, UMAN, KNMI, PSI, EMPA, CYI, IGF-PAS, ULund,, BIRA-IASB, NUIG, EULS, AU, INRNE-BAS, JRC
The understanding of atmospheric processes has evolved considerably over the last two decades. New challenges are expected to arise from responses of the Earth System to climatic and anthropogenic pressures. Responding to these emerging questions will most likely require the development of new approaches and methodologies that will have to integrate different fields of science, such as model forecasting and computational Earth science. ACTRIS must therefore develop an organization that will facilitate the timely adaptation of NF, CF and associated service provision to respond to future challenges. The vision is to identify critical missing components or technologies in national implementations and in European integrated infrastructure coverage with focus on the integration of different technologies.

The task is to maintain the European infrastructure at the most modern technological standards and methods, by ensuring the timely identification of promising new technologies, promoting their development and ensuring their widespread installation. Task 7.4 will define the conditions for establishing new CFs, considering the work developed in WP4, and for evolving NF technical requirements considering the work in WP5. Task 7.4 will engage the user communities to ensure that the RI as a whole remains optimally configured to respond to current and emerging scientific challenges and fully equipped for cross-disciplinary research. This task will address current and future needs for data and computational resources in ACTRIS and the options for promoting cost-effective sustainable and fully interoperable ICT services compatible with « FAIR » principles (Findable, Accessible, Interoperable, and Re-usable) and responding to the requirements of key stakeholder groups. ACTRIS will actively connect with environmental RIs and follow recommendations for European Open Science Cloud governance to be issued by current EU initiatives.

Deliverables

D 7.1 Recommendations for establishing level of contractual agreement with National, European, and global initiatives and programs [M30]

D7.2 ACTRIS strategic report from current status to 30-year vision [M30]

Work Package 8

Work package number	WP8			**Start Date or Starting Event**			Month 1
Work package title	Socio-Economic Impact Analysis						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:		1	4	2	2		
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:		11	1	2			
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:			1				
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives

The objectives of WP8 are to:

- analyse the socio-economic impacts associated with the development and operation of ACTRIS;
- define a set of Key Performance Indicators (KPIs) that will facilitate the effective monitoring and quantification of ACTRIS socio-economic impacts.

The analysis will take into account the impact of ACTRIS on society as a whole, via the RI contribution to increase the environmental information and support decision making processes. This includes the effects on research institutes, universities, companies, which are directly or indirectly involved in the implementation phase. Emphasis will be also given to the monetary valuation of these effects, facilitating the incorporation of ACTRIS into integrated cost-benefit analyses and thus fostering its inclusion in the decision making process chain.

Description of work

The development of ACTRIS is expected to create positive socio-economic effects through different impact pathways, specifically in the following categories:

- Knowledge creation; in research institutes, universities, companies, involved in the implementation of the project, through new knowledge, technological developments, patents, scientific publications, human capital enhancement;.
- Enhancement and improvement of products and services; whether outside the ACTRIS research community or not and for organizations that can utilize the environmental information provided by the RI in order to improve the input used for modelling and simulation approaches or to establish better inventories and data bases;
- Impact on society; as local authorities, environmental protection agencies, industries, ministries, international organizations, can utilize the environmental information provided by ACTRIS to optimize their environmental strategies and improve their decision making processes.

To define the appropriate KPIs to measure and quantify ACTRIS impacts in the aforementioned categories, WP8 will utilize surveys, interviews, and in-depth case study analyses. Through these instruments, WP8 will develop the appropriate methodologies to identify and evaluate the economic, scientific, and societal impact of ACTRIS both in the construction and the operational phase. WP8 outcomes will directly feed into the ACTRIS Business Plan (WP1).

Task 8.1 Defining KPIs and quantifying the direct effect of ACTRIS at consortium level
Leader: NOA, Partners: UHEL, CNR, CNRS, INOE

This task aims to define the appropriate KPIs and develop efficient methods for the quantification of the direct socio-economic impact of ACTRIS at the consortium level. For this, Task 8.1 aims to conduct an initial survey of the project participants. In particular, the questionnaire will be disseminated within the consortium in order to quantify and monitor the direct socio-economic impact of ACTRIS, e.g. through the investment and operation costs of atmospheric stations, generation and dissemination of knowledge, technological development, the creation of human capital, employment effects, the stimulation of local businesses, business opportunities related to innovation. Then, the appropriate KPIs will be defined based on the feedback received. Some of these indicators will be quantified not only in physical but also in monetary terms, through the use of appropriate multipliers, derived by national input – output tables and/or national/international databases.

Task 8.2 Developing methods to routinely monitor the indirect effect of ACTRIS from local to global scale
Leader: CNRS, Partners: CNR, INOE, NOA, UPC

Moving from local to regional and global scale, ACTRIS will offer access to state-of-the-art infrastructure and high quality services that will enable users to conduct excellent research. In the context of this task, mapping of the range of activities that benefit from ACTRIS outcomes and the relevant pathways will be performed. A targeted section will be included in the questionnaire under Task 8.1. After this mapping, Task 8.2 will conduct further surveys and interviews with users of the RI, ranging from local to global scale. The results will provide an overview of different impacts on research and society and form the basis for defining a second level of KPIs to address such multi-scale effects.

Task 8.3 Quantifying ACTRIS effects on society as a whole - case studies
Leader: CNR, Partners: CNRS, NOA, NILU, KNMI

ACTRIS will leverage far-reaching benefits, by providing support to local, regional, national and international authorities and organizations for: (i) monitoring air quality both at background level and in areas affected by high levels of air pollutants due to technological accidents, unfavourable meteorological conditions and natural phenomena (e.g., heat waves, volcanic eruptions, desert dust transport),.; (ii) increasing public awareness, knowledge and debate regarding air quality and the potential impacts on public health, environment and climate; and (iii) contributing to the strategic design of appropriate policies and measures in the short- and long-term for tackling the negative impacts of air pollution on society, with a view to maximising social welfare. The magnitude of these socio-economic effects may vary significantly and the impacts are site- and technology-specific.

In this task a number of case studies will be selected to give insight to the magnitude of the RI impacts and will assess the monetary contribution of ACTRIS. As an indicative example, the cost/benefit of environmental protection measures adopted, utilizing information derived by ACTRIS, will be compared with the costs and benefits of measures that would have been adopted if the detailed data of ACTRIS were not available to decision makers. In other words, the net costs of an ACTRIS scenario will be compared with the net costs of a reference scenario, where the environmental problem in question is treated without taking into account the analytical information provided by ACTRIS. Such analyses will include, to the extent possible, market and non-market goods, while monetization will be based on Benefits Transfer approaches, as well as existing studies evaluating the performance and effectiveness of the measures implemented. It is highly anticipated that these case studies will provide useful insights for adopting a generalized methodological framework to quantify/monetize the wider socio-effectiveness associated with ACTRIS. The selection of the case studies will be based upon both social and climatic criteria, with emphasis on sensitive European areas, such as the Mediterranean and the Arctic region. They will demonstrate the impact of ACTRIS effects on society and the results will be disseminated to all relevant stakeholders, especially in the impact areas.

Deliverables (brief description and month of delivery)
D8.1 Report on KPIs for the quantification of ACTRIS direct impact [M12]
D8.2 Report on methodologies for the quantification of ACTRIS multi-scale indirect impact [M24]
D8.3 Report on case studies for the socio-economic impact of ACTRIS [M34]

Work Package 9

Work package number	9			**Start Date or Starting Event**			Month 1
Work package title	ACTRIS PPP Management						
Participant number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Short name of participant	FMI	UHEL	CNR	CNRS	INOE	CHMI	TROPOS
Person/months per participant:	15	6					
Participant number	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Short name of participant	KIT	NOA	NILU	UPC	CSIC	UVA	UMAN
Person/months per participant:							
Participant number	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Short name of participant	NERC	STFC	KNMI	PSI	EMPA	CyI	IGF PAS
Person/months per participant:							
Participant number	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Short name of participant	ULund	BIRA-IASB	NUIG	EULS	AU	INRNE-BAS	JRC
Person/months per participant:							
Start month	1			**End month**			36

Objectives

This WP aims to complete the ACTRIS Preliminary Phase Project on time and within budget following the project deliverables together with securing the final project outcome: **an operational research infrastructure ACTRIS**. More specific objectives are to:

- ensure the smooth operation of ACTRIS Preliminary Phase Project;
- monitor the progress of the project;
- secure the flow of information among the different work packages and tasks, and between the project and the Commission;
- support the integration of the other eight WPs;
- organise the necessary external and internal dissemination and outreach activities.

Description of work

WP9 will ensure adequate coordination and management of all ACTRIS PPP Work Packages in administrative, scientific, technical, legal and financial matters. It will also ensure the day-to-day management tasks and communication between the scientific consortium partners, and between the scientific community and stakeholders. To perform this work, a Project Management Office (PMO) will be established.

Task 9.1. Day-to-day project management
Leader: FMI

This task will ensure that the contractual aspects of ACTRIS PPP are carried out on time. It will also be in charge of the day-to-day execution of management tasks in ACTRIS PPP, including (but not limited to) administrative, technical, scientific, financial and legal issues. The PMO is in charge of information flow and communication within the project, between ACTRIS PPP and ACTRIS-2 IA, between the scientific community and stakeholders, and towards the European Commission. The PMO will also prepare a Project data management plan for ACTRIS PPP.

Task 9.2. Monitoring of project progress and quality
Leader: FMI

PMO will supervise the progress of work and budget expenditure within the project. PMO will implement and exploit tools for monitoring the progress and budget expenditure in all WPs. The main purpose is to foresee potential risks due to delays or budget deviations in time so that adequate measures can be taken. PMO will also develop a quality control system within ACTRIS PPP through which all deliverables are vetted before they are delivered to the Commission.

Task 9.3. Project meeting arrangements
Leader: FMI, Partners: UHEL

PMO will be in charge of PPP related meetings during the project lifetime. This includes arranging the meeting venue and technical details, disseminating the meeting information, preparing the meeting agenda and drafting the meeting minutes. Besides facilitating the project meetings, the project management office will also support WP1 in facilitating the meetings of ACTRIS Interim Bodies.

Task 9.4. Associate partnership program
Leader: UHEL

ACTRIS involves many countries and research performing organisations (RPOs) and not all RPOs can be direct beneficiaries of PPP. Via the Associate Partnership programme, all RPOs that belong to a national ACTRIS consortium will be included in ACTRIS PPP activities. The Project Management Office will be responsible for managing and formalizing collaboration with partners other than ACTRIS PPP beneficiaries and linked third parties through the Associate Partnership program. This will performed in close collaboration with Task 1.3.

Task 9.5. Outreach activities
Leader: FMI, Partners: UHEL

ACTRIS PPP outreach is divided into two sub-tasks.

Sub-task 9.5.1. ACTRIS dissemination strategy and execution

The Project Management office will develop a dissemination and outreach strategy for ACTRIS. This will be prepared in close co-operation with ACTRIS-2 IA management so that general ACTRIS material, ACTRIS PPP materials and ACTRIS-2 IA materials can easily be identified. Material and information about ACTRIS and ACTRIS PPP will be disseminated to the scientific community, other user groups, to society at various events, in social media and through the ACTRIS web-pages. Information flow within the ACTRIS consortium and relationships to other RIs and networks are not included in this task, as they belong to Task 9.1 and WP7, respectively

Sub-task 9.5.2. ACTRIS web-pages

The PMO will be in charge of keeping ACTRIS PPP information up-to-date on ACTRIS web-pages, and of providing the necessary material for dissemination of ACTRIS PPP information about the roadmap towards an operational Research Infrastructure. ACTRIS web pages are hosted by NILU who will take responsibility for all technical aspects: access (both public and intranet), set up, implementation of technical features and functionality, organisation of access to ACTRIS national web pages etc.

Deliverables

D9.1 Meeting minutes of ACTRIS PPP kick-off meeting [M3]
D9.2 ACTRIS dissemination and outreach strategy [M6]
D9.3 ACTRIS PPP data management plan [M6]
D9.4 Meeting minutes of the first ACTRIS PPP annual meeting [M13]
D9.5 Meeting minutes of the second ACTRIS PPP annual meeting [M25]
D9.6 Meeting minutes of the last ACTRIS PPP meeting [M36]
D9.7 Summary report on the Associate partnership programme [36]

Table 3.1 b: List of work packages

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End month
WP1	ACTRIS Governance and Management	1	FMI	72	1	36
WP2	Legal Framework	2	UHEL	37	1	36
WP3	Financial Framework	3	CNR	41	1	36
WP4	ACTRIS Central Facilities	10	INOE	69	1	36
WP5	ACTRIS National Facilities	7	TROPOS	73	1	36
WP6	ACTRIS Service Provision	4	CNRS	39	1	36
WP7	ACTRIS Strategy and Long-Term Vision	2	UHEL	46	1	36
WP8	Socio-Economic Impact Analysis	9	NOA	24	1	36
WP9	ACTRIS PPP Management	1	FMI	21	1	36
				Total months 422 PM		

Table 3.1 c: List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery month
1.1	Description of ACTRIS governance and management structure	WP1	FMI	R	PU	3
1.2	ACTRIS risk management plan for implementation phase	WP1	FMI	R	PU	6
1.3	1st ACTRIS Stakeholder handbook	WP1	FMI	R	PU	12
1.4	Strategy for ACTRIS human resources	WP1	UHEL	R	PU	18
1.5	2nd ACTRIS Stakeholder handbook	WP1	FMI	R	PU	24
1.6	ACTRIS Business Plan	WP1	FMI	R	PU	36
2.1	Legal entity analysis	WP2	UHEL	R	PU	9
2.2	Ethical guidelines	WP2	UHEL	R	PU	24
2.3	ACTRIS Data policy	WP2	UHEL	R	PU	30
2.4	Document defining the founding articles for the legal entity	WP2	UHEL	R	PU	32
2.5	Agreement template for integrating the distributed facilities	WP2	UHEL	R	PU	32
2.6	ACTRIS access and service policy	WP2	UHEL	R	PU	32
2.7	ACTRIS staff rules	WP2	UHEL	R	PU	34
3.1	ACTRIS Costs Book (including CF, NF and services)	WP3	CNR	R	PU	24
3.2	ACTRIS internal financial rules	WP3	CNR	R	PU	32
3.3	5-year ACTRIS Financial plan, including stakeholder recommendation on financial integration	WP3	CNR	R	PU	34
4.1	Concept document on ACTRIS Central Facilities structure and services	WP4	INOE	R	PU	12

4.2	ACTRIS Data Management Plan	WP4	NILU	R	PU	18
4.3	Report on CF host selection process and outcome	WP4	CNR	R	PU	24
4.4	Report on functionality and performances of ACTRIS Central Facilities	WP4	KNMI	R	PU	36
5.1	Documentation on technical concepts and requirements for ACTRIS observational platforms	WP5	TROPOS	R	PU	18
5.2	Documentation on technical concepts and requirements for ACTRIS exploratory platforms	WP5	TROPOS	R	PU	18
5.3	Documentation on ACTRIS National Facility labelling principles	WP5	TROPOS	R	PU	30
6.1	Recommendations for ACTRIS data policy	WP6	NILU	R	PU	18
6.2	Report on access cost model and recommendations for pricing scheme related to access services	WP6	CNR	R	PU	22
6.3	Report on access rules and modalities and recommendations for ACTRIS access policy	WP6	CNRS	R	PU	30
6.4	Report on the implementation and performance of service provision	WP6	CNRS	R	PU	36
7.1	Recommendations for establishing level of contractual agreement with National, European, and global initiatives and programs	WP7	UHEL	R	PU	30
7.2	ACTRIS strategic report from current status to 30-year vision	WP7	UHEL	R	PU	30
8.1	Report on KPIs for the quantification of ACTRIS direct impact	WP8	NOA	R	PU	12
8.2	Report on methodologies for the quantification of ACTRIS multi-scale indirect impact	WP8	CNRS	R	PU	24
8.3	Report on case studies for the socio-economic impact of ACTRIS	WP8	CNR	R	PU	36
9.1	Meeting minutes of ACTRIS PPP kick-off meeting	WP9	FMI	R	PU	3
9.2	ACTRIS dissemination and outreach strategy	WP9	FMI	R	PU	6
9.3	ACTRIS PPP data management plan	WP9	FMI	R	PU	6
9.4	Meeting minutes of the first ACTRIS PPP annual meeting	WP9	FMI	R	PU	13
9.5	Meeting minutes of the second ACTRIS PPP annual meeting	WP9	FMI	R	PU	25
9.6	Meeting minutes of the last ACTRIS PPP meeting	WP9	FMI	R	PU	36
9.7	Summary report on the Associate partnership programme	WP9	UHEL	R	PU	36

The connections and the inter-related linkages of the ACTRIS WPs, national activities, Interim ACTRIS Council, ACTRIS service users, and main ACTRIS liaison partners are shown in Figure 5**.**

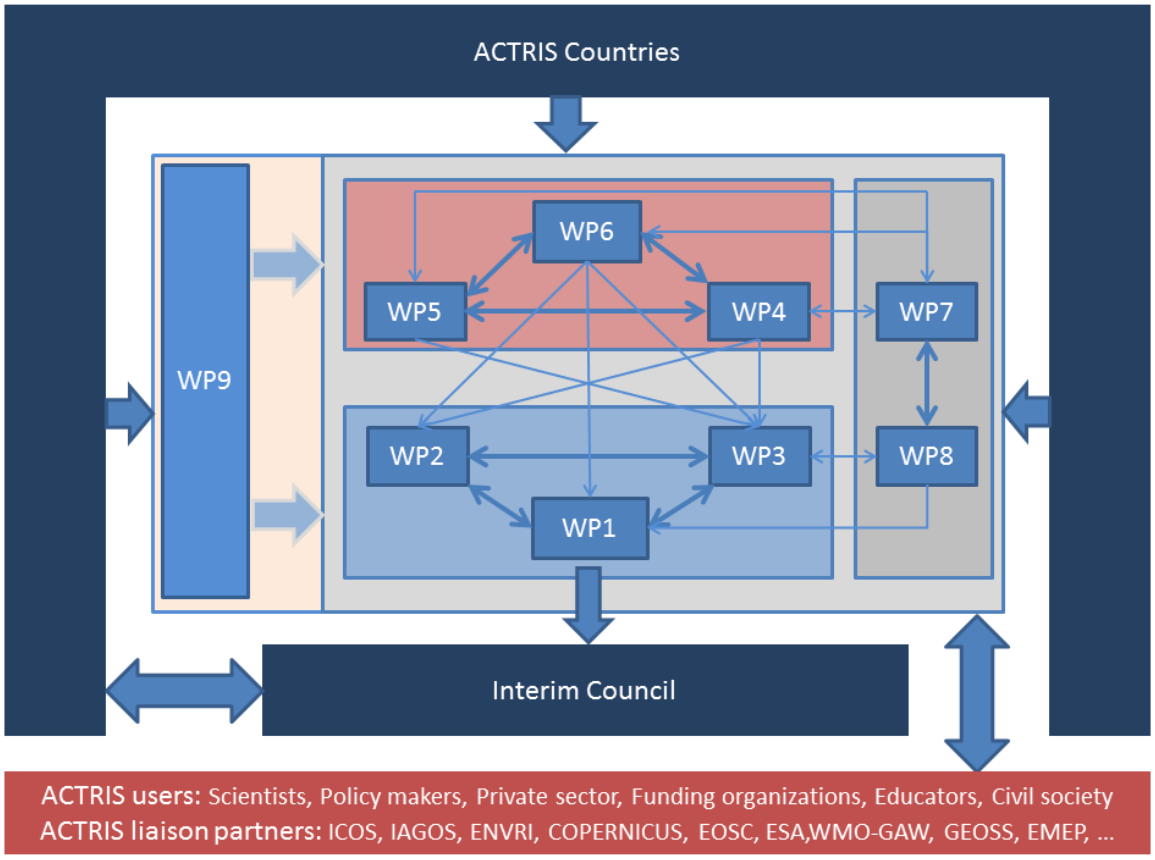


Figure 5. *Connections and the inter-related linkages of the ACTRIS WPs, national activities and Interim ACTRIS Council.*

3.2 Management structure and procedures

During the ACTRIS implementation phase, the governance structure and decision making bodies will be organised by the participating countries and supported by the science community to ensure an optimal and smooth transition from a project organisation to an interim structure, in the implementation phase, and finally to the governance structure of the ACTRIS legal entity. WP1 in ACTRIS PPP will be in charge of the overall organisation and facilitation of the ACTRIS research infrastructure governance that includes the establishment of the Interim ACTRIS Council of country members as the superior decision making body of ACTRIS in the implementation phase. The ACTRIS implementation phase governance structure also includes advisory bodies such as the external Interim Scientific and Implementation Advisory Board, and an Interim Ethical Board; and internal bodies and committees such as the ACTRIS RI committee and ACTRIS PI assemblies.

The ACTRIS Coordination team is responsible for the overall management of the ACTRIS research infrastructure activities during the ACTRIS implementation phase. The ACTRIS Coordination team includes the coordinators and co-coordinators of ACTRIS-2 and ACTRIS PPP, and the management offices of both projects. This arrangement will ensure the most cost-efficient, coordinated and complimentary implementation for ACTRIS.

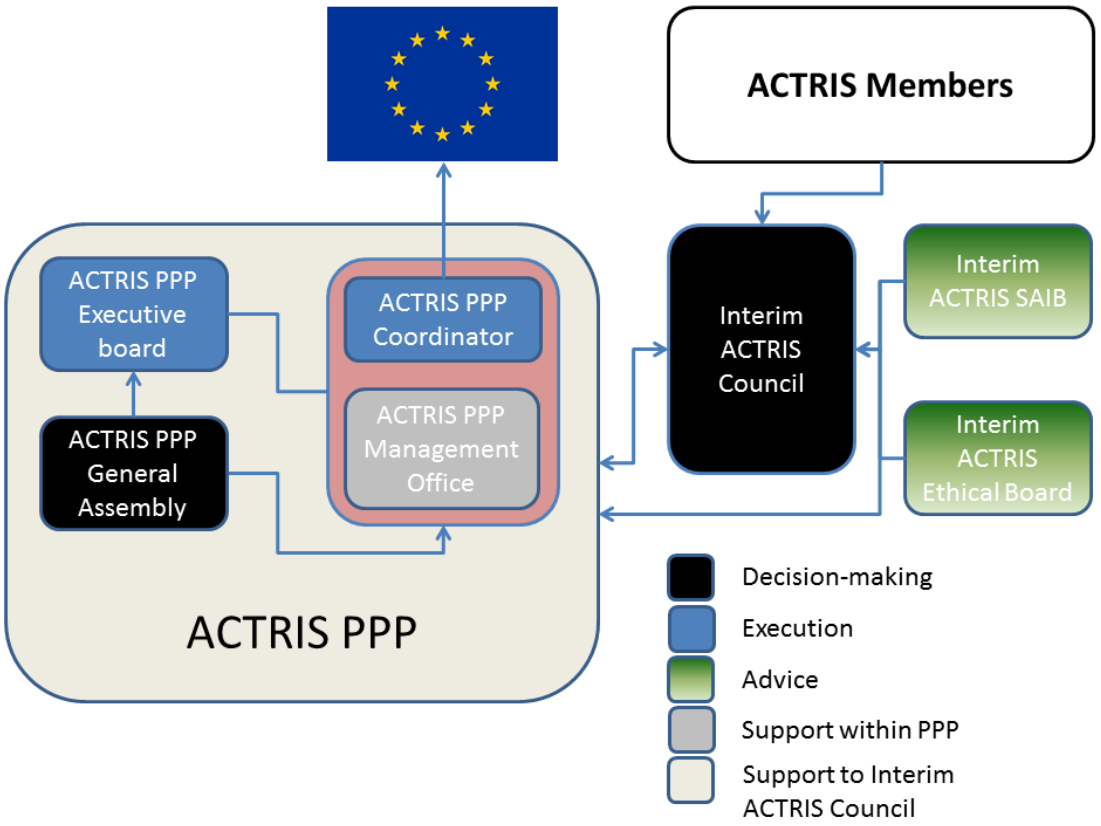


Figure 6. *The organizational structure of ACTRIS PPP and the interim bodies of the ACTRIS implementation phase. The colours indicate the role in the decision making and the arrows illustrate the connections and interlinkages between the various bodies.*

Organizational structure of the ACTRIS PPP

As ACTRIS PPP is an EC-funded coordination and support project, the project will have a standard European Commission project management structure to support the Preparatory Phase Project including the PPP General Assembly, Executive Board, Project Coordinator, Co-Coordinator, and Project Management Office. The ACTRIS PPP organizational structure complies with DESCA Horizon 2020 Model Consortium Agreement "Governance structure for Medium and Large Projects" (http://www.desca-2020.eu/).

The PPP General Assembly (GA) is the decision-making body of the Preparatory Phase Project *consortium* and deals with the issues related to the project – not deciding on the issues that requires decisions of the stakeholders (ACTRIS members in the Interim ACTRIS Council). It consists of one authorized representative of each Party (beneficiary). GA meetings will occur at least once per calendar year, co-incident with the project annual meeting. GA will be responsible for the content, finances and intellectual property rights of the project; appointment of the members of additional project bodies; and for preparing and amending the Consortium Agreement (CA).

The PPP Executive Board (EB) is the supervisory body for the execution of the project, which shall report to, and be accountable to, the GA. The EB consists of the Coordinator, Co-Coordinator, WP Leaders and Project Managers of ACTRIS PPP. The EB is responsible for the proper execution and implementation of GA decisions. EB monitors the effective and efficient implementation of the project. In the case of tasks abolished as a result of a GA decision, EB shall advise GA on ways to rearrange tasks and budgets of the Parties concerned, taking into consideration the legitimate commitments taken prior to the decisions.

Executive Board meetings are chaired by the Coordinator. EB will have meetings at least quarterly with one meeting in coordination with annual GA meetings, but will meet either in person or virtually when requested by two EB members. Details of the meeting, notice and agenda preparation will be defined in the CA. The Executive Board shall:

- prepare the meetings, propose decisions and prepare the agenda of the General Assembly;
- seek a consensus among the Parties;

- collect information at least every 6 months on the progress of the project, examine that information to assess the compliance of the project with the consortium plan and, if necessary, propose modifications of the consortium plan to the General Assembly;
- support the Coordinator in preparing meetings with the funding authority and in preparing related data and deliverables;
- prepare the content and timing of press releases and joint publications by the consortium or proposed by the funding authority;
- perform any other tasks specified in the Consortium Agreement or required by the General Assembly.

Project coordination of ACTRIS PPP is provided by partner 1 (FMI) together with partner 2 (UHEL). The ACTRIS **PPP coordinator** is Dr. Sanna Sorvari, Finnish Meteorological Institute and **co-coordinator** is Prof. Markku Kulmala, University of Helsinki. The ACTRIS PPP Coordinator represents the project consortium to the European Commission and ACTRIS member countries, and is in charge of the administrative, legal, and financial management of the PPP project and the overall ACTRIS research infrastructure implementation. In addition, the ACTRIS PPP Coordinator acts as the leader of the ACTRIS research infrastructure during the implementation phase.

The Coordinator and Co-Coordinator are supported by the **Project Management Office** and by **Project Managers** Dr. Niku Kivekäs, FMI, and Dr. Silja Häme, UHEL. The Coordinator, Co-Coordinator and Project Management Office are responsible for:

- monitoring that the actions, such as effective project management and execution of the decisions of GA, are implemented properly;
- representing the intermediary for communication between EC and the consortium, including transmitting documents and information connected with the PPP to relevant parties;
- ensuring the outreach beyond the consortium, for example with ACTRIS members, larger scientific community and other stakeholders;
- ensuring the ease of communication across the consortium for example by keeping the address list of Members and other contact persons updated and available;
- collecting, reviewing and submitting documents, information or deliverables required and verifying their completeness and correctness before submitting them on to EC or other parties;
- administering the financial contribution of EC and financial tasks, for example ensuring that all payments are made to the other beneficiaries without unjustified delay and informing EC of the payments
- chairing and organizing the GA and EB meetings and drafting the minutes;
- implementing an efficient project management and providing management in all administrative, legal, financial and scientific matters and also day-to-day management.

The Work Package Leaders are responsible for WP progress and their objectives. They also maintain communications inside the WP, present WP results in project meetings and report on WP progress to the PPP Coordinator and Coordination Team and, if needed, to GA. They are also responsible for providing WP deliverables on time and performing the initial quality control of WP deliverables.

The ACTRIS Coordination Team (including both ACTRIS PPP and ACTRIS-2 Coordinators, Co-Coordinators and Project Managers) together with WP4, WP5, WP6 and WP7 will ensure **the innovation management** of ACTRIS during the implementation phase. Activities such as foresight analysis of the Central Facility services (WP4), ACTRIS observation and exploratory platform development (WP5), service and access provision to industry (WP6) and long-term strategic collaboration with private sector (WP7), will enable the full innovation potential of ACTRIS and provide the readiness necessary for the whole consortium to respond to new openings, both external and internal innovation actions.

Table 3.2 a: List of milestones

Milestone number	Milestone name	Related WP(s)	Due date (in month)	Means of verification
1.1	Establishment of all interim ACTRIS governance bodies for implementation phase	WP1	12	Members nominated and constitutional meeting dates approved
1.2	Draft ACTRIS Business Plan	WP1	30	Distributed to PPP partners
2.1	Outline of legal entity analysis	WP2	3	Analysis report outline available
2.2	Workshop on relevant issues and outcomes from WP7	WP2	7	Workshop held
2.3	Legal entity analysis report	WP2	9	Report available
2.4	Draft of ethical guidelines and preparation of other documents for Tasks 2.3 and 2.4 started	WP2	12	Guidelines available
2.5	Draft of statutes and agreement template	WP2	16	Documents distributed to PPP partners
2.6	Draft data policy, access and service policy and staff policy	WP2	20	Draft policy documents available
2.7	Workshop on critical issues in documents	WP2	24	Workshop held
2.8	All documents ready for further discussions and decisions	WP2	32	Documents distributed to Interim ACTRIS Council
3.1	Draft version of the costs book	WP3	14	Draft document available
3.2	Draft version of internal financial rules	WP3	22	Draft document distributed
3.3	Draft version of the financial plan structure and principles	WP3	28	Draft documents available
4.1	Delphi survey	WP4	6	Survey announced to experts
4.2	Scenario workshop 1	WP4	6	Workshop held
4.3	Scenario workshop 2	WP4	9	Workshop held
4.4	Preliminary estimate of CF operation costs	WP4	10	Estimate document available
4.5	Call for applications for Central Facilities	WP4	18	Call published
4.5	CF functionality test	WP4	32	Test report available
5.1	Draft of documentation on technical concepts and requirements for ACTRIS observational platforms	WP5	12	Draft documents distributed
5.2	Draft of documentation on technical concepts and requirements for ACTRIS exploratory platforms	WP5	12	Draft documents distributed
5.3	Draft documentation on ACTRIS National Facility labelling principles	WP5	24	Draft documents distributed
6.1	Definition of user requirements	WP6	12	Report available
6.2	Draft report on access principles, management, and process	WP6	18	Report available
6.3	Access cost analysis performed	WP6	20	Report available
6.4	Definition of key performance indicators	WP6	24	KPIs available
7.1	First indication for level of contractual agreement with third parties transferred to WP2	WP7	6	Input transferred to WP2

7.2	Draft recommendation report for synergetic operations of European Environmental RIs, with focus on atmospheric domain	WP7	12	Report available
7.3	Draft procedures for establishing new CF facility in ACTRIS	WP7	12	Draft document available
7.4	Draft procedures for changing technical requirement in ACTRIS	WP7	12	Draft document available
7.5	Draft recommendations for establishing liaison with international organisations	WP7	18	Draft document available
7.9	Draft recommendation for partnership with private sector	WP7	18	Draft recommendation document distributed
7.6	Draft recommendations for contractual agreement with third-party countries outside Europe	WP7	24	Draft document available
7.7	Draft recommendation for evolution of ICT services in ACTRIS	WP7	24	Draft document available
7.8	Draft recommendations for establishing the contractual agreements for the provision of services to European initiatives and networks	WP7	30	Draft recommendation document distributed
8.1	Preparation of the questionnaire	WP8	9	Questionnaire draft available
8.2	Identification of the user communities and preparation/implementation of the interviews	WP8	20	List of identified user communities available
8.3	Identification of specific case studies as a starting point for quantifying ACTRIS monetary impact	WP8	25	Specific case studies identified and listed
9.1	ACTRIS PPP kick-off meeting	WP9	2	Meeting held
9.2	Associate Partnership forms and application process established	WP9	3	Associate Partnership forms and process available
9.3	Establishment of quality assurance flow	WP9	3	Quality assurance flow approved
9.4	First ACTRIS PPP annual meeting	WP9	12	Meeting held
9.5	Second ACTRIS PPP annual meeting	WP9	24	Meeting held
9.6	ACTRIS PPP final meeting	WP9	36	Meeting held

Risk management of the ACTRIS Preparatory Phase Project

Risk management requires identifying and monitoring risks, and proposing appropriate mitigation actions. The main risks for the successful project progress are identified in the Table 3.2b. Task 1.6 is in charge of providing the ACTRIS risk management plan for both PPP and for the ACTRIS research infrastructure. Together with Task 1.6, the WP9, coordinator and PPP Management Office will perform regular risk monitoring by following the advancement of the project in terms of milestones and deliverables and by observing the early-warning signals of potential deviations and conflicts. The Work Package leaders are also responsible for reporting any imminent risks to Coordination and the Executive Board immediately. The Executive Board will review the key risks and agree on the most appropriate mitigation actions. The CA will also provide for additional tools to minimize and mitigate risks in the consortium. Moreover, EC will monitor the progress via submitted deliverables and its project reviews, e.g., in their mid-term review, the Interim ACTRIS council will monitor the progress of the implementation in its meetings. The detailed Key Performance Indicators (KPIs) for the ACTRIS implementation phase assessing the implementation rate and success will be defined at the PPP beginning. In addition, ACTRIS PPP will develop measures to evaluate the dissemination of ACTRIS products, data and knowledge and to maximize the impact of its communication strategy.

Table 3.2b: Critical risks for implementation

Description of risk	Likely-hood	WPs involved	Proposed risk-mitigation measures
R1: Unavailability of key staff.	Medium	All WPs	A contingency plan will be established, including measures to anticipate shift of responsibilities where necessary.
R2: Lack of coordination among the WPs	Low	All	Qualified WP leaders, frequent interactions and EB meetings and anticipate measures to ensure consistency of approaches and strategies
R3: Lack of commitment from partners	Low	All	The ACTRIS community has a long history of collaborations. Regular interactions among WP leaders and progress monitoring will anticipate suitable corrective actions
R4: Delays and lack of time alignment: due to various interlinkages between work packages, work in one WP could be delayed awaiting the outcomes (deliverables / milestones) from other WPs. This could also delay the ACTRIS business plan (WP1) since its development strongly depends on the results of other WPs. Delays in any of the WPs will lead to delays in the completion of the business plan.	Medium	All	This risk will be minimised via regular Executive Board meetings (additional meeting can be arranged when needed), by an efficient project management to ensure regular and effective communication between WPs, and project monitoring. In addition, joint WP workshops will be arranged to ensure communication across the WPs.
R5: Inability of the key stakeholders to provide in a timely manner the necessary information for developing the policy documents.	Low	WP2	The risk will be minimised by identifying several contact points for each key stakeholder and maintaining regular and effective communication between ACTRIS community and the stakeholders.
R6: Costs are insufficient to carry out an action. Variation in currency exchange rates due to the current global economic situation may create uncertainty in cost estimates.	Low	all	Coordination and management is experienced in cost planning, budgeting, and control. Shift of budgets can be envisaged to optimize the work.
R7: Insufficient sustainable national funding: with the financial responsibility for the progress of ACTRIS being in the hands of each partner and their stakeholders, some partners might fail to ensure a sustainable funding basis in their respective countries.	Medium / high	WP3	The risks will be minimised by i) providing continuous support to the partners regarding budgeting and communications to stakeholders (ACTRIS coordination and management); ii) developing a future funding scenario to account for unforeseen delays or failure of some partners in ensuring sustainable funding; iii) providing uncertainty ranges for the ACTRIS cost estimates
R8: Difficulties in achieving agreements on legal and governance structure.	Medium	WP1-2	Implement efficient communication between key actors and outreach work, workshops and meetings.
R9: Failure to achieve consensus on the concepts / labels / principles among the project partners within the operational framework (concepts and labelling process for the national and central facilities, and infrastructure and data access principles).	Medium	WPs 4-6	The risk can be minimized by i) involving the appropriate number of key persons immediately from the beginning to provide their feedback on the draft working documents; ii) arranging a series of workshops to ensure proper communication of relevant parties; iii) regular evaluation of the progress by the coordinator /management team.
R10: ACTRIS long-term vision and strategy planning needs strong	Low	WP7	To minimise the risk all the relevant stakeholders and user groups will be involved

involvement of various user groups and feedback from stakeholders. The main risk here is that the communication with ACTRIS users and stakeholders cannot be successfully maintained.			right from the beginning of the project and the communication is kept regular and continuous. Workshops / meetings will be arranged to ensure proper level of feedback outside of ACTRIS consortium.
R11: Extensive socio-economic analysis can be costly and time consuming.	Low	WP8	This risk will be minimized by selecting partners with experience in socio-economic analysis to coordinate and carry out the core of the work. Case study-based approach prevents the analysis becoming too broad to be handled within the project and ensures timely execution of the WP tasks.

3.3 Consortium as a whole

ACTRIS PPP consists of 28 beneficiary partners, representing 20 participating countries and the European Commission's Joint Research Centre. Five beneficiaries form Joint Research Units or similar consortia representing additional Linked Third Parties (LTPs) in the project. The project consortium consists of research institutes as beneficiaries that are directly contributing to project work and represent their national ACTRIS consortium in the project. LTPs contribute specific expertise to ACTRIS PPP work specified in section 4.2. Beyond the beneficiaries and LTPs, there are a large number of research organizations committing their resources to ACTRIS activities. These organizations are involved as associate partners in ACTRIS PPP. The regularly updated list of ACTRIS PPP associate partners can be found at the ACTRIS www-site (*http://www.actris.eu/Projects/ACTRISonESFRIroadmap/ACTRISCommunity.aspx*). At the time of ACTRIS PPP submission, the project had 64 associate partners and during ACTRIS PPP project, new associate partners can join via the associate partner programme managed by WP9.

The ACTRIS PPP consortium includes a high level of scientific expertise in research of aerosols, clouds and trace gases. Beneficiaries and LTPs also provide the required expertise for creating and operating the ACTRIS Central Facilities. Furthermore, the ACTRIS PPP consortium has the required expertise to establish the organisational framework for ACTRIS, as the PPP consortium includes expertise in legal and financial matters, project coordination, management and implementation of a RI, socio-economic impact assessment, and outreach. The project consortium has constant communication with relevant user groups and has strong collaborations with industrial partners who can be linked to the project as associate partners. In summary, the PPP consortium has strong expertise and experience for delivering the final project outcome – a research infrastructure.

20 countries show the wide geographical representativeness of ACTRIS. Many of these countries have expressed the interest and capability to operate ACTRIS Central Facilities and all have expressed the interest to host and operate National Facilities. During PPP, constant communication among participating countries and reaching out to potential new countries will be organised and supported by WP1 and WP9.

Maintaining and upgrading the current ACTRIS operations in the participating countries, and developing the technical capacity of the ACTRIS Central Facility components is not *per se* included in the activity of ACTRIS PPP. These actions take place at the national level and are supported by ACTRIS-2. The estimated total investment at the national level for ACTRIS activities during the timeframe of ACTRIS PPP is roughly 110M€, of which 35M€ is used for converting National Facilities to comply with ACTRIS and to transfer ACTRIS from a network to a research infrastructure. Operating the existing National Facilities and national ACTRIS activities requires a 75 M€ investment. Current ACTRIS members and research performing organisations (RPOs) have already committed 80% of the required investment. The 4 M€ of ACTRIS PPP resources will be used for coordinating and streamlining the national investments. The participating countries and RPOs have shown their commitments in the support letters attached into the ESFRI Roadmap proposal; ACTRIS has five ministry-level Letters of Intent (LoI) with political support and committed funding, seven ministry-level LoIs indicating political support, 85 LoIs with funding commitment from Research Performing Organizations (RPO). All RPOS expressed their interest to commit resources to ACTRIS implementation, and are also participating in ACTRIS PPP activities. In addition, ACTRIS has 18 support letters from other RIs and international programs.

Work Packages – National Contributions

Project beneficiaries from all participating countries will be involved in WPs 1, 5 and 7; coordination and support for the national level ACTRIS work and developments (Task 1.3), development of the technical concept and requirements for ACTRIS observational sites (Task 5.1), and identifying the future requirements of atmospheric research infrastructures (Task 7.3).

ACTRIS Finland, represented by FMI and UHEL**,** will coordinate the project and lead the work on developing the ACTRIS governance and legal frameworks (WPs 1-2 lead), ACTRIS strategy and long-term vision (WP 7 lead), and undertake ACTRIS PPP management (WP 9 lead, no other nations are involved). In addition, Finland will contribute to all other WPs. Finland has provided a ministry-level LoI and 4 RPO-level LoIs with funding commitments to ACTRIS.

ACTRIS Italy, represented by CNR, will lead the work on compiling the ACTRIS cost book and developing the ACTRIS funding model (WP3 lead). Italy will also significantly contribute to the development of ACTRIS Central Facility concepts and labelling procedures (WP 4), and determination of ACTRIS access cost model and user fees (WP 6). Italy will also be involved in all other WPs except WP9 (ACTRIS PPP management). The role of Italy will be important in WP8 regarding ACTRIS socio-economic impact analysis. Italy has provided a ministry-level LoI, 4 regional government LoIs and 9 RPOs have provided LoIs with funding commitment to ACTRIS.

ACTRIS France, represented by CNRS, will lead the work on ACTRIS service provision (WP6 lead). France will also make a significant contribution to WPs 1-5 in developing the organizational and operational framework for ACTRIS. In addition, France will be contribute to the ACTRIS strategic framework (WP 7 and 8). France has provided a ministry-level LoI with funding commitment to ACTRIS, naming 17 ACTRIS-related RPOs.

ACTRIS Romania, represented by INOE, will lead the work on developing the concept and selection procedure for ACTRIS Central Facilities (WP 4 lead). In addition, Romania contributes to the work of all other WPs except WP9. The role of Romania is important in WP5 (ACTRIS National Facilities) and WP8 (ACTRIS socio-economic impact analysis). Romania has provided a ministry-level LoI and 7 RPO LoIs with funding commitment to ACTRIS.

ACTRIS Germany, represented by TROPOS and KIT, will lead the work on ACTRIS National Facilities, i.e. development of the technical concept and requirements, and the labelling procedures (WP 5 lead). In addition, Germany contributes significantly to WP 4 and is involved in WPs 1-3 and 6-7. Germany has provided a LoI from the Leibniz Association and 8 RPO LoIs with funding commitment to ACTRIS.

ACTRIS Greece, represented by NOA, will lead the work on analysing ACTRIS socio-economic impacts (WP 8 lead). Greece will also contribute to WPs 1, 5 and 6-7. Greece has provided a ministry-level LoI for political support, naming 16 ACTRIS-related RPOs.

ACTRIS Belgium, represented by BIRA-IASB, will participate in common activities in WPs 1, 5 and 7. BIRA-IASB has provided a Letter of Intent with funding commitment to ACTRIS.

ACTRIS Bulgaria, represented by INRNE, will participate in common activities in WPs 1, 5 and 7. Two Bulgarian RPOs have provided Letters of Intent with funding commitment to ACTRIS.

ACTRIS Czech Republic, represented by CHMI, will contribute to the work of WPs 1, 4-5 and 7. In addition to those activities all partners take part in, the Czech Republic will participate in the development of labels for ACTRIS National Facilities, and testing of the service of ACTRIS Central Facilities. The Czech Republic has provided a ministry-level LoI with funding commitment and list of 4 RPOs related to ACTRIS.

ACTRIS Cyprus, represented by CyI, will participate in common activities in WPs 1, 5, and 7, and additionally in WP 4 and WP 6. Cyprus has provided a ministry-level LoI for political support, naming 4 ACTRIS-related RPOs.

ACTRIS Denmark, represented by AU, will participate in common activities in WPs 1, 5 and 7. AU has provided a LoI with funding commitment to ACTRIS.

ACTRIS Estonia, represented by EULS, will participate in common activities in WPs 1, 5 and 7. Three Estonian RPOs have provided LoIs with funding commitment to ACTRIS.

ACTRIS Ireland, represented by NUIG, will participate in common activities in WPs 1, 5 and 7. The Environment Protection Agency of Ireland has provided a LoI for political support, naming 2 ACTRIS-related RPOs.

ACTRIS Netherlands, represented by KNMI, will contribute to WPs 1, 2, 4, 5, 7 and 8 with the most significant contribution to the work on ACTRIS Central Facilities (WP4) and ACTRIS strategic framework (WP7). The Netherlands have provided a ministry-level LoI with political support and 4 RPO-level LoIs with funding commitments to ACTRIS.

ACTRIS Norway, represented by NILU, will be involved in all WPs (except for WP 9) with the most significant contribution to the work on ACTRIS Central Facilities (WP4), and ACTRIS Service provision (WP6). The Norwegian Environmental Agency has provided a LoI with political support and NILU has provided a LoI with funding commitment to ACTRIS.

ACTRIS Poland, represented by IFG-PAS, will participate in WPs 1-7, with the most important contribution in WPs 5 and 7. Poland has provided a ministry-level LoI with political support and 2 RPO-level LoIs with funding commitments to ACTRIS.

ACTRIS Spain, represented by UPC, UVA and CSIC, will be involved in all WPs (except for WP 9) with the most significant contribution to the development of ACTRIS governance (WP1) and ACTRIS operational framework, especially of ACTRIS Central and National Facility concepts and labelling, and to ACTRIS strategy and long-term vision (WP7). Spain has provided a ministry-level LoI with political support and 7 RPO-level LoIs with funding commitments to ACTRIS.

ACTRIS Sweden, represented by ULund, will participate in common activities in WPs 1, 5 and 7. Two Swedish RPOs have provided LoIs with funding commitment to ACTRIS.

ACTRIS Switzerland, represented by PSI and EMPA, will contribute to WPs 1 and 4-7. In addition to those activities all partners take part in, Switzerland will participate in the development of ACTRIS Central Facility and National Facility (exploratory platforms) concepts (WP5) and testing of ACTRIS CF services (WP4). Switzerland has provided a ministry-level LoI for political support, stating funding from 7 ACTRIS-related RPOs.

ACTRIS United Kingdom, represented by UMAN, NERC and STFC, will be involved in WPs 1-7 with the most significant contribution to the development of the operational framework for ACTRIS i.e. WPs 4-6. UK has provided ministry-level political support and 4 RPO-level LoIs with funding commitments to ACTRIS.

JRC - Joint Research Centre - European Commission will participate in common activities in WPs 1, 5 and 7.

3.4 Resources to be committed

The overall requested ACTRIS PPP budget is 3 999 996 € for 36 months. During this timeframe ACTRIS PPP will mobilise 422 Person Months in addition to all national level resources that are already committed to ACTRIS implementation. The allocation of the PPP budget is shared among the main themes as follows: organizational framework 33.9 %, operational framework 43.2 %, strategic framework 16.2 %, and project management 6.7 %. As the organizational and operational frameworks are the most important activities in the ACTRIS implementation, these themes have the largest share of the budget. The work load and budget have been shared among the participating countries as follows: every participating country is involved in WP1, WP5 and WP7, with related PMs and travel budget. Emphasis is given to the countries interested in hosting the Head Office and leading the ACTRIS implementation, namely to Finland and Italy. In addition, countries that are bringing wide national resources to the ACTRIS and setting up several ACTRIS components (NFs and CFs nodes) have budget share according to this activity. A lump sum of 93 500 € is allocated to the project coordinator (FMI) for facilitating ACTRIS PPP meetings, creating dissemination materials, and supporting travel of associate partners, stakeholders and external experts when needed. A fraction of the beneficiaries' budget is also intended to cover the expenses for participation of associated partners, stakeholders, and other invited external experts in the project meetings.

Table 3.4a: Summary of staff effort

	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	Total PMs per Participant
1 FMI	**14**	6	2	3	0	4	2	0	**15**	**46**
2 UHEL	11	**10**	3	3	2	1	**8**	1	6	**45**
3 CNR	6	3	**20**	**9**	5	**8**	2	4	0	**57**
4 CNRS	6	7	7	10	7	**9**	5	2	0	**53**
5 INOE	3	2	1	**10**	3	3	2	2	0	**26**
6 CHMI	5	0	0	6	8	0	4	0	0	**23**
7 TROPOS	5	2	3	5	**15**	1	1	0	0	**32**
8 KIT	1	2	0	3	3	0	0	0	0	**9**
9 NOA	2	0	0	0	2	1	1	**11**	0	**17**
10 NILU	1	1	1	6	2	**3**	2	1	0	**17**
11 UPC	3	1	1	0	4	0	4	2	0	**15**
12 CSIC	1	0	0	0	1	1	0	0	0	**3**
13 UVA	1	0	1	3	0	1	0	0	0	**6**
14 UMAN	1	1	1	0	0	0	1	0	0	**4**
15 NERC	0	0	0	0	3	1	0	0	0	**4**
16 STFC	0	0	0	3	0	2	0	0	0	**5**
17 KNMI	1	1	0	**4**	2	0	1	1	0	**10**
18 PSI	1	0	0	0	2	0	0	0	0	**3**
19 EMPA	0	0	0	2	0	1	1	0	0	**4**
20 CyI	1	0	0	1	3	1	1	0	0	**7**
21 IGF PAS	1	1	1	1	3	2	3	0	0	**12**
22 ULund	1	0	0	0	1	0	1	0	0	**3**
23 BIRA IASB	1	0	0	0	1	0	1	0	0	**3**
24 NUIG	1	0	0	0	1	0	1	0	0	**3**
25 EULS	1	0	0	0	1	0	1	0	0	**3**
26 AU	1	0	0	0	1	0	1	0	0	**3**
27 INRNE-BAS	2	0	0	0	2	0	2	0	0	**6**
28 JRC	1	0	0	0	1	0	1	0	0	**3**
Total Person/Months	**72**	**37**	**41**	**69**	**73**	**39**	**46**	**24**	**21**	**422**

Table 3.4 b 'Other direct cost' items (travel, equipment, infrastructure, goods and services)
The ACTRIS PPP project requires a significant meeting-related travel. Part of the work will be performed with in-kind contributions from RPOs, but the possibility to travel is supported by the project since it is necessary that all countries can be represented in the meetings to secure the successful outcome of ACTRIS PPP.

1 / FMI	**Cost (€)**	**Justification**
Travel	69 500	FMI participation in relevant project meetings (19 500 €), 40 000 € for supporting the travel of Associated partners, stakeholders and external experts when needed.
Other goods and services	56 000	Costs for annual project meeting arrangements and specific meetings in all WPs when needed and dissemination materials (53 500 € in total), and Financial Audit (2 500€).
Total	125 500	

3 / CNR	**Cost (€)**	**Justification**
Travel	60 000	Participation in project annual meetings and other relevant project meetings, incl. 20000 € for Associated partner travel.
Other goods and services	2 500	Financial Audit
Total	62 500	

4 / CNRS	Cost (€)	Justification
Travel	48 000	Participation in project annual meetings and other relevant project meetings, incl. travel of associated partners and other relevant French stakeholders
Total	48 000	

5 / INOE	Cost (€)	Justification
Travel	30 000	Participation in project annual meetings and other relevant project meetings, especially in WP4, incl. 15 000 € for Associated partner travel.
Total	30 000	

6 / CHMI	Cost (€)	Justification
Travel	13 500	Participation in project annual meetings and other relevant project meetings, incl. 7 600 € for Linked Third Party travel.
Total	13 500	

7 / TROPOS	Cost (€)	Justification
Travel	38 400	Participation in project annual meetings and other relevant project meetings, especially in WP5, incl. 22 400 € for Associated partner travel.
Total	38 400	

8 / KIT	Cost (€)	Justification
Travel	9 600	Participation in project annual meetings and other relevant project meetings.
Total	9 600	

9 / NOA	Cost (€)	Justification
Travel	17 500	Participation in project annual meetings and other relevant project meetings, especially in WP8, incl. 3000 € for Associated partner travel.
Total	17 500	

14 / UMAN	Cost (€)	Justification
Travel	4 800	Participation in project annual meetings and other relevant project meetings.
Total	4 800	

15 / NERC	Cost (€)	Justification
Travel	4 800	Participation in project annual meetings and other relevant project meetings.
Total	4 800	

16 / STFC	Cost (€)	Justification
Travel	5 120	Participation in project annual meetings and other relevant project meetings.
Total	5 120	

17 / KNMI	Cost (€)	Justification
Travel	14 500	Participation in project annual meetings and other relevant project meetings, incl. 6 000 € for Linked Third Party travel.
Total	14 500	

18 / PSI	Cost (€)	Justification
Travel	5 500	Participation in project annual meetings and other relevant project meetings.
Total	5 500	

20 / CyI	Cost (€)	Justification
Travel	12 000	Participation in project annual meetings and other relevant project meetings.
Total	12 000	

21 / IGF PAS	Cost (€)	Justification
Travel	12 800	Participation in project annual meetings and other relevant project meetings, incl. 5 800€ for Linked Third Party travel.
Total	12 800	

22 / ULund	Cost (€)	Justification
Travel	5 000	Participation in project annual meetings and other relevant project meetings.
Total	5 000	

23 / BIRA-ISAB	Cost (€)	Justification
Travel	6 600	Participation in project annual meetings and other relevant project meetings.
Total	6 600	

24 / NUIG	Cost (€)	Justification
Travel	12 800	Participation in project annual meetings and other relevant project meetings.
Total	12 800	

25 / EULS	Cost (€)	Justification
Travel	12 800	Participation in project annual meetings and other relevant project meetings.
Total	12 800	

26 / AU	Cost (€)	Justification
Travel	9 800	Participation in project annual meetings and other relevant project meetings.
Total	9 800	

27 / INRNE-BAS	Cost (€)	Justification
Travel	12 800	Participation in project annual meetings and other relevant project meetings.
Total	12 800	

28 / JRC	Cost (€)	Justification
Travel	5 400	Participation in project annual meetings and other relevant project meetings.
Total	5 400	

Section 4: Members of the consortium

4.1. Participants (applicants)

4.1.1 Ilmatieteen laitos (FMI)

Ilmatieteen Laitos, the Finnish Meteorological Institute (FMI), is a research and service agency reporting to the Finnish Ministry of Transport and Communications. The main objective of the Finnish Meteorological Institute is to provide the Finnish nation with the best possible information about the atmosphere above and around Finland, for ensuring public safety relating to atmospheric, marine and airborne hazards and for satisfying requirements for specialized meteorological products. FMI produces high-quality observational data and research knowledge about the atmosphere and marine, combining its know-how into weather, climate, air-quality and security related services to the benefit of the society and environment. FMI, together with University of Helsinki, is the hosting organization for ICOS ERIC, leads the setting-up of the ESFRI ACTRIS research infrastructure in Europe and is active partner in many research infrastructure and e-infrastructure projects and initiatives. In addition, part of the ICOS Atmospheric Thematic Centre ATC is operated in FMI and ACTRIS CloudDataNet Data Centre component will be located in FMI. FMI runs its own super-computing environment and collaborates closely with national, Nordic, and European super-computing centers and operational services such as ECWMF and international organizations such as WMO.

Role in the project

FMI is coordinating the ACTRIS Preparatory Phase Project. FMI is leading the WP1 (ACTRIS Governance and management) and WP9 (ACTRIS PPP management). FMI has also major contributions to WP2 (Legal Framework) and WP6 (ACTRIS Service Provision). Furthermore, FMI has additional contributions to other WPs: WP3 (Financial Framework), WP4 (ACTRIS Central Facilities) and WP7 (ACTRIS Strategy and long-term vision).

Principal personnel involved

Dr. Sanna Sorvari (female), ACTRIS PPP Project Coordinator, is a Research Manager at FMI. She has over 20 years of experience in climate and environmental change research and she has broad experience in coordination, initiation and implementation of international, European and national research and research infrastructure activities. In recent years she has worked especially on establishing ESFRI Environmental Research Infrastructures at the European and national level, especially Sorvari has worked in setting-up ICOS RI and ICOS ERIC as a member of interim ICOS Head office, Finnish ICOS ERIC General Assembly and ICOS Sweden chair of the Board; supporting ANAEE in its initial phase of the preparatory phase project; developing long-term sustainability strategy for ACTRIS (ACTRIS-I3 and ACTRIS-2); and co-coordinated the ESFRI roadmap process and proposal submission for ACTRIS. Sorvari is a chair of the European Environmental Research Infrastructure Board (BEERi) that organizes the collaborative strategic cluster work of Environmental RIs at the European level. She is WP leader or key contributor in many EC-funded research infrastructure project, e.g. WP leader for ENVRI, Theme leader for ENVRIplus; WP leader for COOPEUS and COOP+ -projects. Internationally Sorvari is also active in data infrastructure collaboration, e.g. she is a co-chair of the OECD Expert Group on International Data Infrastructures, Scientific Steering Committee member of ICSU World Data Systems and she was a member of Belmont Forum's Env. data management action. Currently she is coordinating ESFRI ACTRIS in its implementation work.

Dr. Niku Kivekäs (male**)**, ACTRIS PPP Project Manager, has 11 years of expertise in aerosol- and cloud research. He obtained his PhD in Physics in 2010 at University of Helsinki, Finland, and he has been working at FMI and at Lund University, Sweden. His research has been focused on analysing long data sets of aerosol measurements from around globe. He is currently the project manager for the coordination of ACTRIS at the European level, including the process of obtaining approval to place ACTRIS on the ESFRI Roadmap 2016. He has published 24 peer-reviewed scientific papers.

Dr. Ewan O'Connor (male) is a Tenure-track Professor and develops and uses new radar and lidar techniques to retrieve cloud, aerosol and turbulent parameters to understand cloud processes, and for the evaluation and improvement of numerical forecast and climate models. He is responsible for the design and implementation of the Finnish Doppler lidar network, and new ACTRIS/Cloudnet site at Sodankyla, and coordinates Cloudnet. He has been involved in several international research projects as WP leader, and is chair of the working group on Doppler lidar within the EU COST Action TOPROF. He has published 46 papers, and is currently co-supervising five postgraduate students.

[ACTRIS PPP]

M.A. Anna Salonen (female) is a Research Administration Coordinator and provides support in administrative and financial issues to co-funded projects at FMI. She has been working in several coordination projects as well as CSA projects in FP7 and H2020.

Adjunct Prof. Heikki Lihavainen (male) is head of the Atmospheric Composition Research unit. His fields of expertise are field and laboratory measurements related to aerosol properties. He has some 113 published research papers, two in Science. He has been (and is) supervising several Ph.D students, 4 (7). He has been part of several national and international research projects also as PI or WP leader. He is a member of the expert group on short lived climate forcers in The Arctic Monitoring and Assessment Programme. He is a member of FCoE (Finnish Centre of Excellence) "From Molecular and Biological Processes to the Global Climate". He is also the responsible person for Finnish GAW station in Pallas (Pallas Atmosphere-Ecosystem Supersite).

Dr. Eija Asmi (female) is the head of the Atmospheric Aerosols group at FMI currently consisting of 20 postdoctoral and PhD students, working on aerosol physical and chemical characterization. She has been responsible for maintaining and developing aerosol measurements as part of networks in Finland and in several stations abroad, including aerosol in-situ, profiling and airplane studies. Her major expertise is experimental studies of polar aerosols and aerosol-cloud interactions. She has >40 published peer-reviewed articles (h-index 18), and she is active in several national and international networks and programs, inc. Finnish Center of Excellence (FCoE), International Arctic Systems for Observing the Atmosphere (IASOA) and Association for polar early career scientists (APECS).

Relevant publications

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5. A.J. Morcrette, E. J. O'Connor, and J. C. Petch, "Evaluation of two cloud parametrization schemes using ARM and Cloudnet observations," Q. J. R. Meteorol. Soc., vol. 138, pp. 964–979, 2012.

Relevant projects

1. ACTRIS-2 - Aerosols, Clouds, Trace gases, Research Infrastructure - 2, 2015-2019, Grant agreement no 654109.
2. ENVRI – Common Operations for Environmental Research Infrastructures, 2011 – 2015, Grant agreement no 283465; continuing as ENVRIplus, 2015 – 2019, Grant agreement no 654182.
3. COOPEUS – Building a Framework for a Sustainable, Transatlantic Cooperation in the Field of Environmental Research Infrastructure, 2012 -2014, Grant agreement no 312118, continuing as COOP+, 2015 – 2019, Grant agreement no 654131.
4. BACCHUS "Impact of Biogenic versus Anthropogenic emissions on Cloud and Climate" 2013-2017, Grant agreement no 603445.
5. EUCAARI-European integrated project on aerosol cloud climate and air quality interactions, 2007-2012, Grant agreement no 036833.

Significant infrastructures

[ACTRIS PPP]

FMI hosts Pallas Atmosphere-Ecosystem Supersite in Finnish Lapland above the Arctic Circle, which is part of WMOs Global Atmosphere Watch (GAW) programme. The station is also a member of other networks (e.g. AMAP, EMEP, ICOS, ACTRIS, IASOA). Atmospheric composition and aerosol parameters have been measured at Pallas since 1994.

As part of its research remit, FMI performs world-leading experimental research on aerosols, clouds and aerosol precursors as well as greenhouse gases in Finland and in key places around the globe (e.g. in Arctic and Antarctic, Himalayas in India, in northern Siberia in Russia). FMI is a member of EARLINET and operates national ceilometer and Doppler Lidar networks and a research Cloud Radar. FMI remote sensing observations are complemented with airplane and UAV –observation systems.

FMI will be the main contributor to ACTRIS Head Office in Helsinki. Furthermore, FMI will contribute to the ACTRIS Data Centre by hosting the CloudDataNet component of the Data Centre, focusing on observations of cloud parameters. FMI is planning to include the following observational stations to ACTRIS: Pallas, Sodankylä, Utö, Puijo, Marambio (Antarctica), and possibly station(s) from Russian Arctic and Indian Himalayas.

4.1.2 Helsingin yliopisto (UHEL)

Helsingin yliopisto (University of Helsinki) is a European research university with over 34,000 students and 8,000 employees. UHEL is the largest and most versatile university in Finland and ranks among the top 100 universities worldwide. It is a research university with many Academy of Finland designated National Centres of Excellence (10 for 2012-2017, 11 for 2014-2019). The Division of Atmospheric Sciences, Department of Physics at UHEL has over 30 year tradition in atmospheric research and research coordination, including coordination of several Framework Programme projects. In addition to ACTRIS, the Division is strongly connected to many other major European and international research and research infrastructure initiatives such as ICOS, ANAEE, RDA, EUDAT and LTER.

Role in the project

UHEL will have a significant role in the project regarding the development of ACTRIS legal and governance framework, human resources planning, coordination of national level ACTRIS activities, strategic development of ACTRIS including links with other European RIs and initiatives, and future needs for atmospheric RIs. UHEL will lead the work packages "Legal Framework" (WP2) and "ACTRIS Strategy and Long-term Vision" (WP7). In addition, UHEL will actively contribute to the work of other WPs, especially to WP1 with a leading role for the tasks 1.3 and 1.4. UHEL will also significantly contribute to ACTRIS PPP management (WP9).

Principal personnel involved

Prof. Markku Kulmala (male): Director of the Division of Atmospheric Sciences at the Department of Physics, and professor at the University of Helsinki since 1996. Kulmala also acts as coordinator for the Centre of Excellence, appointed by the Academy of Finland first time in 2002 and for Nordic Center of Excellence, appointed by Nordforsk ("Cryosphere-atmosphere interactions in a changing Arctic climate" (CRAICC)), which is the largest joint Nordic research and innovation initiative to date, aiming to strengthen research and innovation regarding climate change issues in the Nordic and high-latitude Regions. Prof. Kulmala together with Prof. Pertti Hari is the primary inventor of the SMEAR (Stations Measuring Ecosystem Atmospheric Relations) concept. According to the ISI Web of Knowledge, M. Kulmala is in the first place in the Citation Rankings in Geosciences (since 1.5.2011). His H-factor is 89. Prof. Kulmala has received several international awards such as the Smoluchovski Award (1997), the International Aerosol Fellow Award (2004), the Wilhelm Bjerkenes medals (2007), Fuchs Memorial Award (2010) and Litke Medal (2015). In 2015 he was acknowledged by a membership of the CASAD, Chinese Academy of Sciences, (CAS). Kulmala together with the Prof. Sergej Zilitinkevich is the initiator of the large scale multi - disciplinary Pan-Eurasian Experiment (PEEX) Program.

Dr. Pirjo Kontkanen (female): Doctor of Laws, is a Legal Counsel at the University of Helsinki and works at the university central administration. She is expert on intellectual property rights, especially copyrights, and has over ten years of experience about legal matters and negotiations concerning university research projects and EU research funding. She has been involved in several ESFRI projects, like EATRIS, CLARIN, EPOS, AnaEE and especially ICOS helping to draft and negotiate all the relevant documents and agreements for the ICOS ERIC and ICOS RI. She is also participating in EPOS IP project at the moment working on the legal documents for the planned EPOS ERIC.

Dr. Silja Häme (female): Post-doctoral researcher at the University of Helsinki with 9 years of experience in aerosol and climate change research. With a renowned Fulbright scholarship, she performed essential part of her doctorate research at Columbia University in the city of New York during 2012-2014. She obtained her PhD at the Department of Physics, University of Helsinki in 2015. In addition to her background as an aerosol physicist, she is experienced in administrative and research politics related reporting and planning, and development tasks. She has previously been involved in the environmental Research Infrastructure AnaEE (Analysis and Experimentation on Ecosystems); Project manager for AnaEE-Finland and a member of EU-FP7-AnaEE Preparatory Phase Project working group developing long-term legal, governance and funding framework for the research infrastructure.

Prof. Tuukka Petäjä (male): Professor, 2013-; Head of Aerosol laboratory, 2013-; Head of Värriö sub-arctic research station and SMEAR I-II stations, 2013-; Pan Eurasian Experiment science director 2014-; Post-doctoral researcher at National Center for Atmospheric Research (NCAR) 2007-2008. Thompson Reuters Highly Cited Scientist, 2014-15; Academician, International Academy of Eurasian Studies, 2014; Science and Technology in Society Future Leader, New York Academy of Sciences, 2015; Väisälä award, for innovations in aerosol science and technology, 2013; PI for Biogenic Aerosols – Effects on Clouds and Climate (BAECC) for US Department of Energy. Currently 245 peer reviewed journal articles out of which 8 in Science, 6 in Nature and 1 in Physical Review Letters, 1 in Nature Protocols, 2 in Nature Geosci. Total citations: 7920, h-index: 45 (ISI Web of Knowledge, 9.6.2016); ISI ranking in Geosciences: 78; Research topics: Mass spectrometry and measurement

techniques for aerosols and trace gases; Comprehensive long-term observations and field campaigns; Aerosol-cloud-climate-biosphere interactions.

Dr. Paolo Laj (male) holds a PhD in Physical Sciences, in Atmospheric Physics and Chemistry. His research thematic deals with the composition of the free troposphere and with the metrology of aerosol particles. He published more than 120 publications since 1990 in the field of atmospheric aerosols processes and variability, clouds physics and chemistry, precipitation chemistry, glaciochemistry with h factor of 36. He is the winner of the 2002 CNRS Bronze medal award, and obtained the Hägen-Smit Prize in 2014. He is currently Professor at UHEL, division of Atmospheric Science, working part-time. As a scientific manager, at European level, he is actually the scientific co-coordinator of the Cluster Project ENVRIplus, and of ACTRIS-2, and has been co-coordinator of ACTRIS I3 (FP7). Paolo Laj also has different responsibilities in international instances: member of the Scientific Committee of the initiative called "Sixth Global Environment Outlook", chairman of the SAG commission Global Atmosphere Watch OMM from 2015. He is also a scientific expert for Italy (National evaluation commission of scientific research) and Switzerland (for international cooperation). Paolo Laj works 25 % at UHEL and 75 % at CNRS, France.

Dr. Hanna K. Lappalainen (female): Pan-Eurasian Experiment (PEEX) Secretary General, works currently at PEEX Headquarters, at the University of Helsinki (Division of Atmospheric Sciences, Department of Physics). She has long-term experience in coordinating large-scale research projects and funding applications and has been working as a research coordinator and a science coordinator in the projects such as "European Integrated Project on Aerosol Could Climate and Air Quality Interaction" EU-FP7-EUCAARI (2007-2010) and "Finnish Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change" (2012-2013). Lappalainen has received NASA Goddar Team Award EOS-AURA satellite OMI-Team in 2005 and an International Eurasian Academy of Sciences (IEAS) Silver medal in 2015. Since 2014 Lappalainen has been a representative of Finland in the Sustainable Arctic Observing Network (SAON) Data working group and a Future Earth - iLEAPS Steering Group Member. She obtained her PhD from the Department of Biological and Environmental Sciences, University of Helsinki, Finland and has been engaged in analysis of the atmospheric concentration of the Biogenic Volatile Organic Compounds (BVOCs) and plant phenological time series and modelling.

Dr. Tuija Jokinen (female): obtained her M.Sc. in chemistry and did her Ph.D. in physics (2015) receiving a dissertation award for her multidisciplinary thesis conducted with a high level of international collaboration. Before graduating she worked as a visiting scientist, teaching mass spectrometric methods for gas phase aerosol precursor studies, at the TROPOS institute in Germany. She is currently a postdoctoral fellow at the University of California, Irvine (UCI) chemistry department working with novel mass spectrometric methods and developing new analysis methods for ambient low volatility molecules. She has years of experience in experimental gas phase aerosol precursor molecules and cluster studies and related method development. She has done experimental work and several field campaigns with large collaborations such as the CLOUD experiment at CERN, CRAICC campaign at Station Nord in Greenland and FINNARP2014-expedition to Antarctica. She has first author publications in high impact journals PNAS and Angwandte Chemie and on top of that 4 articles in Nature, 1 in Science and1 in Nature Communication.

Relevant publications

1. Kulmala, M., Asmi, A., Lappalainen, H. K., et al.: General overview: European Integrated project on Aerosol Cloud Climate and Air Quality interactions (EUCAARI) – integrating aerosol research from nano to global scales, Atmos. Chem. Phys., 11, 13061-13143, 2011.
2. Kulmala, M., Lappalainen, H. K., Petäjä, T., Kurten, T., Kerminen, V.-M., Viisanen, Y., Hari, P., Sorvari, S., Bäck, J., Bondur, V., Kasimov, N., Kotlyakov, V., Matvienko, G., Baklanov, A., Guo, H. D., Ding, A., Hansson, H.-C., and Zilitinkevich, S.: Introduction: The Pan-Eurasian Experiment (PEEX) – multidisciplinary, multiscale and multicomponent research and capacity-building initiative, Atmos. Chem. Phys., 15, 13085-13096, 2015.
3. Hari, P., Petäjä, T., Bäck, J., Kerminen, V.-M., Lappalainen, H. K., Vihma, T., Laurila, T., Viisanen, Y., Vesala, T., and Kulmala, M.: Conceptual design of a measurement network of the global change, Atmos. Chem. Phys., 16, 1017-1028, 2016.
4. Petäjä, T., O'Connor, E. J., Moisseev, D., Sinclair, V. A., Manninen, A. J., Väänänen, R., von Lerber, A., Thornton, J. A., Nicoll, K., Petersen, W., and Chandrasekar, V.: BAECC A field campaign to elucidate the impact of Biogenic Aerosols on Clouds and Climate, Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-14-00199.1, in press, 2016.

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Relevant projects

1. EU H2020 project ACTRIS 2 (Aerosol, Clouds, and Trace gases Research Infrastructure), Grant agreement n. 654109 (2015-2019).
2. EU H2020 project ENVRIPLUS (Environmental Research Infrastructures Providing Shared Solutions for Science and Society). Grant agreement n. 654182 (2015-2019).
3. EU FP7 project ACTRIS (Aerosol, Clouds, and Trace gases Research Infrastructure network). Grant agreement n. 262254 (2011-2015).
4. Academy of Finland project Centre of Excellence in Atmospheric Science – From Molecular and Biological processes to The Global Climate. Grant agreement n. 272041 (2014-2019).
5. Academy of Finland project INAR RI II (The Integrated Atmospheric and Earth System Science Research Infrastructure). Grant agreement n. 283455 (2015-2016).

Significant infrastructures

UHEL operates three extensive multidisciplinary SMEAR (Stations for Measuring Earth surface and Atmosphere Relations) observation sites in Finland. They cover regions from subarctic regions of Lapland to Baltic Sea region in Southern Finland. These observation sites are part of ACTRIS-Finland, and connected to ICOS, ANAEE, LTER, GAW and other international infrastructures and initiatives. In addition to the SMEAR I-III stations, ACTRIS-Finland facilities hosted by UHEL include a state-of-the-art aerosol, cluster and trace gas laboratory.

UHEL will contribute to host the ACTRIS Head Office in Helsinki. In addition to this, UHEL will significantly contribute to ACTRIS Trace Gas Calibration Centre. Finnish part of the Centre will perform instrument and methodology development for reactive trace gases, atmospheric oxidants and cluster measurements, as well as promote education and outreach activities for the scientific community and for general public.

4.1.3 Consiglio Nazionale Delle Ricerche (CNR)

Consiglio Nazionale Delle Ricerche, The National Research Council of Italy, is the largest public research performing organization in Italy, reporting directly to the Ministry of the Education, University and Research. Its duty is to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development. It is organized in seven Departments coordinating the activities of more than 100 Institutes in the main fields of knowledge, from life sciences to engineering, from earth system science to humanities, and managing the research infrastructures.

The CNR Department of Earth System Science and Environmental Technologies (CNR-DTA, www.dta.cnr.it) is one of them. Its mission is to support and coordinate the research activities carried out by its 13 associated Institutes dealing with environmental sciences, including climate change, and the development of innovative monitoring technologies. The activities of the Department of Earth System Science and Environmental Technologies (DTA) are carried out by a staff of approximately 1100 people supported by approximately other 800 collaborators in the research area.

In the consortium two institutes of CNR - DTA are involved: IMAA and ISAC.

The Institute of Methodologies for Environmental Analysis (IMAA) research activities involve more than 100 researchers and make use of laboratories and facilities of international relevance in the field of the Earth Observation. The IMAA scientific mission is the study of the atmosphere and of the Earth's surface by using remote sensing techniques, environmental and geophysical monitoring, the evaluation of the impacts of the anthropogenic activities system and the implementation of optimising models to assess the best allocation of resources.

The Institute of Atmospheric Sciences and Climate (ISAC) employs over 200 staff members to conducts pure and applied research on atmospheric sciences and the climate system and to produce results directly transferable to the society also beyond the national borders. The headquarters is located in Bologna, and other six sections and units are located around the country: Roma, Lecce, Lamezia Terme, Cagliari, Padova and Torino. ISAC is organized into eight research divisions: Climate dynamics and variability - DIVAC; Studies and modeling of dynamic and turbulent processes in the atmosphere - MODAT; Clouds and Precipitation Physics - CAPE; Sources, transformation and deposition of anthroPgenic and natural compounds and air quality-climate interactions - STOPPER; Physical Observations and Modelling for a Healthy Atmosphere - POEMHA; Global Ocean Satellite monitoring and marine ecosystem studies – GOS; Natural, environmental and anthropic hazards of cultural heritage – RICH; Climate hotspots: atmospheric observations and technological development – HOTSPOT and a technical service structure that are integrated by seven atmospheric and climate observatories.

Role in the project

CNR will coordinate the Work package "Financial Framework" (WP3) and it will actively contribute to other WPs. CNR will strongly contribute to WP4 with a leading role for the task 4.2 and to WP6 with a leading role in task 6.3. CNR will also contribute to WP1, WP2, WP5, WP7 and WP8.

Principal personnel involved

Dr. Gelsomina Pappalardo (**female)** is the chief scientist of the Head of Lidar Group and of the CNR-IMAA Atmospheric Observatory (CIAO). She has over 25 years of research experience in the field of atmospheric studies with lidar techniques. She has authored or co-authored more than 70 papers in the peer-reviewed literature. Dr. Gelsomina Pappalardo participated as PI in several national and international projects. She is the coordinator of the H2020 ACTRIS-2 Project. Dr. Gelsomina Pappalardo is co-chair of GALION and member of the Scientific Advisory Group for Aerosols of the Global Atmosphere Watch (GAW) aerosol program of WMO. Dr. Pappalardo is the Chair of the ESFRI Strategy Working Group for Environmental Science.

Dr. Carmela Cornacchia (female) is researcher at CNR-IMAA. She has experience in Earth Observation methodologies and technologies for atmospheric study. She is involved in technology transfer activities at IMAA, working at the implementation of the triple helix model for spreading innovation in regional context and enhancing collaboration between researchers, industrial partners and public authorities. She is promoting the activities of the regional technological cluster TeNR - Earth Observation and Natural Hazard Technologies, as well as fostering the participation of CNR to the regional clusters on the 5 priority areas of the regional Smart Specialization Strategy. Since 2008, she has been the head of R&D office at CNR-IMAA and she is charge of coordinating and managing several RTD projects at regional, national and EU level in Earth Observation, Environmental and Smart Cities related issues. She is presently collaborating with the local administration to support the regional Smart Specialization Strategy development.

Dr. Lucia Mona (female): is a researcher at CNR-IMAA. Dr Mona has a researcher profile that combines expertise on developments of lidar systems, instruments integration/combination, analysis methodologies, exploitation of state-of-the-art measurements for different application fields and integrated studies with models. She is working on exploitation of EARLINET (European Aerosol Research Lidar NETwork) database for comparison/integration with other ground-based and satellite measurements and models and model evaluation/integration studies for peculiar long-range transport cases and for multi-year observation. She is leading the AEROSAT (International Satellite Aerosol Science Network) Working Group on Aerosol Typing. She is member of the Regional Steering Group of the SDS-WAS (Sand and Dust Storm Warning Advisory and Assessment System) of the WMO.

Dr. Paolo Bonasoni (male): senior researcher at the CNR-ISAC responsible of Climate Hot-Spot research department, and former head of the research infrastructures: Climate Observatory "O. Vittori" at Mount Cimone and Nepal Climate Observatory-Pyramid (two GAW-WMO global stations). Main scientific interests: physical and chemical processes of ozone and other atmospheric compounds in remote mountain regions and in background conditions; climate change in mountain regions; environmental technologies for climate observations in mountain and remote areas. Principal investigator in several international projects (VOTALP I & II, MINATROC, STACCATO, EUSAAR, ACCENT, ACTRIS, POLPO, SHARE, ...). Dr. Paolo Bonasoni was the coordinator of the project ESF-PON "High Technology Infrastructure for Integrated Climate and Environmental Monitoring" (I-AMICA) devoted to the development of research infrastructures, located in Southern Italy, for climate and environment observations. He is author or co-author of more than 80 papers in the peer-reviewed literature.

Dr. Angela Marinoni (female) has degree and PhD in Environmental Science, with experience on chemistry and photochemistry of aerosol, cloud and precipitations in different environments. She is working since 2005 at CNR-ISAC, where she gained experience on integration of observations concerning chemical, physical and optical aerosol properties, especially in mountain and remote areas. She is responsible for the measures of atmospheric aerosol at the GAW global stations of Monte Cimone (Northern Apennines, 2165 m), Nepal Climate Observatory-Pyramid (Himalayas, 5079 m asl), WMO/GAW regional station of Capo Granitola and in the framework of EUSAAR and ACTRIS (1 and 2)projects. She is author or co-author of about 50 papers in ISI journals.

Dr. Paolo Cristofanelli (male), PhD in Environmental Science, is researcher at CNR-ISAC. He is head of the Climate Observatory "O. Vittori" GAW-WMO Global Station at Mount Cimone and PI for investigation programs on reactive gases at the WMO/GAW regional station of Capo Granitola. In the framework of ICOS (Integrated Carbon Observation System) European Research Infrastructure, he is PI for Monte Cimone observations. His expertise is related to in-situ trace gas observations, related measurement techniques and data diagnostics for atmospheric process interpretation.

Relevant publications

1. Pappalardo, G., Amodeo, A., Apituley, A., Comeron, A., Freudenthaler, V., Linné, H., Ansmann, A., Bösenberg, J., D'Amico, G., Mattis, I., Mona, L., Wandinger, U., Amiridis, V., Alados-Arboledas, L., Nicolae, D., and Wiegner, M.: EARLINET: towards an advanced sustainable European aerosol lidar network, Atmos. Meas. Tech., 7, 2389-2409, doi:10.5194/amt-7-2389-2014, 2014.
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3. Papagiannopoulos, N., Mona, L., Alados-Arboledas, L., Amiridis, V., Baars, H., Binietoglou, I., Bortoli, D., D'Amico, G., Giunta, A., Guerrero-Rascado, J. L., Schwarz, A., Pereira, S., Spinelli, N., Wandinger, U., Wang, X., and Pappalardo, G.: CALIPSO climatological products: evaluation and suggestions from EARLINET, Atmos. Chem. Phys., 16, 2341-2357, doi:10.5194/acp-16-2341-2016, 2016.
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Relevant projects

1. EU H2020 project ACTRIS 2 (Aerosol, Clouds, and Trace gases Research Infrastructure), Grant agreement n. 654109 (2015-2019).
2. EU H2020 project ENVRIPLUS (Environmental Research Infrastructures Providing Shared Solutions for Science and Society), Grant agreement n. 654182 (2015-2019).
3. EU H2020 project ECARS (East European Centre for Atmospheric Remote Sensing). Grant Agreement n. 692014 (2016 - 2018).
4. EU H2020 project GAIA-CLIM (Gap Analysis for Integrated Atmospheric ECV CLImate Monitoring). Grant Agreement n. 640276 (2015 - 2018).
5. EU FP7 project ACTRIS (Aerosol, Clouds, and Trace gases Research Infrastructure network). Contract n. 262254.

Significant infrastructures

CNR hosts two atmospheric observatories: CIAO (CNR-IMAA Atmospheric Observatory, www.ciao.imaa.cnr.it) located in Tito, Southern Italy, on the Apennine mountains (40.60N, 15.72E, 760 m a.s.l.) less than 150 km from the West, South and East coasts, and Monte Cimone "O. Vittori" GAW-WMO Global Station (CNR-ISAC, www.isac.cnr.it/cimone) located in the highest peak of the Northern Italian Apennines (40.76N, 10.70E, 2165 m a.s.l.).

CNR contributes to the ACTRIS Data Center hosting the EARLINET data base for the lidar profiling data and providing the access to the use of the aerosol profiling Single Calculus Chain (SCC) developed within EARLINET. Moreover, CNR contributes to the LICal (Lidar Calibration Center) Central facility providing the access to one of the EARLINET reference system in both mobile and fixed configuration.

4.1.4 Centre National de Recherche Scientifique (CNRS)

The **French National Centre for Scientific Research (CNRS)** is a government-funded research organization, under the administrative authority of France's Ministry of Research. With about 33.000 staff (researchers, engineers, technicians and administrative staff) and a 2014 budget of 3.29 billion euros, CNRS is the largest fundamental research organization in Europe. It is organized through ten institutes and is involved in all scientific fields including life sciences, physics, chemistry, mathematics, computer science, earth science and astronomy, humanities and social sciences, environmental sciences and sustainable development, and engineering. CNRS conducts some twenty interdisciplinary programs to promote exchange between fields, ensure economic and technological development, and to solve complex societal problems. More than 95% of the 1100 CNRS laboratories, which are spread throughout the French territory, represent joint research units with universities and industry.

CNRS is represented in the project by nine institutes: Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE), Laboratoire de Météorologie Physique (LAMP), Institut National des Sciences de l'Univers (INSU), Pierre Simon Laplace (IPSL), Institut Laboratoire d'Optique Atmosphérique (LOA), Laboratoire des Sciences du Climat et de L'Environnement (LSCE), Unité Mixte de Service de l'OSU Réunion (OSUR), Observatoire de Versailles Saint-Quentin en Yvelines (OVSQ), Laboratoire d'Aérologie (LA). Furthermore involved in the project are two joint research units: Université Grenoble Alpes (UGA), and Université de Lille, Sciences et Technologies (Lille 1).

The **Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE)**, Grenoble, is a Joint Research Unit (JRU) between Université Grenoble Alpes and the Centre National de la Recherche Scientifique (CNRS). It is one of the leading laboratories in "cold region science", covering a broad range of research topics related to glaciology (both theoretical and experimental), ice cores (with leading participation in large successful projects such as Vostok, GRIP, EPICA and NEEM), climate research (modelling and field work) and atmospheric chemistry research in polar and mountain regions. LGGE has a staff of approximately 70 permanent researchers for a total staff of approximately 140 people. LGGE has been participating in observation studies with both the observations from high altitude observatories related to GAW and the expertise in source apportionment studies.

The **Laboratoire de Météorologie Physique (LAMP),** Clermont-Ferrand, has a long-standing experience in the experimental and modelling studies of clouds and their interactions with solar radiation and atmospheric gaseous and particulate compounds. The main research activities deal with the formation of new particles, the role of aerosols in the formation of iced and mixed-phase clouds and their impact on the Earth's radiation budget. It implements the gaz, aerosol and cloud observation site of Puy-de-Dôme, labelled global GAW station, where some of the aerosol chemical, physical and optical properties are monitored since 1996. LaMP has co-ordinated, participated, and managed a number of EU projects from FP4 to H2020 and participates in several national and international programmes.

The **Institut National des Sciences de l'Univers (INSU)**, is the National Institute for Earth Sciences and Astronomy and elaborates, develops and coordinates research and projects in astronomy, Earth and planetary science, ocean and atmosphere sciences and space sciences. INSU undertakes and coordinates research performed at national and international levels by CNRS and other public French research bodies. It develops, pilots and implements instruments for very large facilities: platforms (geophysical and geodetic networks and borehole measurements), observatories (astronomy, seismology, oceanography, meteorology, geophysical hazards, land use), observation services, and computing facilities (databanks, community models, centres for satellite data analysis). INSU has a strong involvement in many European EC funded projects in various fields.

The **Institut Pierre-Simon Laplace (IPSL)** is a CNRS research institute in environmental and climate sciences that federates nine national research laboratories of which two are participants in the project (Laboratoire des Sciences du CLimat et de l'Environnement (LSCE) and Laboratoire Atmosphère, Milieux, Observations Spatiales (LATMOS)). These laboratories are developing a common strategy for the study of the Earth System as a whole and for the study of other objects in the solar system. The IPSL federation has a 20 year record of producing climate observations through direct operation of atmospheric monitoring infrastructures (for stratospheric ozone, green-house gases and aerosols) and the SIRTA multi-parameter atmospheric research observatory located near Paris (clouds, aerosols, radiation, dynamics, …), contributing to international networks (e.g. NDACC, ICOS, BSRN, GRUAN, ACTRIS, …). IPSL has also a long record in handling and processing large modelling, satellite and ground-based datasets (through its computing and data processing center), distributing data to users worldwide. IPSL researchers developed innovative methods to reprocess multi-parameter ground-based atmospheric profiling measurements to produce harmonized, quality controlled datasets covering decadal to multi-decadal time scales.

The **Laboratoire d'Optique Atmosphérique (LOA**) is a Joint Research Unit of CNRS and University of Lille 1, and has a well-known expertise in remote sensing and study of tropospheric and stratospheric aerosols, clouds and their links with shortwave, longwave radiations and climate. LOA is one of the key laboratories in the world operating the AERONET network (Service National d'Observation PHOTONS) and developing retrieval algorithms, such as GRASP, for ground-based networks (sun-photometer and LIDAR) and space-borne missions (POLDER, MODIS, PARASOL and the future 3MI in 2020). LOA is also one of the key laboratories that created the ICARE satellite database and processing centre as part of the French Data centre for Atmospheric Research, AERIS. Since 2012, LOA is also coordinating the CaPPA (Chemical and Physical Processes in the Atmosphere) project involving 7 laboratories from University of Lille and University of Littoral and Ecole des Mines de Douai. LOA is managing, for long term observation, 2 super sites dedicated to atmospheric characterization located in Lille and Dakar and is contributed to AERONET, NDACC and EARLINET network. LOA, recently, participated in several FP7 and H2020 such as ACTRIS I3 projects.

The **Laboratoire des Sciences du Climat et de l'Environnement (LSCE)** is a Joint Research Unit of CNRS, the Commissariat à l'Energie Atomique (CEA) and the Université Versailles-Saint Quentin (UVSQ) and part of the Institut Pierre-Simon Laplace (IPSL). LSCE, located at Gif/Yvette in the region of Paris, France covers numerous fields of research related to climate and environment and, in particular, atmospheric composition monitoring, Earth System modelling and modelling of biogeochemical cycles, geochronology and analysis of environmental geomarkers, climate variability and dynamics. LSCE regroups approximately 300 staff with about 150 permanent researchers. LSCE is currently involved in a large number of international (GAW related) atmospheric networks and is playing a major role in the ICOS European infrastructure.

The **Observatoire des Sciences de l'Univers - la Réunion (OSU-R)** is a research center under administration by CNRS and Université de la Réunion, located in La Réunion Island. OSU-R carries out extensive trans-disciplinary and cutting-edge research in atmospheric, geophysical, geological, and ecological (marine and forestry) domains of sciences and engineering. With regards to observations, OSU-R manages geophysical stations including the Maïdo facility (atmospheric observatory at 2160 m asl), marine, forest and hydrological stations, for delivering quality long-term services and for promoting trans-disciplinary researches conducted by laboratories federated under OSU-R. Among these laboratories, LACy (Laboratoire de l'Atmosphère et des Cyclones, CNRS, Université de La Réunion and Météo-France) works as a scientific operator of the Maïdo observatory and is structured in 3 groups dedicated to research on tropospheric and stratospheric processes and on tropical cyclones. The Maïdo Observatory hosts an extensive range of instruments labelled in international networks (NDACC, AERONET, SHADOZ, ICOS, GAW/WMO).

The **Observatoire de Versailles Saint-Quentin en Yvelines (OVSQ)** is a mixed research observatory between CNRS and Université de Versailles Saint-Quentin en Yvelines. The main component of UVSQ in the fields of climate change, sustainable development and planetary research with 40 faculty staff members, it manages long-term observation of atmospheric composition within NDACC and ICOS international networks and maintain experimental platforms for the integration and test of instruments dedicated to planetary and atmospheric research.

The **Laboratoire d'Aérologie (LA)** , a Joint Research Unit of Centre National de la Recherche Scientifique (CNRS) and University of Toulouse, specialises in the atmospheric sciences. The scientific objectives deal with the observation and the numerical modelling of dynamic and chemical processes controlling the evolution of the atmosphere. The development of numerical models for atmospheric studies, the innovation and maintenance of observing networks (e.g. IGAC/DEBITS/INDAAF in Africa, INSU/P2OA platform at the Pic du Midi, France) and observations of tropospheric gases aboard commercial aircrafts (IAGOS) are among the recognised strengths of the research unit.

CNRS will be representing the interest of the French Research Performing Organisations (RPO) participating in the national ACTRIS-FR project. These RPOs will be associated partners to the project and are the following: Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA), Centre National d'Etudes Spatiales (CNES), Météo-France (MF), Institut National de l'EnviRonnement Industriel et des RisqueS (INERIS), Université Institut Paul-Emile-Victor (IPEV), Institut Pierre Simon Laplace (IPSL), Institut de Recherche pour le Développement (IRD), Ecole des Mines de Douai (EMD), Institut Paul-Emmile-Victor (IPEV), Université Clermont Auvergne (UCA), Université de la Réunion (UR), Université Fédérale de Toulouse-Midi-Pyrénées (UFTMIP), Université de Versailles Saint-Quentin en Yvelines (UVSQ), Université Paris-Est Créteil (UPEC). Other institutions might joint at a later stage.

Role in the project

The CNRS institutions and its joint research units will actively contribute to the organisational work packages WP1-3, the operational work packages WP4-6, and the strategic work packages WP7-8. CNRS will coordinate the work package "ACTRIS Service Provision" (WP6).

Principal personnel involved

Dr. Paolo Laj (male) is a senior scientist at the Geophysical Observatory of Grenoble (OSUG) and LGGE. He is the acting co-coordinator of ACTRIS-2 and ENVRIplus, and has been involved in a number of EU projects since FP4 (ACCENT, EUCAARI, CIME, ACE2, EUSAAR, PEGASOS, ACTRIS). He is author or co-author more than 120 research articles in the field of aerosols and clouds and their interactions. He is a member of WMO expert group on aerosols. He will be participating in the coordination team of ACTRIS PPP and will be involved in WP1-8. Dr. Paolo Laj works 75 % at CNRS and 25 % at University of Helsinki, Finalnd.

Dr. Sabine Philippin (female) is European project manager based at CNRS-LAMP and has been involved in the management of EU-funded projects and as PI of transnational activities since 2004 (ACCENT FP6, EUSAAR FP6, ACTRIS FP7, ACTRIS-2 H2020, ENVRIplus H2020). She has a background in atmospheric sciences with experience in aerosol characterization and near-surface measurements. She will be participating in the coordination team of ACTRIS PPP and will be involved in WP1-8.

Dr. Elisabeth Kohler (female) is a senior project manager. As head of the Office for European and international cooperation at CNRS-INSU, she has been involved in several EU funded projects, especially related to the governance of research infrastructures and data management (ICOS, EPOS, CTA, ASTERICS) since FP6. She will be involved in WP1, 2, 3.

Dr. Martial Haefflin (male) is a research scientist with 25-year experience in cloud radiative effects, initially with the NASA Langley Research Center (USA), contributing to the US Atmospheric Radiation Measurement program, and now with CNRS-IPSL (France) since 2002. He is the Director of the SIRTA atmospheric observatory that hosts two ACTRIS calibration centers and provides ACTRIS TNA, also Deputy Director of IPSL for Earth Observations, and scientific coordinator of the French network of atmospheric observatories dedicated to aerosol, cloud and trace gas observations (SOERE ATMOS; 90 persons). He has a 15-year record of contribution to EU projects (EARLINET, CLOUDNET, ACTRIS). He is a member of the EU TO-PROF COST program management committee, and chair of the automatic Lidar and ceilometer working group (30 persons). He is the author and co-author of 80 peer-reviewed articles. He will participate in WP4, 5, 6, 7.

Dr. Philippe Goloub (male) is full professor at Lille University since 2003. In LOA, he focuses research activities on aerosols and clouds remote sensing from both space and ground-based measurements, with emphasis on polarization. He is in charge of the PHOTONS/AERONET sunphotometer network, national observatory devoted to aerosol characterization and monitoring since 2001 and leader of AERONET-EUROPE TNA during ACTRIS I3 in FP7 and ACTRIS-2. Since 2013, he has been leading the Aerosol Radiation Interaction group (30 persons) and the observation activities in the labex CaPPA project (Chemical and Physical Processes in the Atmosphere, http://labex-cappa.univ-lille1.fr/). He is in charge of the atmospheric platform (fixed and mobile) operated by LOA and PI of the Lille EARLINET site. Co-author of more than 90 publications in peer reviewed journals, he was/is involved is many bilateral collaborative projects with Spain, China, Belarus, Ukraine. He will participate in WP4, 6, 7.

Anne Priem (female) is administrative and financial manager at CNRS-LOA. She has been involved in European funded projects and TNA activities' management since FP7 (DAEDALUS FP5 – GEMS FP6 – ACTRIS FP7 and ACTRIS-2 H2020). She will be involved in WP2, 3.

Dr Jean-Pierre Cammas (male) is Research Director at CNRS and develops research on atmospheric composition, dynamics and long range transport of pollutants, and stratosphere-troposphere exchanges. As the head of OSUR, he is in charge of managing infrastructures for long term observations in the strategic area of La Réunion (South West Indian Ocean), which includes the Maïdo atmospheric observatory. He is (co-) author of more than 85 publications in peer-review journals. He will be participating in the Work Package on National Facilities in ACTRIS PPP. He will be involved in WP5, 6, 7.

Dr. Karine Sellegri (female), CNRS-LaMP researcher, is specialized in aerosol formation and aerosol-cloud interactions. She is leading the Physical, Chemical and Biological Processes in the Cloud Atmosphere group since 2012 (20 persons), and in charge of the aerosol monitoring program at the PUY station since 2008. She has

participated in 5 EU projects (EUSAAR FP6, ACTRIS FP7, EUCAARI FP7, ACTRIS-2 H2020, ENVRIplus H2020). She is author and co-author of more than 80 peer-reviewed articles. She will participate in WP4, 5.

Dr. Evelyn Freney (female), CNRS-LaMP researcher, whose research focuses on aerosol chemical and physical properties. She is responsible for on-line aerosol chemistry measurements at the Puy de Dome (PUY) station and is co-responsible of the Aerosol Chemical Monitor Calibration Centre (ACMCC) within ACTRIS-2. She is author or co-author of 17 publications on aerosol properties. She will be involved in WP4, 6.

Dr. Valérie Gros (female), CNRS-LSCE researcher, is working in the field of atmospheric chemistry since almost 20 years and is leading the group "Experimental Atmospheric Chemistry" at LSCE since 2006. She is responsible of the chemistry (gas and particulate phase) measurements at the SIRTA station and is co-responsible of the Aerosol chemistry calibration center. She is author or co-author of 60 peer-reviewed articles. She has participated in several EU projects and supervised 6 PhD theses. She will be involved in WP4, 6.

Dr. Sophie Godin-Beekmann (female) is Research Director at CNRS and specialized in atmospheric ozone and lidar measurements of atmospheric species. She is the director of OVSQ, in charge of long-term observations of atmospheric composition within NDACC and ICOS. (Co-)author of more than 110 publications, she is a member of the Scientific Advisory Group on ozone for WMO, the Secretary of the International Ozone Commission and honorary member of the International Union of Geodesy and Geophysics. She will participate in WP5, 7.

Dr. Céline Mari (female), is Director of Research at CNRS, leading the Laboratoire d'Aerologie in Toulouse. She is specialized in the coupling between dynamics and atmospheric chemistry, cloud convective systems, fire-atmosphere interactions and modelling. She is author and co-authors of 50 peer-reviewed articles. She has been involved in several EU projects (e.g. FP6/AMMA and the current FP7/DACCIWA in West Africa). She will be involved in WP5, 7.

Further expertise will be provided by the following persons linked to French associated partners in the project: **Nicole Papineau (female)** is deputy director à IPSL since 2010. She has a "Doctorat d'Etat" in spectroscopy en 1985. She joined the French Space Agency, CNES in 1992 where she has been successfully Program Manager for Middle atmosphere, climate or oceanographic program. She has also been Deputy Director for Research at Météo France for 2 years and Scientific deputy director at CNRS -INSU for oceanographic and Atmosphere domain, managing 30 laboratories and programs for 4 years. She is the Director of the AERIS French data and Services Center. **Stéphane Sauvage (male)** is associated professor at Atmospheric Sciences and Environmental Engineering department of EMD. His research activities focus on ground-based observations of atmospheric reactive gases. He is also the PI of the French EMEP monitoring network. He is (co-) author of 35 peer-reviewed articles in the fields of VOC measurement methods, trend analysis, and source apportionment. **Olivier Favez (male)**, leading research activities on the aerosol chemistry at INERIS and for the French reference laboratory for air quality monitoring (LCSQA) since 2009 and co-leading the ACMCC, will be mainly involved within WP4.

Relevant publications

1. Baray J.-L., Y. Courcoux, P. Keckhut, T. Portafaix, P. Tulet, J.-P. Cammas, A. Hauchecorne, S. Godin Beekmann, M. De Mazière, C. Hermans, F. Desmet, K. Sellegri, A. Colomb, M. Ramonet, J. Sciare, C. Vuillemin, C. Hoareau, D. Dionisi, V. Duflot, H. Vérèmes, J. Porteneuve, F. Gabarrot, T. Gaudo, J.-M. Metzger, G. Payen, J. Leclair de Bellevue, C. Barthe, F. Posny, P. Ricaud, A. Abchiche, and R. Delmas, (2013), "Maïdo observatory: a new high-altitude station facility at Reunion Island (21° S, 55° E) for long-term atmospheric remote sensing and in situ measurements", Atmos. Meas. Tech., 6, 2865-2877.
2. Dubovik, O., T. Lapyonok, P. Litvinov, M. Herman, D. Fuertes, F. Ducos, A. Lopatin, A. Chaikovsky, B. Torres, Y. Derimian, X. Huang, M. Aspetsberger, and C. Federspiel, GRASP: a versatile algorithm for characterizing the atmosphere, 2014, SPIE Newsroom. DOI: 10.1117/2.1201408.005558
3. Haeffelin, M., T. Bergot, T. Elias, R. Tardif, D. Carrer, P. Chazette, M. Colomb, P. Drobinski, E. Dupont, J-C. Dupont, L. Gomes, L. Musson-Genon, C. Pietras, A. Plana-Fattori, A. Protat, J. Rangognio, J-C. Raut, S. Rémy, D. Richard, J. Sciare, X. Zhang, 2010. PARISFOG: Shedding New Light on Fog Physical Processes. Bull. Amer. Meteor. Soc., 91, 767-783. doi: 10.1175/2009BAMS2671.1
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5. Guyot, G. ; Gourbeyre, C. ; Febvre, G. ; Shcherbakov, V. ; Burnet, F. ; Dupont, J-C ; Sellegri, K. Jourdan, O. 2015 , Quantitative evaluation of seven optical sensors for cloud microphysical measurements at the

Puy-de-Dôme Observatory, France Atmos. Meas. Tech. Vol. 8 , p. 4347-4367 DOI 10.5194/amt-8-4347-2015 (EGU)

Relevant projects

1. EU H2020 project ACTRIS 2 (Aerosol, Clouds, and Trace gases Research Infrastructure), Grant agreement n° 654109 (2015-2019).
2. EU H2020 project ENVRIPLUS (Environmental Research Infrastructures Providing Shared Solutions for Science and Society), Grant agreement n° 654182 (2015-2019).
3. EU FP7 project ACTRIS (Aerosol, Clouds, and Trace gases Research Infrastructure network). Contract n° 262254 (2011-2015).
4. ANR (French National Agency for Research) Infra-Atmo Structuration de la composante nationale d'une Infrastructure de Recherche Européenne pour les Sciences Atmosphériques. ANR project ANR-14-CE01-0015, 2015-2017
5. EU FP7 project BACCHUS Impact of Biogenic versus Anthropogenic emissions on Clouds and Climate: towards a Holistic UnderStanding, Contract N° 49 603445 (2014-2017)

Significant infrastructures

CNRS contributes to the project with a large number of significant infrastructures including data centre, calibrations facilities, observational sites and exploratory platforms both in French mainland in the French overseas territories and in association to third country partners. It is expected that France will participate to 5 Central Facilities and will involve between 5 and 10 national facilities in ACTRIS.

4.1.5 National Instiute of R&D for Optoelectronics (INOE)

National Institute of R&D for Optoelectronics (INOE) was established in 1996 and is involved in fundamental and applied research in optoelectronics, analytical chemistry, and high pressure physics. INOE is a non-profit, independent research institute, under the coordination of the Romanian Ministry for Education. The five departments in INOE focus on different applications of optoelectronics (new materials, laser-based instruments, art restoration, bio-medical and environment applications). The Remote Sensing Department operates a complex research infrastructure and has multidisciplinary expertise spanning from laboratory/in-situ chemical analysis to Earth Observation (EO) techniques and applications. It contributes to the joint European and global climatological database as part of international networks (EARLINET, AERONET, MWRNET, ACTRIS), coordinates the Romanian Atmospheric 3D research Observatory (RADO), and leads the Romanian initiative for ACTRIS research infrastructure ACTRIS-RO.

Role in the project

INOE is the national representative of the Romanian's RPOs involved in ACTRIS activities. In this respect, INOE participates to WPs 1-8, ensuring the flow of information between the ACTRIS-RO consortium and European-level ACTRIS bodies, presenting the point of view and supporting the interests of the Romanian organizations and facilities. INOE is also leading WP4 "ACTRIS Central Facilities", which is in charge with the development of the concept, selection of the sites and testing the provision of the core services by the CFs.

Principal personnel involved

Dr. Doina Nicolae (female) is the WP4 leader and the national representative for Romania in ACTRIS. She is the head of the Remote Sensing Department in INOE, senior scientist, PI of EARLINET, ACTRIS and AERONET Bucharest station, member of the ICLAS and EARLINET management committee, expert evaluator for FP7, and an expert to ISO and COST actions, (co)author for 4 books/book chapters, 55 ISI papers (109 citations), and 41 papers in peer review journals. She is also involved in coordination of numerous national and international research projects (FP7-REGPOT-2008-1, ESA-NATALI, ESA-MULTIPLY, HORIZON2020-ECARS). Main achievements include the development of an atmospheric research super site and its integration into relevant European and global networks (EARLINET, AERONET, MWRNET, ACTRIS, GALION), as well as the setup of the Romanian Atmospheric 3D research Observatory (RADO).

Dr. Livio Belegante (male) is the leader of the Romanian node in the Lidar Calibration Centre. He is a senior scientist, engineer at INOE. His research activity covers experimental and theoretical research: experimental campaigns for environmental studies and system inter-comparisons, intensive measurements during special environmental episodes using multi-wavelength Raman Lidar with depolarization channels. He is also responsible for measurements and quality assurance in the framework of EARLINET for Bucharest site.

Relevant publications

1. Wandinger, U., Freudenthaler, V., Baars, H., Amodeo, A., Engelmann, R., Mattis, I., Groß, S., Pappalardo, G., Giunta, A., D'Amico, G., Chaikovsky, A., Osipenko, F., Slesar, A., Nicolae, D., Belegante, L., Talianu, C., Serikov, I., Linné, H., Jansen, F., Apituley, A., Wilson, K. M., de Graaf, M., Trickl, T., Giehl, H., Adam, M., Comerón, A., Muñoz-Porcar, C., Rocadenbosch, F., Sicard, M., Tomás, S., Lange, D., Kumar, D., Pujadas, M., Molero, F., Fernández, A. J., Alados-Arboledas, L., Bravo-Aranda, J. A., Navas-Guzmán, F., Guerrero-Rascado, J. L., Granados-Muñoz, M. J., Preißler, J., Wagner, F., Gausa, M., Grigorov, I., Stoyanov, D., Iarlori, M., Rizi, V., Spinelli, N., Boselli, A., Wang, X., Lo Feudo, T., Perrone, M. R., De Tomasi, F., and Burlizzi, P.: EARLINET instrument intercomparison campaigns: overview on strategy and results, *Atmos. Meas. Tech.*, 9, 1001-1023, doi:10.5194/amt-9-1001-2016, 2016.

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Muñoz, A., Muñoz Porcar, C., Navas-Guzmán, F., Nicolae, D., Nisantzi, A., Papagiannopoulos, N., Papayannis, A., Pereira, S., Preißler, J., Pujadas, M., Rizi, V., Rocadenbosch, F., Sellegri, K., Simeonov, V., Tsaknakis, G., Wagner, F., and Pappalardo, G.: EARLINET: potential operationality of a research network, *Atmos. Meas. Tech.*, 8, 4587-4613, doi:10.5194/amt-8-4587-2015, 2015.

4. Wang, Y., Sartelet, K. N., Bocquet, M., Chazette, P., Sicard, M., D'Amico, G., Léon, J. F., Alados-Arboledas, L., Amodeo, A., Augustin, P., Bach, J., Belegante, L., Binietoglou, I., Bush, X., Comerón, A., Delbarre, H., García-Vízcaino, D., Guerrero-Rascado, J. L., Hervo, M., Iarlori, M., Kokkalis, P., Lange, D., Molero, F., Montoux, N., Muñoz, A., Muñoz, C., Nicolae, D., Papayannis, A., Pappalardo, G., Preissler, J., Rizi, V., Rocadenbosch, F., Sellegri, K., Wagner, F., and Dulac, F.: Assimilation of lidar signals: application to aerosol forecasting in the western Mediterranean basin, *Atmos. Chem. Phys.*, 14, 12031-12053, doi:10.5194/acp-14-12031-2014, 2014.
5. Nicolae, D., A. Nemuc, D. Müller, C. Talianu, J. Vasilescu, L. Belegante, and A. Kolgotin (2013), Characterization of fresh and aged biomass burning events using multiwavelength Raman lidar and mass spectrometry, *J. Geophys. Res. Atmos.*, 118, 2956–2965, doi:10.1002/jgrd.50324

Relevant projects

1. H2020-TWINN-2015, ECARS - East European Centre for Atmospheric Remote Sensing, 2016 -2019
2. H2020-INFRAIA-2014-2015, ACTRIS-2 - Aerosols, Clouds, and Trace gases Research InfraStructure, 2015 - 2019
3. ESA 4000112373/14/NL/CT, MULTIPLY - Development of a European HSRL airborne facility, 2014-2017
4. FP7-INFRASTRUCTURES-2010-1, ACTRIS - Aerosols, Clouds, and Trace gases Research Infrastructure Network, 2011-2015
5. FP7-PEOPLE-2011-ITN, 289923, ITARS– Initial training for atmospheric remote sensing, 2012-2016

Significant infrastructures

Together with its national partners (associated partners to this proposal), INOE brings to ACTRIS three potential ground-based observation sites distributed over the Romanian territory, two facilities part of the Lidar Calibration Centre, a simulation chamber, and an airborne atmospheric research facility. The most advanced observation site is operated by INOE in SE Romania, and includes active and passive remote sensing, as well as in situ instruments (aerosol, water vapor and ozone lidars, sun and lunar photometers, C-ToF Aerosol Mass Spectrometer, Aerosol Chemical Speciation Monitor, Aerodynamic Particle Sizer, Aethalometer, Nephelometer, PANDORA 2S, Microwave radiometer). These instruments are used for several years to provide high-quality data products to ACTRIS aerosol near-surface and aerosol profiling databases. INOE also hosts two of the ACTRIS Lidar Calibration Centre facilities, the component characterization laboratory (LiCoTest) and the training facility (LiCalTrain). The other two observation sites are instrumented with (at least) multiwavelength lidars and sun photometers, and are located in: a) Central Romania, operated by the "Babes-Bolyai" University of Cluj-Napoca, and b) North-East Romania, operated by "Al. I. Cuza" University of Iasi.

The simulation chamber (ESC-Q-UAIC) is part of EUROCHAMP, and is operated by "Al. I. Cuza" University of Iasi. The chamber is equipped with a White type multiple-reflection mirrors that leads to an optical path length of (492 ± 0.2) m for sensitive in situ long path absorption monitoring of reactants and products in IR region. State-of-the-art instruments (PTR-MS, Proton Transfer Reaction Time of Flight Mass Spectrometer, HR-ToF-AMS, High Resolution Aerosol Mass Spectrometer, and SMPS Scanning Mobility Particle Sizer) and conventional analytical equipment (GC-FID/MS with TDU, comprehensive GC×GC-FID/MS, HPLC-DAD-FD, and HPLC-ToF-MS) can be used for off- and on-line analyses.

The airborne facility which is intended to be used as an ACTRIS exploratory platform, is equipped with in situ instrumentation for probing aerosols and clouds (a Cloud, Aerosol and Precipitation Spectrometer, and an Hawkeye Cloud Particle and Precipitation Probe) and will carry, in the near future, the airborne multi wavelength High Spectral Resolution Lidar developed in the frame of the ESA/ESTEC contract MULTIPLY. The ATMOSLAB aircraft is operated by the National Institute of Aerospace Research "ELIE CARAFOLI" in Bucharest.

4.1.6 Český Hydrometeorologický Ústav (CHMI)

The task of Czech Hydrometeorological Institute (CHMI) is to carry out the function of the Czech Republic's central governmental institution for the fields of air quality, hydrology, water quality, climatology and meteorology. The institute is structured into 3 main divisions (meteorology, hydrology and air quality protection) and 5 regional branch offices. The activities of the CHMI are carried out by a staff of approximately 800 people. CHMI brings into ACTRIS the Košetice Observatory, which was established in 1988 and has been in continuous operation for more than 25 years being part of many European anf global networks (ACTRIS-EUSAAR, EMEP, ICP-IM, GAW)

Role in the project

As a direct beneficiary to ACTRIS PPP, CHMI participates in WPs 1, 4, 5 and 7 with at least 4 PM in each. Even though CHMI does not plan to bring Central Facility components to ACTRIS, it represents the user dimension in WP4. CHMI owns and operates Košetice Observatory, the core of the ACTRIS-CZ research infrastructure which CHMI is leading.

Principal personnel involved

Dr. Milan Vána (male), Ph.D.: Education: 1996 - Ph.D. Degree - Physical geography and geo-ecology, specialization climatology, (Charles University, Faculty of Science, Prague). He is the head of Košetice Observatory since 1994, Global Change Research Centre AS CR, senior researcher at CHMI 2011-2016. He is also the National contact person in ACTRIS and ACTRIS-2 project, Contact person for the Czech Republic in GAW (Global Atmosphere Watch) programme, National Focal Point for the Czech Republic in EMEP (TFMM and HTAP) and in ICP-IM./WGE He participated in a number of research projects related to atmospheric monitoring and research including EUSAAR and ACTRIS. His main fields of interest are Monitoring and assessment of air quality at the regional scale, long-range transport of air pollution, atmospheric aerosols, global climate change, tropospheric ozone.

Relevant publications

1. P. Shahpoury, G. Lammel, A. Holubová Šmejkalová, J. Klánová, P. Přibylová, And M. Váňa: Polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and chlorinated pesticides in background air in central Europe – investigating parameters affecting wet scavenging of polycyclic aromatic hydrocarbons. Atmos. Chem. Phys., 15, 1795–1805, 2015, doi:10.5194/acp-15-1795-2015
2. C.C. Hoerger, A.Claude, C. Plass-Duelmer, S. Reimann, E. Eckart, R. Steinbrecher, J. Aalto, J. Arduini, N. Bonnaire, J.N.Cape, A. Colomb, R. Connolly, J. Diskova, P. Dumitrean, C. Ehlers, V. Gros, H. Hakola, M. Hill, J.R. Hopkins, J. Jager, R. Junek, M.K. Kajos, D. Klemp, M. Leucher, A.A.Lewis, N. Locoge, M. Maione, D. Martin, K. Michl, E. Niemitz, S, O´Doherty, P. Perez Ballesta, T.M. Ruuskanen, S. Sauvage, N. Schmidbauer, T.G. Spain, E. Straube, M.Vana, M.K. Vollmer, R. Wegner, A. Wegner: ACTRIS non-methane hydrocarbon interscomparison experiment in Europe to support WMO GAW and EMEP observation networks. Atmos.Meas.Tech, 8, 2715-2736, 2015, doi: 10.5194/amt-8-2715-2015
3. W. Aas, S. Tsyro, E. Bieber, R. Bergstrom, D. Ceburnis, T. Ellermann, H. Fagerli, M. Frolich, R. Gehrig, U. Makkonen, E. Nemitz, R. Otjes, N. Perez, C. Perrino, A. S. H. Prevot, J.-P. Putaud, D. Simpson, G. Spindler, M. Vana, And K. E. Yttri. 2012. Lessons learnt from the first EMEP intensive measurement periods. Atmos. Chem. Phys., 12, 8073–8094, 2012
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5. Váňa, M., Dvorská, A. et al., 2014. Košetice Observatory – 25 years. Praha: ČHMÚ. 92 s. ISBN 978-80-87577-40-0.

Relevant projects

1. EUSAAR (European Supersites for Atmospheric Aerosol Research, EU-funded I3 - Integrated Infrastructures Initiatives) project carried out in the framework of the specific research and technological development programme "Structuring the European Research Area – Support for Research Infrastructures", investigation period: 2006-2011, associated partner
2. ACTRIS (Aerosols, Clouds, and Trace Gases Research Infrastructure Network, INFRA-2010-1.1.16: Research Infrastructures for Atmospheric Research), investigation period: 2011-2015, contractor for the Czech Republic.

3. ACTRIS-2 (Aerosols, Clouds, and Trace gases Research Infrastructure Network), H2020: 2015 – 2019, Grant No. 654109, contractor for the Czech Republic
4. ACTRIS – participation of the Czech Republic (ACTRIS-CZ), Grant No. LM2015037. The Ministry of Education, Youth and Sports of the Czech Republic, 2016-2019

Significant infrastructures

The Košetice Observatory The Observatory was established as a station specializing in the long-term air quality monitoring and assessment at the background scale of the Czech Republic in 1988. The observatory has been involved in EUSAAR (2006-2011), ACTRIS (2011-2015) and currently ACTRIS-2 (2015-1019) projects. Moreover, Košetice Observatory represents the Czech Republic in long-term monitoring programmes under CLRTAP (EMEP - LEVEL 2 station and ICP-IM and WMO (GAW regional station).

Within the Air Quality Protection Department, the Observatory is supported by the accredited Central Imission Labs in Prague - Libuš. Košetice air quality data are stored in the ISKO database (Air Quality Information System).

Station Ústí nad Labem – monitoring of atmospheric aerosols

Station Tušimice – planed lidar installation in 2017

[ACTRIS PPP]

4.1.7 Leibniz-Institut für Troposphärenforschung (TROPOS)

The Leibniz Institute for Tropospheric Research (TROPOS, www.tropos.de) is an independent research institution with about 150 employees and is member of the Leibniz Association, one of the German non-university research organizations. The institute has a well-defined research profile with focus on aerosol and clouds. The TROPOS expertise ranges from physical and chemical laboratory studies, large field experiments in which in-situ and remote-sensing techniques from ground and on aircraft are applied, to numerical modelling of aerosol and cloud processes. TROPOS has been an active or leading partner in many international projects related to atmospheric clouds and aerosols in the research fields of air pollution and climate. The TROPOS Research Station Melpitz is jointly operated by the Departments of Atmospheric Chemistry, Experimental Aerosol and Cloud Microphysics, and Remote Sensing of Atmospheric Processes, which all contribute to ACTRIS.

TROPOS is a world-leading centre for aerosol and cloud in-situ and remote observations. Over the past two decades, it has contributed to the field with new and innovative technologies and methodologies, e.g., for in-situ measurements of particle size distribution, humidity-dependent and absorption properties, and mixing state of aerosols as well as for remote sensing of particle optical and microphysical properties with multi-wavelength Raman and polarization lidars and of cloud-aerosol interactions with combined lidar and radar profiling techniques. The institute has been involved in a large number of international field studies and performs continuous observations at stations worldwide. TROPOS is an active member of EARLINET since 2000 and of Cloudnet since 2011 and contributes to the respective ACTRIS databases on the four-dimensional distribution of aerosols and clouds over Europe. At the ACTRIS Melpitz station, a more than 20-year-long record of near-surface aerosol and trace-gas data has been established. The institute also conducts measurements at GAW stations such as Cape Verde Observatory, Point Barrow, and Danum Valley and within the German Ultrafine Aerosol Network (GUAN), which all deliver data to the World Data Centre for Aerosols at NILU, Norway. All instruments are integrated in the ACTRIS quality-assurance activities and participate in the regular round-robin tests, site inter-comparisons, and internal quality checks. Furthermore, TROPOS hosts the World Calibration Centre for Aerosol Physics (WCCAP) of the World Meteorological Organization – Global Atmosphere Watch program (WMO-GAW), which is responsible for the quality assurance of microphysical aerosol parameters in the networks GAE, ACTRIS, and GUAN. TROPOS operates two simulation chambers, the Leipziger Aerosolkammer (LEAK) and the Leipzig Aerosol and Cloud Interaction Simulator (LACIS), to study chemical and physical aerosol and cloud processes under controlled conditions. Both chambers were active members in the EU infrastructure projects EUROCHAMP and EUROCHAMP-2.

Within the current ACTRIS-2 project, TROPOS is actively involved in all networking and joint research activities related to aerosol and trace-gas in-situ measurements and vertical profiling of aerosol and clouds. In ACTRIS-2, TROPOS leads NA2 on Aerosol and Cloud Profiling and coordinates the European Centre for Aerosol Calibration. In addition, TNA to the research station Melpitz is provided.

Role in the project

TROPOS coordinates the German activities in ACTRIS. In this role, it will actively contribute to WP1, WP2, and WP3 of the ACTRIS PPP. TROPOS will lead WP5 and thus guide the work on the standardization and labelling procedures for the ACTRIS National Facilities, in close collaboration with the other WPs. In WP4, TROPOS will contribute to the definition of ACTRIS Central Facilities based on experience with the European Centre for Aerosol Calibration, but concurrently considering the other German calibration centres. TROPOS will also participate in the discussion on new Central Facilities and technologies in WP7.

Principal personnel involved

Dr. Ulla Wandinger (female) is senior research scientist in the Remote Sensing of Atmospheric Processes Department of TROPOS and has gained >25 years of experience in aerosol and cloud remote observations. She has actively contributed to the establishment of EARLINET since 2000 and has been working on the development of space-borne active remote sensing missions for ESA. In ACTRIS she had been responsible for the JRA on "Lidar and Sunphotometer". In ACTRIS-2 she leads NA2 on "Aerosol and Cloud Profiling". Ulla Wandinger has published >80 articles (h-factor 40). She is member of the ACTRIS Scientific Steering Committee, the EARLINET Council, and the ESA-JAXA EarthCARE Joint Mission Advisory Group.

Prof. Dr. Alfred Wiedensohler (male) is head of the Department of Experimental Aerosol and Cloud Microphysics and the Aerosol Working Group of TROPOS. He also leads the World Calibration Centre for Aerosol Physics of WMO-GAW. He has gained >30 years of experience in aerosol in-situ technology, atmospheric process studies, and long-term observations. In ACTRIS he was responsible for the NA on "In-situ chemical, physical and optical properties of aerosols" and in ACTRIS-2 he leads the European Centre for Aerosol Calibration. He has

published >300 articles (h-factor 60). Prof. Wiedensohler is member of the WMO-GAW Scientific Advisory Group and served in the Scientific Steering Committees of ACCENT, EUSAAR, EUCAARI, and ACTRIS.

Dr. Markus Hermann (male) is deputy group leader of the Aerosol Working Group in the Department of Experimental Aerosol and Cloud Microphysics. He is an expert for airborne aerosol instrumentation and has developed small and light particle instruments for that purpose. His scientific focus is on in-situ particle measurements in the free troposphere, where he has more than 18 years of experience. Since more than a decade, he is the PI for the particle number and size distribution measurements in the IAGOS-CARIBIC European Research Infrastructure. Therefore, he has experience with preparatory phase projects. Markus Hermann is member of the Scientific Steering Committees of the German research aircraft HALO and of SSiRC (SPARC activity) and chairs the TROPOS Scientific Council.

Dr. Frank Stratmann (male) is head of the Experimental Aerosol and Cloud Microphysics Department and the Cloud Working Group of TROPOS. He is an internationally well-recognized expert in the field of aerosol cloud interactions in general, and atmospheric ice nucleation and cloud condensation nucleus activation in particular. His working group investigates aerosol-cloud interactions in both laboratory and field. His group hosts two internationally well-recognized aerosol-cloud-interaction-related infrastructures (LACIS and ACTOS, the Airborne Cloud Turbulence Observation System) and is currently extending its research activities towards atmospheric INP measurements.

Prof. Dr. Hartmut Herrmann (male) is head of the Department of Atmospheric Chemistry. His research intends to understand the tropospheric multiphase system. Model development is based on experimental work in the laboratory and in the field. The Lab work utilises state-of-the-art physical and analytical chemistry methods to study gas phase, aqueous phase, organic phase, surface, and, all together, multiphase phenomena. Field work aims to understand chemical processing and composition of tropospheric particles, clouds, fog, and rain in the complex interplay of all compartments involved. The LEAK chamber and the Research Station Melpitz are used as important infrastructures. Hartmut Herrmann published more than 230 articles in peer-reviewed journals.

Dr. Olaf Böge (male) is senior research scientist in the Atmospheric Chemistry Department of TROPOS. He has gained more than 20 years of experience in laboratory studies on atmospheric particle formation and atmospheric gas-phase reactions. Since more than 10 years, he has been involved in the simulation chamber studies at the TROPOS chamber LEAK. He published more than 50 articles in peer-reviewed journals.

Dr. Gerald Spindler (male) is senior research scientist in the Department of Atmospheric Chemistry and responsible for the Research Station Melpitz. Since 1986 he has been strongly engaged in atmospheric chemistry. He has initiated the buildup of the Research Station Melpitz in 1992 in the framework of a national project and started with the measurement of dry deposition fluxes in a strongly polluted troposphere. As a result of his engagement in different national and international projects, a long-time record for PM and trace gases has been established. Gerald Spindler is responsible for the Melpitz site and the chemical detection of carbonaceous species (OC/EC) with thermo-graphic and thermo-optical methods at TROPOS. He published more than 50 articles in peer-reviewed journals.

Relevant publications

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3. Spindler, G., Grüner, A., Müller, K., Schlimper, S., and Herrmann, H.: Long-time size-segregated particle (PM10, PM2.5, PM1) characterization study at Melpitz - Influence of air mass inflow, weather conditions and season. J. Atmos. Chem., 70, 165-195, doi:10.1007/s10874-013-9263-8, 2013.
4. Wandinger, U., Freudenthaler, V., Baars, H., Amodeo, A., Engelmann, R., Mattis, I., Groß, S., Pappalardo, G., Giunta, A., D'Amico, G., Chaikovsky, A., Osipenko, F., Slesar, A., Nicolae, D., Belegante, L., Talianu, C., Serikov, I., Linné, H., Jansen, F., Apituley, A., Wilson, K. M., de Graaf, M., Trickl, T., Giehl, H., Adam, M., Comerón, A., Muñoz-Porcar, C., Rocadenbosch, F., Sicard, M., Tomás, S., Lange, D., Kumar, D., Pujadas, M., Molero, F., Fernández, A. J., Alados-Arboledas, L., Bravo-Aranda, J. A., Navas-Guzmán, F., Guerrero-Rascado, J. L., Granados-Muñoz, M. J., Preißler, J., Wagner, F., Gausa, M., Grigorov, I., Stoyanov, D., Iarlori, M., Rizi, V., Spinelli, N., Boselli, A., Wang, X., Lo Feudo, T., Perrone, M. R., De

Tomasi, F., and Burlizzi, P.: EARLINET instrument intercomparison campaigns: overview on strategy and results, Atmos. Meas. Tech., 9, 1001-1023, doi:10.5194/amt-9-1001-2016, 2016.

5. Wiedensohler, A., Birmili, W., Nowak, A., Sonntag, A., Weinhold, K., Merkel, M., Wehner, B., Tuch, T., Pfeifer, S., Fiebig, M., Fjäraa, A. M., Asmi, E., Sellegri, K., Depuy, R., Venzac, H., Villani, P., Laj, P., Aalto, P., Ogren, J. A., Swietlicki, E., Williams, P., Roldin, P., Quincey, P., Hüglin, C., Fierz-Schmidhauser, R., Gysel, M., Weingartner, E., Riccobono, F., Santos, S., Grüning, C., Faloon, K., Beddows, D., Harrison, R., Monahan, C., Jennings, S. G., O'Dowd, C. D., Marinoni, A., Horn, H.-G., Keck, L., Jiang, J., Scheckman, J., McMurry, P. H., Deng, Z., Zhao, C. S., Moerman, M., Henzing, B., de Leeuw, G., Löschau, G., and Bastian, S.: Mobility particle size spectrometers: harmonization of technical standards and data structure to facilitate high quality long-term observations of atmospheric particle number size distributions, Atmos. Meas. Tech., 5, 657-685, doi:10.5194/amt-5-657-2012, 2012.

Relevant projects

1. Aerosols, Clouds, and Trace gases Research Infrastructure Network (ACTRIS-2), grant agreement No 654109, 2015-2019, Horizon 2020.
2. Aerosols, Clouds, and Trace gases Research Infrastructure Network (ACTRIS), grant agreement No 262254, 2011-2015, 7th Framework Programme.
3. European Simulation Chambers for Investigating Atmospheric Processes (EUROCHAMP-2), grant agreement No 228335, 2009-2013, 7th Framework Programme.
4. European Aerosol Research Lidar Network: Advanced Sustainable Observation System (EARLINET ASOS), grant agreement No 025991, 2006-2011, 6th Framework Programme.
5. European Supersites for Atmospheric Aerosol Research (EUSAAR), grant agreement No 026140, 2006-2011, 6th Framework Programme.

Significant infrastructures

European Centre for Aerosol Calibration (ECAC)

The European Centre for Aerosol Calibration is part of ACTRIS and consists of three facilities: the World Calibration Centre for Aerosol Physics (WCCAP) at TROPOS, the European Reference Laboratory for Air Pollution (ERLAP) in Ispra, Italy, and the Aerosol Chemical Monitor Calibration Centre (ACMCC) near Paris, France. These facilities are available for various calibration/intercomparison workshops, inter-laboratory comparisons, as well as on-site intercomparisons and audits. Since 2002, the aerosol group at TROPOS hosts the WCCAP in the framework of WMO-GAW, which is now also an ACTRIS aerosol calibration centre. From July 2015 to May 2016, 57 ACTRIS aerosol instruments were calibrated during 192 researcher working days at the WCCAP.

Research Station Melpitz

The site is situated in the rural background of the eastern German lowlands in Central Europe (12°56’E, 51°32’N, 86 m a.s.l.). Especially during winter, continental air masses arriving from easterly directions are influenced by long-range-transported anthropogenic emissions. The site is an ACTRIS and EMEP station. The existing size-segregated, long-term characterization of chemical and physical aerosol properties by offline methods in combination with chemical analysis for ions OC/EC and for specific organic tracers (e.g., PAK, alkanes, hopanes with CPP-GCMS, sugars and sugar alcohols with HPAEC-PAD) and state-of-the-art online methods (e.g., particle number and size distribution, aerosol absorption and scattering coefficients, aerosol mass spectra from HR-ToF-AMS, ACSM, CI-Api-ToF-MS and MARGA) provide a comprehensive dataset. With the possibility for profiling of aerosols, clouds, and atmospheric dynamics (multiwavelegth Raman lidar, Sun photometer, Doppler lidar, and cloud radar are currently applied on campaign basis, permanent deployment is planned for the future), Melpitz is a unique research infrastructure in Europe and a perfect site to study changes in atmospheric composition.

Leipzig Aerosol and Clouds Remote Observations System (LACROS)

This mobile exploratory platform is a combined Cloudnet/EARLINET/AERONET station. It consists of a 35-GHz cloud radar, a multiwavelength polarization Raman lidar, a ceilometer, a microwave radiometer, a sun photometer, and auxiliary instrumentation for measurements of radiation and atmospheric state parameters. The mobile facility is used for observations at the TROPOS sites in Leipzig and Melpitz as well as in field experiments at global hotspots. LACROS has been contributing to the German HD(CP)^2 project (High Definition Clouds and Precipitation for Climate Prediction) and will be deployed for a one-year campaign at Cyprus in 2016/17 to investigate cloud-aerosol interaction in the Eastern Mediterranean.

[ACTRIS PPP]

Stationary EARLINET/AERONET Leipzig site

TROPOS operates a stationary EARLINET multiwavelength polarization Raman lidar together with a standard AERONET site at its premises in Leipzig. The EARLINET lidar MARTHA (Multiwavelength Tropospheric Raman lidar for Temperature, Humidity, and Aerosol profiling) was the first multiwavelength Raman lidar implemented for long-term studies of optical and microphysical particle properties throughout the troposphere and lower stratosphere and served as a prototype for various technological developments in EARLINET.

Leipzig Aerosol and Cloud Interaction Simulator (LACIS)

The simulation chamber LACIS has been designed and successfully used for studying aerosol-cloud interaction and cloud microphysical processes. In particular, aerosol particle hygroscopic growth and the activation and freezing of cloud droplets have been studied. Currently, LACIS is being extended to investigate aerosol cloud interaction and cloud microphysical processes under well-defined turbulent flow conditions.

Leipziger Aerosolkammer (LEAK)

The simulation chamber LEAK is mainly used to study secondary organic aerosol (SOA) formation and particulate product formation. The experiments are performed at humidities up to 80%, allowing the study of multiphase chemical processes with deliquescent particles. LEAK can be operated as flow-through reactor, which has been proven useful for the study of HOMs/ELVOCs. LEAK belongs to the few chamber installations where these species are being investigated. The Leipzig Biomass Burning Facility as part of LEAK allows studying not only the emissions from biomass burning but also the processing (aging) of the emitted smoke.

4.1.8 Karlsruher Institut für Technologie (KIT)

The Institute for Meteorology and Climate Research (IMK) at the Karlsruhe Institute of Technology (KIT) with its four departments (about 250 FTE, 13 professorships) is strongly involved in atmospheric and climate research on the national and international level. IMK contributes to this research with its expertise covering tropospheric and stratospheric processes, biosphere-atmosphere interactions, atmos-pheric dynamics, cloud physics and trace gas transport processes. This diverse knowledge is complemented by long-term experience in QA/QC measures of selected climate relevant compounds and in remote sensing using satellites, surface-based as well as airborne remote sensing techniques (FTIR, RADAR, LIDAR). Long-term observation site, e.g. at Schneefernerhaus High-Altitude Research Station, the KIT Zugspitze lab, in Kiruna (Sweden), Izana (Spain) or in the TERENO Observatory Network as well as sophisticated mobile infrastructure (e.g. KIT-Cube) are used to assess and understand climate trends and changes on the different scales.

Role in the project

KIT contributes to WP1, WP2, WP4 and WP5 of the ACTRIS PPP. Based on the experience in the estab-lishment of large infrastructures/networks (as MOSES, TERENO, KIC InnoEnergy or EUROCHAMP) KIT will contribute to the development of governance, management and legal structures in the WP 1 and 2. In WP4, KIT will provide the experience as head of the WMO-GAW World Calibration Center for volatile organic compounds (WCC-VOC) for the framework development of the ACRIS central facilities. Last KIT will also participate in the discussion on ACTRIS exploratory platforms and observational sites in WP5. In this context KIT can take into account the long-term record in operating the AIDA exploratory cloud chamber and the diverse FTIR and Lidar observational sites around the world.

Principal personnel involved

Dr. Rainer Steinbrecher (male) will lead and coordinate the activities of the future ACTRIS CC-VOC. As Head of the WMO-GAW WCC for VOC he has a more than 10 years experience in implementing and maintaining QA/QC procedures in a global air observation network.

PD Dr. Ralf Sussmann (male) is head of the group "Atmospheric Variability and Trends" at IMK-IFU (Atmospheric Environmental Research) in Garmisch-Partenkirchen and member of the NDACC steering committee. He is responsible for all NDACC and EARLINET related field measurements at the site Zugspitze/Garmisch and their integration into ACTRIS.

Dr. Thomas Blumenstock (male) is head of the group "Ground-based remote sensing" at IMK-ASF (Atmospheric Trace Gases and Remote Sensing) in Karlsruhe and has more than 20 years of experience in ground-based infrared remote sensing. He is co-chair of the infrared working group of NDACC (Network for the Detection of Atmospheric Composition Change) and in charge of the integration of the field measurements in Karlsruhe, Kiruna and Tenerife in ACTRIS.

Dr. Ottmar Möhler (male) leads the group "aerosol-cloud processes" at IMK-AAF (Atmospheric Aerosol Research) and will be the scientist in charge for KIT in ACTRIS. He has long-term experience in cloud and aerosol research using the AIDA cloud chamber and is responsible for the implementation of this chamber in ACTRIS.

Peter Bremer -Diplom-Biologe, M. Technology- (male) will be responsible for the general management of KIT-activities in ACTRIS. As responsible manager for the Helmholtz-Programme "Atmosphere and Climate" he has a more than 15 year expertise in process co-ordination especially concerning large infrastructures.

Additional competence is integrated via the Helmholtz headquarter in Brussels, Belgian. **Annika Thies -lawyer-(female)** is director of the Helmholtz office in Brussels, Belgian. She has a very strong expertise in area of European research infrastructure strategy based on her work -by others- for the European commission.

Relevant publications

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non-methane hydrocarbon intercomparison experiment in Europe to support WMO GAW and EMEP observation networks. Atmospheric Measurement Techniques, 8(7), 2715-2736, 2015.

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Relevant projects

1. ACTRIS I3, 2011-2015, associated partner (contract no. 262254), continued as ACTRIS-2 IA, 2015-2019; associated partner (contract no. 654109)
2. WMO-GAW/WCC-VOC, 2002-2014, PI (UBA, contract KIT-no. 35101087)
3. EUROCHAMP 1 + 2, 2004-2013, PI (FP6/FP7, contract no. 505968/228335)
4. NORS, 2011-2014, PI (FP7, contract no. 284421)
5. EARLINET-ASOS, 2006-2011, PI (FP6, contract no. 025991)

Significant infrastructures

With the cloud simulation chamber AIDA, the Lidar-NDACC-system in Garmisch-Partenkirchen, the FTIR-NDACC measurement sites in Kiruna (Sweden), Izana (Spain), Karlsruhe, Garmisch-Partenkirchen and on the mountain Zugspitze, as well as the World Calibration Center for volatile organic compounds (WCC-VOC) KIT introduces some distinguished infrastructures in ACTRIS. With the support of the German national ACTRIS consortium ACTRIS-D these measurement systems and research platforms are adjusted to the specific challenges of this international consortium - besides novel pathways for soundly monitoring and simulation of long-term atmospheric changes are integrated.

Diverse field measurement sites contribute to ACTRIS with the operation of 2 aerosol lidar systems (Zugspitze & Garmisch) and 5 solar FTIR-spectrometer systems in Kiruna (Sweden), Karlsruhe (Germany), Zugspitze + Garmisch (both Germany) and Izana (Spain) measuring trace gas columns. These instruments are also part of the networks NDACC and EARLINET. KIT calibrates gas cells for the infrared working group in NDACC (Network for the Detection of Atmospheric Composition Change). The upgraded FTIR- and Lidar-measurement instruments provide in particular increased number of days of observation and optimized data quality by a novel multi-channel record of spectra, which will improve signal to noise ratio and thus time resolution.

Currently, the WCC-VOC with later implemented ACTRIS CC-VOC operates the necessary laboratory facilities (GC-FID, GC-MS, traceable gas standard, gas dilution systems, specific cleaning system for air sample canisters according approved WMO-GAW SOP, travel standards, round robin exercise equipment etc.) for ensuring high data and network compatibility for NMHC measurement within WMO-GAW and ACTRIS. A specific set of GC-FIDs and a GC-MS as well as standards and electro-polished stainless steel canisters are used in GAWTEC VOC training programs. Through empowering the WCC-VOC the QA in the European and global atmospheric observation network (WMO-GAW) for VOC will be strengthened and extended via ACTRIS. Thus the uncertainty of VOC data sets can be significantly reduced. The QA activities include measurements in the atmosphere at field sites and in simulation chambers as well as training of responsible persons.

[ACTRIS PPP]

The extended AIDA facility will be available for sophisticated process studies in the fields of aerosol, cloud and climate research. The AIDA infrastructure will also be used for the operation and test of field instruments, thereby providing a link between the field and simulation chamber parts of ACTRIC. The AIDA facility is suited for investigating chemical kinetics, aerosol chemistry, aerosol physics, and cloud microphysics under relevant atmospheric conditions within a wide range of temperature, pressure, humidity, and cooling rate. The combination of its size, temperature range, and comprehensive trace gas, aerosol, and cloud instrumentation provide a unique potential for ACTRIS.

4.1.9 National Observatory of Athens (NOA)

In ACTRIS PPP the Greek ACTRIS community will be represented by the National Observatory of Athens (NOA). The following Institutes will act as Associated Partners: University of Crete (UoC), National Technical University of Athens (NTUA), National Center for Scientific Research "DEMOKRITOS" (NCSR-D), Foundation for Research and Technology-Hellas (FORTH) and Aristotle University of Thessaloniki (AUTH).

The National Observatory of Athens (NOA) is the oldest Greek public research centre (founded in 1842). It hosts the UNESCO Chair for Natural Disasters and operates the Greek GEO Office (Group on Earth Observations).

NOA's Institute for Environmental Research & Sustainable Development (IERSD) maintains the longest and most complete climatologic record in Greece of meteorological (>120yrs) and solar radiation (>60yrs) parameters. It was also the first organisation that started a systematic study of urban pollution in Athens, in 1980. The Institute's research orientation includes: meteorological monitoring (260 stations), experimental research on air quality, atmospheric chemistry, aerosols and solar radiation, climate change research, synoptic and mesoscale atmospheric modeling, applied research (buildings, indoor air pollution, energy conservation, consultant services, e.t.c.), environmental management, surface and underground hydrology.

The Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) is one of the three institutes of the National Observatory of Athens, the oldest research institution in Greece. The main activities of the Institute involve basic and applied research in a number of topics in astrophysics, from distant galaxies to the solar neighbourhood, as well as ground based and space-borne remote sensing, earth observation and signal processing. The institute is also committed to outreach and science dissemination for the general public and operates a very popular visitor centre in Penteli.

Role in the project

NOA will coordinate WP8 "Socio-economic impact analysis" and contribute also to WP1 and WPs 5-7. NOA will provide its infrastructure, know-how and training in the following research and technological fields: remote sensing of aerosols from ground based stations, in-situ physicochemical aerosol characterisation, trace gases measurements and a fully equipped atmospheric chemistry laboratory.

Principal personnel involved

Prof. N. Mihalopoulos (male) is the Director of IERSD/NOA and Greek coordinator of ACTRIS PPP. He has more than 210 publications in peer reviewed journals devoted to atmospheric chemistry and physics (1 in Nature and 1 in Science; 8500 citations, h-index 48). His research activities focus on biogeochemical cycling of elements and aerosol physicochemical characterisation. He is responsible for the monitoring station of Finokalia and participated as PI or co-PI in several (more than 20) EU funded projects.

Dr. V. Amiridis (male) is a Senior Researcher at IAASARS/NOA and National delegate of the ministry for ACTRIS PPP. His main interests include research on the physical and optical properties of aerosols and their vertical distribution, with expertise in ground based lidar and satellite remote sensing techniques and methodologies. He has 65 publications in peer reviewed articles with 1360 citation (h-index 21), and has participated and/or co-ordinated as PI in national, ESA and EU projects.

Dr. E. Gerasopoulos (male) is a Research Director at IERSD/NOA. His main interests include research on the physical, optical and chemical properties of aerosols with expertise in in-situ and remote sensing techniques and methodologies. He has about 62 publications in peer reviewed articles concentrating about 1530 citation (h-index 23), and has participated and/or co-ordinated as PI in several national and EU projects.

Dr. Sevastianos Mirasgedis (male) is a Senior Researcher at NOA. He has been working for more than 20 years on issues of energy, climatic change and economy, focusing on their complex interdependences and interactions. He has been a Lead Author in the 4th and 5th IPCC Assessment Report on Climate Change as well as in Global Energy Assessment (2013), covering issues related to the building sector. He has participated in 36 Research Projects, acting as Project Leader (7 projects) or Senior Researcher (29 projects). He has co-authored more than 110 scientific articles, 41 of which in peer-reviewed journals and the citations to his work exceed 930.

Dr. Yannis Sarafidis (male) is a Senior Researcher at NOA. Dr. Sarafidis has worked in the field of energy planning, environmental and climate change impacts. He has participated in 29 research projects (of which in 3 as project leader) on the above-mentioned subjects. He has published more than 50 scientific articles, of which 24 in refereed journals (SCI h-factor: 13; Citations: 501). He was an Expert Reviewer of the IPCC 4th Assessment Report /Working Group III: Mitigation and he also participated as a Contributing Author in the IPCC 5th Assessment Report, Chapter II - Impacts, Adaptation & Vulnerability.

[ACTRIS PPP]

Dr. Elena Georgopoulou (female) is a Senior Researcher at NOA. She has over 20-years experience on issues related to the assessment of impacts of climate change on energy, agriculture, water resources and coastal areas. Lead Author in the IPCC 5th Assessment Report for examining climate change impacts in Europe, also acting as National Focal Point to the IPCC. She has participated in 30 research projects (of which in 8 as project leader) on the above-mentioned subjects. She has published more than 40 scientific articles, of which 32 in refereed journals (SCI h-factor: 16; Citations: 920).

Dr. K. Eleftheriadis (male), Research Director, has more than 66 publications in peer reviewed journals (780 citations, h-index 14) regarding atmospheric aerosol science, measurement methodology and applications. He is responsible for the DEM Research Aerosol Station of NCSR-D and he has participated in several national, European and international projects.

Prof. Dr. A. Papayiannis (male) has published more than 100 scientific papers in International Journals and has participated in more than 50 research projects in the EU or national level, he has more than 1960 scientific citations (h-index of 23). Dr. A. Papayannis has more than 25 years experience in the management and coordination of 30 research projects related to the lidar technique on national and European level.

Dr. S. Kazadzis (male) is a Senior Researcher at IERSD/NOA. His main interests include research on solar radiation measurements and effects, the physical and optical properties of aerosols, with expertise in ground based and satellite remote sensing techniques and methodologies. He has 83 publications in peer reviewed articles concentrating about 1380 citation (h-index 22), has participated and/or co-ordinated as PI in national and EU projects.

Dr. A. Bougiatioti (female) is a Research Associate at IERSD/NOA. Her research focuses on atmospheric chemistry and physics, with expertise in cloud condensation nuclei (CCN), aerosol chemical composition and size distribution. She knows how to operate state-of-the-art instrumentation and dealing with the respective data analysis. She has 25 publications in peer reviewed journals, with 844 citations (h-index 16), has received a national grant (NSRF 2007-2013) and participated in EU projects (ACTRIS, ACTRIS-2).

Dr. Eleni Athanasopoulou (female) is a Research Fellow at IERSD/NOA since 2011, conducting research on the impact of pollution extremes on air quality and radiation using atmospheric numerical models. She has received 2 grants (Ph.D. and post-doctoral) and participated in 15 research projects. She has 11 publications in peer-reviewed scientific journals and 24 publications in international scientific conferences.

Relevant publications

1 Gerasopoulos, E., Kazadzis, S., Vrekoussis, M., Kouvarakis, G., Liakakou, E., Kouremeti, N., Giannadaki, D., Kanakidou, M., Bohn, B., Mihalopoulos, N., Factors affecting O3 and NO2 photolysis frequencies measured in the eastern Mediterranean during the five-year period 2002-2006, **J. Geoph. Res.,** *Volume 117, Issue 22, Article number D22305, 2012.*

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5 Paraskevopoulou, D., Liakakou, E., Gerasopoulos, E., Mihalopoulos, N., Sources of atmospheric aerosol from long-term measurements (5years) of chemical composition in Athens, Greece, Science of the Total Environment, Volume 527-528, Pages 165-178, 2015.

Relevant projects

1 Development of Synergistic methodologies and tools for monitoring and forecasting environmental parameters (THESPIA, National Project 1MEU)

2 Global mapping of aerosol properties using neural network inversions of ground and satellite based data (EU project AEROMAP)

[ACTRIS PPP]

3 Lidar Climatology of Vertical Aerosol Structure for Space-Based Lidar Simulation Studies (ESA project, LIVAS)

4 ACTRIS (Aerosols, Clouds, and Trace gases Research Infrastructure Network)

5 ARISTOTELIS: Study of factors affecting the field of Solar Radiation in Greece - Demonstration and implementation of short and medium-term forecast of Solar Energy.

Significant infrastructures

The Finokalia station is run by the Environmental Chemical Processes Laboratory (ECPL) of the University of Crete. The Finokalia station is located in the SE Mediterranean (35 20N, 25 40E, 150m asl.) and it is a unique station in the area regarding the long record in O3, oxidants, aerosol chemical composition and precipitation chemistry. It is located far from any local source of pollution, facing the sea within a sector 270o to 90o and the air is representative of synoptic scale atmospheric composition. Finokalia is equipped with in-situ meteorological instrumentation as well as continuous measurements of gaseous (O3, CO, NOx, and NOy), particulate (optical properties, chemical composition, mass and mass size distribution) and wet deposition. Due to the frequent presence of dust events the site is ideal for studying the interaction of gaseous compounds with heterogeneous surfaces (like dust and sea-salt).

The Thissio station is situated at downtown Athens (37.97 N, 23.72 E) and stands on the top of "Nymphs" hill at an elevation of 105 m above a limited urbanization area overlooking the city centre. The surrounding area hosts mostly ancient/ historical sites making it a very touristic location. Thissio station is equipped with in-situ meteorological instrumentation as well as continuous measurements of gaseous (O3, CO, NOx, and NOy) and particulate (optical properties, mass and mass size distribution, aerosol chemical composition) measurements.The major sources of air pollution in the close vicinity are expected to be vehicular emissions and primary emissions related to the leisure activities in the area, while through dispersion and circulation the sampled aerosol originating from a multitude of different potential sources may be considered as representative for the whole Attiki basin.

4.1.10 Norsk Institutt for luftforskning (NILU)

NILU - Norwegian Institute for Air Research is an independent institute specializing in climate and air pollution research. NILU has about 180 employees and conducts approximately 250 projects every year for government, industry and national and international organizations. NILU has during the last few years been involved in more than 90 EU and ESA financed projects relevant to ACTRIS (e.g. ACTRIS-1, ACTRIS-2, InGOS, MACC2, ECLIPSE, GEOMON, EUCAARI, EUSAAR, ACCENT, EARLINET-ASOS, SCOUT-O3, MEGAPOLI), ESFRI initiatives (ICOS and SIOS) and ESA-CCIs. NILU has coordinated a number of them in addition to being present in the steering committees of several international programs (CLRTAP-EMEP, GAW). NILU serves as the EMEP Chemical Coordination Centre (EMEP-CCC). The EMEP program comprises more than 40 Parties and forms the basis for UNECE CLRTAP abatement policies, as well as for the EU policies on Air Quality. NILU is a member to the European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM). The institute is involved in developing INSPIRE guidelines, E-reporting and GEOMS (Generic Earth Observation Metadata Standard). NILU plays central roles in the WMO – GAW program, being represented in 3 of the Scientific Advisory Groups (on Aerosols, Reactive Gases and Total deposition) as well as hosting the World Data Centre for Aerosols (WMO-WDCA) and since 2016 also the World Data Centre for Reactive Gases (WDCRG). The database infrastructure serves as a Data Collection and Production Centre in the WMO Information System (WIS). NILU is responsible for the EBAS database infrastructure hosting observation data of atmospheric chemical composition and physical properties. NILU also hosts the Earth Observation Validation Data Centre (EVDC), a database developed and operated on contract by ESA. Furthermore, NILU operates state of the art in situ observation facilities. These includes the supersites Zeppelin at Svalbard, Birkenes in southern Norway, and Troll at Antarcitca. In addition, many less comprehensive sites on the Norwegian main land. Our portfolio includes nearly all relevant instrumentation, ranging from in situ manual methods to remote sensing.

Role in the project

NILU has developed and hosts the ACTRIS Data Centre, consisting of an overarching data portal and three thematic and specialized underlying databases for the data curation. Here, NILU hosts the one for surface in-situ observations (EBAS), while the two other are hosted by FMI and CNR respectively. NILU also operates three ACTRIS supersites; one in the Arctic: Zeppelin Observatory, one in southern part pf Norway; Birkenes Observatory, and one at Antarctica: Troll Observatory. NILU will participate in the ACTRIS PPP to support the planning and development of Central Facilities as well as the National Facilities. Specifically, efforts will be committed to WP4 (defining the concept of ACTRIS Central facilities, and the Data Centre in particular), WP5 (on ACTRIS National Facilities, and the labelling of ACTRIS data in particular), WP6 (ACTRIS Service Provision leading the task “Definition of access principles to data, products, and advanced digital tools“). NILU will also be involved in all other WPs with minor roles, except WP9.

Principal personnel involved

Dr. Cathrine Lund Myhre (female) is a senior scientist at NILU. She has a PhD in spectroscopy and about 17 years of experience in understanding of atmospheric compositional change, including data management and data quality requirements. Lund Myhre is author or co-author of more than 30 papers in peer reviewed literature (~ 2500 citations) more than 40 scientific reports including contributing author to IPCC 5thAR, WG I, Chapter 2 (Observations: Atmosphere and Surface). She is an experienced project leader (e.g. a number of Norwegian Research Council projects, the national monitoring of greenhouse gases, and also leading the ACTRIS Data Center in ACTRIS-1 and ACTRIS-2 amongst others).

Dr. Markus Fiebig (male) will also contribute to the ACTRIS PPP. He received his PhD in meteorology from the University of Munich, Germany in 2001. He is a senior researcher at NILU with background on direct and indirect atmospheric aerosol climate effects with ground- and aircraft based measurements of aerosol properties. Fiebig leads and manages the GAW World Data Centre for Aerosol, including the pilot project on near-real-time data dissemination. He has authored or co-authored 41 peer-reviewed publications (more than 1500 citations) and is and has been coordinating tasks and work packages in several international projects (ACTRIS-1, ACTRIS-2, EUSAAR, IAGOS).

Relevant publications

1 Tørseth, K., Aas, W., Breivik, K., Fjæraa, A. M., Fiebig, M., Hjellbrekke, A. G., Lund Myhre, C., Solberg, S., and Yttri, K. E.: Introduction to the European Monitoring and Evaluation Programme (EMEP) and observed atmospheric composition change during 1972–2009, Atmos. Chem. Phys., 12, 5447-5481, doi:10.5194/acp-12-5447-2012, 2012.

2 Myhre, C. Lund and Baltensperger U. (ed.) “Recommendations for a Composite Surface-Based Aerosol Network”, Contributing authors: Barrie, L., Fiebig, M., Goloub, P., Gras, J., Holzer-Popp, Y., Jennings, G., Kinne, S., Klausen, J., Laj, P., de Leeuw, G., Li, S.-M., Müller, D., Ogren, J., Pappalardo, G., Schulz, M., Smirnov, A., Volz-Thomas, A., Wehrli, C., Wilson, J., Xiao-Ye,Z., A GAW report 207, (2013).

3 Hartmann, D.L., A.M.G. Klein Tank, M. Rusticucci, L.V. Alexander, S. Brönnimann, Y. Charabi, F.J. Dentener, E.J. Dlugokencky, D.R. Easterling, A. Kaplan, B.J. Soden, P.W. Thorne, M. Wild and P.M. Zhai, 2013: Observations: Atmosphere and Surface. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

4 Petzold, A., J.A. Ogren, M. Fiebig, P. Laj, S.-M. Li, U. Baltensperger, T. Holzer-Popp, S. Kinne, G. Pappalardo, N. Sugimoto, C. Wehrli, A. Wiedensohler, and X.-Y. Zhang, 2013: Recommendations for reporting "black carbon" measurements, Atmos. Chem. Phys., 13, 8365 – 8376, doi: 10.5194/acp-13-8365-2013.

5 G. W. Mann, K. S. Carslaw, C. L. Reddington, K. J. Pringle, M. Schulz, A. Asmi, D. V. Spracklen, D. A. Ridley, M. T. Woodhouse, L. A. Lee, K. Zhang, S. J. Ghan, R. C. Easter, X. Liu, P. Stier, Y. H. Lee, P. J. Adams, H. Tost, J. Lelieveld, S. E. Bauer, K. Tsigaridis, T. P. C. van Noije, A. Strunk, E. Vignati, N. Bellouin, M. Dalvi, C. E. Johnson, T. Bergman, H. Kokkola, K. von Salzen, F. Yu, G. Luo, A. Petzold, J. Heintzenberg, A. Clarke, J. A. Ogren, J. Gras, U. Baltensperger, U. Kaminski, S. G. Jennings, C. D. O'Dowd, R. M. Harrison, D. C. S. Beddows, M. Kulmala, Y. Viisanen, V. Ulevicius, N. Mihalopoulos, V. Zdimal, M. Fiebig, H.-C. Hansson, E. Swietlicki, and J. S. Henzing, 2014: Intercomparison and evaluation of global aerosol microphysical properties among AeroCom models of a range of complexity, Atmos. Chem. Phys., 14, 4679 – 4713, doi:10.5194/acp-14-4679-2014

Relevant projects

1 ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network), EU FP7, 2011-2014, grant agreement number 262254; WP leader, responsible for ACTRIS data center.

2 ACTRIS-2 (Aerosols, Clouds, and Trace gases Research InfraStructure Network)(2015->), grant agreement number 654109; WP leader, responsible for the ACTRIS data center

3 EMEP-CCC (Chemical Coordinating Centre) of the European Monitoring and Evaluation Programme under the Convention on Long Range Transboundary Air Pollution (UN-ECE), contract and signed Memorandum of understanding between United Nations Economic Commission for Europe (UNECE) and NILU to coordinate and lead this.

4 ECLIPSE (Evaluating the Climate and Air Quality Impact of Short-Lived Pollutants); EU FP7, 2011 – 2014, grant agreement number 282688; coordinator

5 InGOS (Integrated non-CO2 greenhouse gas Observing System), EU FP7, Grant Agreement Number 284274, 2011 – 2014; hosting all halocarbon data

Significant infrastructures

NILUs main contribution is to provide a central facility represented by the EBAS database, and the ACTRIS data portal linking the topic data bases. EBAS is a database infrastructure operated by NILU. Its main objective is to handle, store and disseminate atmospheric composition data generated by international and national frameworks like long-term monitoring programmes and research projects. The database is tailored to host a wide range of atmospheric composition measurements from fixed sites or mobile platforms, but mainly used time for series from fixed locations. Data reporting standards established for more than 600 different chemical/physical variables. In operation since 1970ies, with basic funding secured through the EMEP protocol of the CLRTAP. Also used by a number of other national and international monitoring programs including WMO Global Atmosphere Watch (World Data Centre for Aerosols), Arctic Monitoring and Assessment Programme, OSPAR, HELCOM. The database has also been utilized by a large number of EU research projects. NILU has also developed the ACTRIS data portal, linking three thematically different underlying databases (one of these is EBAS). Further, NILU operates national facilities represented by the atmospheric supersites Birkenes (Southern Norway), Mt Zeppelin (Svalbard/Arctic) and Trollhaugen (Antarctica).

[ACTRIS PPP]

4.1.11 Universitat Politècnica de Catalunya (UPC)

The Technical University of Catalonia (Universitat Politècnica de Catalunya -Barcelonatech, UPC, Barcelona, Spain) is a public institution, one of the largest technical universities in Spain, devoted to higher education and research in the fields of architecture, science and engineering. The Remote Sensing Laboratory (RSLab) of the Department of Signal Theory and Communications addresses a wide range of research topics, including optical and microwave, active and passive remote sensing. In the Department of Engineering Design, the Earth Sciences research group has a renowned experience in atmospheric modelling, including air quality, emission inventories, meteorological and photochemical modelling, mineral dust and data assimilation, and owns observation instruments such as a micro-pulse lidar, a sun-photometer, and pyranometers

Within RSLAB, the lidar group holds 23 years of experience in lidar system design, operation, data inversion algorithms and exploitation of results. In particular it designed and built, and currently operates and exploits the lidar system of the Barcelona EARLINET station and complementary instrumentation relevant to atmospheric aerosol remote sensing. Moreover, its premises are close to those of the CSIC institute also participating in ACTIRS PPP, which generates local/regional synergies creating a supersite with the combined capabilities of both institutions.

UPC is a member of EARLINET since its inception and has participated in the FP5 EARLINET project (contract No. EVR1-CT-1999-40003), the FP6 EARLINET-ASOS (contract No. 025991 (RICA)), where it was responsible for the networking action 2 “Exchange of expertise”, the FP7 project ACTRIS (grant agreement No. 262254), where it led the Work Package 2 “Remote sensing of vertical aerosol distribution”, and it participates currently in H2020 ACTRIS-2 (grant agreement No. 654109), where it leads task 2.1 “Exchange of expertise” within the Work Package 2 “Profiling of aerosols and clouds”.

Role in the project

The JRU coordinated by UPC participates in all the ACTRIS-PPP work packages, except WP4, WP6 and WP9, with specific participation of UPC in WP1, WP5, WP7 and WP8. The involvement of the JRU linked third parties is detailed in section 4.2. In addition, since its establishment in 2013 through a Memorandum of Understanding, UPC coordinates ACTRIS-Spain, which is constituted by the JRU members, by beneficiary CSIC and by beneficiary UVA and its linked third party AEMET

Principal personnel involved

Dr. Adolfo Comerón (male) is a professor in the Department of Signal Theory and Communications of UPC. He coordinates ACTRIS-Spain and has been the UPC PI in the FP5 project EARLINET, in the FP6 project EARLINET-ASOS, and in the FP7 project ACTRIS; he is currently UPC PI in the H2020 project ACTRIS-2. He was elected as member of the International Coordination-group on Laser Atmospheric Studies working group for the term 2004-2010.

Dr. Carlos Peréz García-Pando (male) has been awarded an AXA Chair on Sand and Dust Storms based at the BSC. His research interests range from understanding the physical and chemical processes controlling atmospheric dust at multiple time scales, to evaluating its effects upon climate, ocean biogeochemistry, air quality and health. He has served as PI in multi-institutional research projects funded by NASA and in the European framework programme.

Dr. Begoña Artíñano (female) is a Senior Researcher at CIEMAT. She is head of the Atmospheric Pollution Characterization Unit at CIEMAT and has more than 30 year experience in atmospheric processes and aerosol properties characterization. Main responsible of the in-situ measurements of the Madrid ACTRIS station. IP of a number of national funded research projects and 3 projects in EU- Programmes FP5 and FP7.

Dr. Margarita Yela (female), is a Senior Scientist, PhD in Atmospheric Physics, and is heading the Atmospheric Research Branch at INTA. She has been working in the field of spectroscopic measurements of atmospheric trace gases since 1993. She was involved in the development of various ground-based MAXDOAS instruments and associated retrieval schemes and in the long-term monitoring at NDACC stations. She has participated in 38 National and European funded projects (13 FWP and 4 ESA) and contributed to more than 75 peer reviewed papers in her field of research.

Dr. Lucas Alados-Arboledas (male) is a Professor of Applied Physics and Principal Investigator of the Atmospheric Physics Group at the University of Granada. He has led different projects focused on the study of atmospheric aerosols and their role in the Earth energy balance using multiwavelength lidar with depolarization-measurement capabilities and sun/star/lunar radiometers, and near surface in-situ techniques. He has been PI of UGR in the FP7 project ACTRIS and is currently PI of UGR in the H2020 project ACTRIS-2.

[ACTRIS PPP]

Relevant publications

1. Granados-Muñoz, M. J., F. Navas-Guzmán, J. L. Guerrero-Rascado, J. A. Bravo-Aranda, I. Binietoglou, S. N. Pereira, S. Basart, J. M. Baldasano, L. Belegante, A. Chaikovsky, A. Comerón, G. D'Amico, O. Dubovik, L. Ilic, P. Kokkalis, C. Muñoz-Porcar, S. Nickovic, D. Nicolae, F. J. Olmo, A. Papayannis, G. Pappalardo, A. Rodríguez, K. Schepanski, M. Sicard, A. Vukovic, U. Wandinger, F. Dulac, and L. Alados-Arboledas (2016), Profiling of aerosol microphysical properties at several EARLINET/AERONET sites during July 2012 ChArMEx/EMEP campaign, Atmos. Phys. Chem. 16:11, pp. 7043-7066. doi: 10.5194/acp-16-7043-2016.
2. Sicard, M., G. D'Amico, A. Comerón, L. Mona, L. Alados-Arboledas, A. Amodeo, H. Baars, J. M. Baldasano, L. Belegante, I. Binietoglou, J. A. Bravo-Aranda, A. J. Fernández, P. Fréville, D. García-Vizcaíno, A. Giunta, M. J. Granados-Muñoz, J. L. Guerrero-Rascado, D. Hadjimitsis, A. Haefele, M. Hervo, M. Iarlori, P. Kokkalis, D. Lange, R. E. Mamouri, I. Mattis, F. Molero, N. Montoux, A. Muñoz, C. Muñoz Porcar, F. Navas-Guzmán, D. Nicolae, A. Nisantzi, N. Papagiannopoulos, A. Papayannis, S. Pereira, J. Preißler, M. Pujadas, V. Rizi, F. Rocadenbosch, K. Sellegri, V. Simeonov, G. Tsaknakis, F. Wagner, and G. Pappalardo (2015), EARLINET: potential operationality of a research network, Atmos. Meas. Tech., 8:11, pp. 4587-4613, doi:10.5194/amt-8-4587-2015.
3. Adame, J.A., C. Córdoba-Jabonero, C., M. Sorribas, D. Toledo, M. Gil-Ojeda, (2015), Atmospheric boundary layer and ozone-aerosols interactions under dusty conditions during a Saharan intrusion. Atmospheric Environment, 104, 205-216, doi:/10.1016/j.atmosenv.2014.12.036.
4. Gómez-Moreno F. J., E. Alonso, B. Artíñano, V. Juncal- Bello, S. Iglesias-Samitier, M. Piñeiro-Iglesias, P. López-Mahía, N. Pérez, J. Pey, A. Ripoll, A. Alastuey, B. A. de la Morena, M. I. García, S. Rodríguez, M. Sorribas, G. Titos, H. Lyamani, L. Alados-Arboledas, E. Latorre, T. Tritscher, and O. F. Bischof (2015), Intercomparisons of Mobility Size Spectrometers and Condensation Particle Counters in the Frame of the Spanish Atmospheric Observational Aerosol Network. Aerosol Science and Technology, 49:9, 777-785. doi: 10.1080/02786826.2015.1074656.
5. Pérez C., K. Haustein, Z. Janjic, O. Jorba, N. Huneeus, J. M. Baldasano, T. Black, S. Basart, S. Nickovic, R. L. Miller, J. P. Perlwitz, M. Schulz, M. Thomson (2011) Atmospheric dust modeling from meso to global scales with the online NMMB/BSC-Dust model–Part 1: Model description, annual simulations and evaluation. Atmos. Chem. Phys. 11:24, pp. 13001–13027, www.atmos-chem-phys.net/11/13001/2011/ doi:10.5194/acp-11-13001-2011.

Relevant projects

1. H2020 Project "Aerosols, Clouds, and Trace gases Research InfraStructure (ACTRIS-2)", Grant Agreement No. 654109. 1 May 2015 – 30 April 2019. PI: Gelsomina Pappalardo (CNR-IMAA, Potenza, Italy), Paolo Laj (Université Joseph Fourier Grenoble 1, France). JRU participants: all
2. 7th FP Project "Aerosol, Cloud, and Trace Gases Research Infrastructure Network (ACTRIS)", Grant Agreement nº 262254. 1 April 2011 – 31 March 2015. PI: Gelsomina Pappalardo (CNR-IMAA, Potenza, Italy), Paolo Laj (Université Joseph Fourier Grenoble 1, France). JRU participants: all
3. LIFE project "MonItoring and modelling NOx removal efficiency of photocatalytic materials: A STRategy for urban air quality managEmEnT (LIFE MINOx-STREET)". EU LIFE Programme reference (LIFE12 ENV/ES/000280). PI at CIEMAT: M. Palacios
4. 7th F Project "Demonstration Network Of ground-based Remote Sensing Observations in support of the Copernicus Atmospheric Service (NORS)". Grant Agreement No. n°284421. 1 January 2011-31 October 2014. PI: Martine de Mazière (IASB, Belgium). JRU participant: INTA
5. 7th FP Project "HEalth Risk from Environmental Pollution Levels in Urban Systems (HEREPLUS)", Grant Agreement No. 212854. 1 October 2008 - 30 September 2011. PI: S. Trueman (CSI, Italy). JRU participant: CIEMAT

Significant infrastructures

UPC is running a mutiwavelength lidar with elastic channels at 1064 nm, 532 nm, and 355 nm, N2 Raman channels at 607 nm and 387 nm, a water vapor Raman channel at 407 nm and depolarization measurement capability at 532 nm. The system belongs to EARLINET and operates at the UPC Campus Nord site in Barcelona (41.389 N, 2.112 E), in a urban residential and services area, close to urban thoroughfares, at the foot of a range of hills reaching

between 300 m and 500 m, near the end of the range yielding to the wide Llobregat river valley, and at 6 km of the Barcelona harbour area. Complementary remote sensing instruments at the same site include a micro-pulse lidar operating at 532 nm soon to be integrated into MPLNET, and a CIMEL sun–photometer CE-318-4 integrated into AERONET. Ancillary instrumentation includes pyranometers that are part SolRad-Net. Radiosondes are launched daily at 00:00 UTC and 12:00 UTC from a site 700 m away.

The other JRU members contribute with a wide range of remote sensing an in-situ observational infrastructures, as well as computational infrastructures, described in detail in section 4.2.

4.1.12 Agencia Estatal Consejo Superior de Investigaciones Cientificas (CSIC)

The Spanish National Research Council (CSIC, www.csic.es) is the largest public institution dedicated to research in Spain and the third largest in Europe, covering from basic research to advanced technological development. Its research is driven by its centres and institutes (more than 100), which are spread across all the autonomous regions, and its more than 15,000 staff, of whom more than 3,000 are staff researchers and the same number again are graduates and postgraduates. The Group of Investigation in Geochemistry of Aerosols (GIGA) belongs to the Institute of Environmental Assessment and Water Studies (IDÆA). This group is specialist in atmospheric aerosol monitoring, sampling, characterization and source apportionment. These activities provide scientific knowledge on which assessment of air pollutant effects on different aspects of the environment, from human health to climate, can be based. The team operates several ground based stations in urban (Barcelona), rural (Montseny) and remote (Montsec) areas. The research team provides external expert support to Spanish environmental authorities and participates in the workgroup on particulate matter of the Clean Air For Europe (CAFE) program of the DG Environment for the evaluation of the EU air quality directives.

Research on atmospheric pollution by IDAEA-CSIC is carried out in strong collaboration with other Spanish research organizations such as University of Huelva, Centro de Estudios Ambientales del Mediterráneao (CEAM), Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Instituto de Tecnología Cerámica-Universitat Jaume I (ITC-UJI) and Centro de Investigación Atmosférica de Izaña-Agencia Estatal de Meteorología (CIAI-AEMET). These organizations are official "Associated Units" to CSIC for research on atmospheric pollution.

Role in the project

CSIC will participate in WP1 (ACTRIS governance and management, Connecting national ACTRIS activities to ACTRIS PPP), WP5 (ACTRIS National Facilities, Technical concept and requirements for observational sites for exploratory platforms) and WP6 (ACTRIS Service Provision).

Principal personnel involved

Dr. Andrés Alastuey (male): is a Research Professor with more than 20 years of experience on environmental geochemistry, namely on atmospheric pollution. He is Deputy Director of IDAEA and Representative of CSIC in the foundation board of CEAM. He is Assessor of the Spanish Ministry of the Environment for PM and air quality. He has participated/coordinated around 70 research projects funded by the EU, other Spanish or international research bodies, the Ministry of the Environment and other private companies. He is supervisor/co-supervisor of 10 PhDs and co-author of around 300 papers in SCI journals. He is included in the Essential Science Indicators of the ISI Web of knowledge in the fields of Geosciences and Environment/Ecology (total number of quotations is >10000). Hirsch index = 60. Research ID: E-1706-2014.

Dr. Xavier Querol (male): he is a Research Professor with more than 25 years in environmental geochemistry and air quality. He is devoting his research activity on the study of the aerosol constituents in urban, rural and remote atmospheres for quantification of the major source contributions and for elucidation of the transformation processes occurring under different climate conditions. He was in the working groups of the EC in preparing and drafting of the new directives of European air quality. He has participated in working groups and scientific advisory committees of the UN (UNECE and IPPC), WHO (REVIHAAP, HRAPIE), DGMACE (Clean Air for Europe, Expert Group of Stakeholders reviewing European Air Quality Policy). Since 2011, he is Vice-chairman of the United Nations Scientific Committee-CLTRAP EMEP (European Monitoring and Evaluation Program, Convention on Long-range Transboundary Air Pollution UNECE). He is advisor of the Spanish Ministry of Environment and Autonomous councils for Air Quality management. So far, he has published more than 460 papers in journals included in the SCI. He is supervisor/co-supervisor of more than 20 PhDs. He is included in the Essential Science Indicators of the ISI Web of knowledge in the fields of Environment/Ecology and geosciences. For all fields the number of quotations is 1727. Hirsch index = 64. Research ID: E-2800-2014

Relevant publications

Papers included are result of large co-operation projects; that implies high number of co-authors

1. Alastuey, A., Querol, X., Aas, W., Lucarelli, F., Pérez, N., Moreno, T., Cavalli, F., Areskoug, H., Balan, V., Catrambone, M., Ceburnis, D., Cerro, J. C., Conil, S., Gevorgyan, L., Hueglin, C., Imre, K., Jaffrezo, J.-L., Leeson, S. R., Mihalopoulos, N., Mitosinkova, M., O'Dowd, C. D., Pey, J., Putaud, J.-P., Riffault, V., Ripoll, A., Sciare, J., Sellegri, K., Spindler, G. and Yttri, K. E.: Geochemistry of PM10 over Europe during the EMEP intensive measurement periods in summer 2012 and winter 2013, Atmos. Chem. Phys., 16(10), 6107–6129, doi:doi:10.5194/acp-16-6107-2016, 2016.

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2. Pandolfi, M., X. Querol, A. Alastuey, J. L. Jimenez, O. Jorba, D. Day, A. Ortega, M. J. Cubison, A. Comerón, M. Sicard, C. Mohr, A. S. H. Prévôt, M. C. Minguillón, J. Pey, J. M. Baldasano, J. F. Burkhart, R. Seco, J. Peñuelas, B. L. van Drooge, B. Artiñano, C. Di Marco, E. Nemitz, S. Schallhart, A. Metzger, A. Hansel, J. Lorente, S. Ng, J. Jayne, and S. Szidat. Title: Effects of sources and meteorology on particulate matter in the Western Mediterranean Basin: An overview of the DAURE campaign (2014). , J. Geophys. Res. Atmos., Vol. 119, 4978-5010. doi:10.1002/2013JD021079, 2014.

3. Dall'Osto M., Querol X., Alastuey A., Minguillon M. C., Alier M., Amato F., Brines M., Cusak M., Grimalt J. O., Karanasiou A., Moreno T., Pandolfi M., Pey J., Reche C., A. Ripoll, R. Tauler, B. L. Van Drooge, M. viana, R. M. Harrison, J. Gietl, D. Beddows, W. Bloss, C. O'dowd, D. Ceburnis, G. Martucci, S. Ng, d. Worsnop, J. Wenger, E. Mc Gillcuddy, J. Sudou, R. Healy, F. Lucarelli, S. Nava, J. L. Jimenez, F. Gomez Moreno, B. Artinano, A. S. H. Prevot, L. Pfaffenberger, S. Frey, F. Wilsenack, D. Casabona, P. Jiménez-Guerrero, D. Gross, and N. Cots. Presenting SAPUSS: solving aerosol problem by using synergistic strategies at Barcelona, Spain. Atmos. Chem. Phys., 13, 8991–9019, 2013 www.atmos-chem-phys.net/13/8991/2013/ doi:10.5194/acp-13-8991-2013.

4. Minguillón M.C. , N. Perron, X. Querol, S. Szidat, S.M. Fahrni, A. Alastuey, J.L. Jimenez, C. Mohr, A.M. Ortega,, D.A. Day, V.A. Lanz, L. Wacker, C. Reche, M. Cusack, F. Amato, G. Kiss, A. Hoffer, S. Decesari, F. Moretti, R. Hillamo, K. Teinilä, R. Seco, J. Peñuelas, A. Metzger, S. Schallhart, M. Müller, A. Hansel, J.F. Burkhart, U. Baltensperger, A.S.H. Prévôt. On Fossil versus contemporary sources of fine elemental and organic carbonaceous particulate matter during the DAURE campaign in Northeast Spain. Atmos. Chem. Phys., 11, 12067-12084, 2011.

5. Karanasiou, A., Querol, X., Alastuey, A., Perez, N., Pey, J., Perrino, C., Berti, G., Gandini, M., Poluzzi, V., Ferrari, S., de la Rosa, J., Pascal, M., Samoli, E., Kelessis, A., Sunyer, J., Alessandrini, E., Stafoggia, M., Forastiere, F., Alessandrini, E., Angelini, P., Berti, G., Bisanti, L., Cadum, E., Catrambone, M., Chiusolo, M., Davoli, M., de'Donato, F., Demaria, M., Gandini, M., Grosa, M., Faustini, A., Ferrari, S., Forastiere, F., Pandolfi, P., Pelosini, R., Perrino, C., Pietrodangelo, A., Pizzi, L., Poluzzi, V., Priod, G., Randi, G., Ranzi, A., Rowinski, M., Scarinzi, C., Stafoggia, M., Stivanello, E., Zauli-Sajani, S., Dimakopoulou, K., Elefteriadis, K., Katsouyanni, K., Kelessis, A., Maggos, T., Michalopoulos, N., Pateraki, S., Petrakakis, M., Rodopoulou, S., Samoli, E., Sypsa, V., Alguacil, J., Artiñano, B., Barrera-Gómez, J., Basagaña, X., de la Rosa, J., Diaz, J., Jacquemin, B., Karanasiou, A., Linares, C., Ostro, B., Perez, N., Pey, J., Querol, X., Sunyer, J., Tobias, A., Bidondo, M., Declercq, C., Le Tertre, A., Lozano, P., Medina, S., Pascal, L., Pascal., M. Title: Particulate matter and gaseous pollutants in the Mediterranean Basin: Results from the Med-Particles project. (2014) Science of the Total Environment, vol488-489C, 297-315 DOI information: 10.1016/j.scitotenv.2014.04.096

Relevant projects

1. AirMonTech—Air Quality Monitoring Technologies for Urban Areas. Project number 265116. Funding scheme Coordination and support action, FP7-ENV-2010. 1st December 2010 - 1st June 2013. 997,552.16 Euros. Coordinator: Dr. Thomas Kuhlbusch Institute of Energy and Environmental Technology – IUTA, Germany; CSIC PI: Mar Viana (IDAEA-CSIC)
2. ACTRIS Aerosols, Clouds, and Trace gases Research Infrastructure Network. Propuesta: 262254. FP7-INFRASTRUCTURES-2010-1. Funding scheme Combination of CP & CSA. 01/04/2011 -31/03/2015. 7.8 M Euros. Coordinator: Gelsomina Papalardo Consiglio Nazionale delle Ricerche (CNR); CSIC PI: Andrés Alastuey (IDAEA-CSIC)
3. BREATHE (BRain dEvelopment and Air polluTion ultrafine particles in scHool ChildrEn). Advanced Grand ERC FP7. 2011 – 2015. 2.5 M Euros. PI: Dr. Jordi Sunyer, (CREAL); CSIC IP: Xavier Querol (IDAEA-CSIC)
4. AIRUSE LIFE+. Testing and Development of air quality mitigation measures in Southern Europe. LIFE11 ENV/ES/000584. 2012- 2016. 2.368.719 Euros. PI: Xavier Querol (IDAEA-CSIC)
5. ACTRIS2 Aerosols, Clouds, and Trace gases Research Infrastructure. European Commission. Research and Innovation action (RIA). Coontract 654109. Coordinator: Gelsomina Papalardo Consiglio Nazionale delle Ricerche (CNR). 01/04/2015 hasta 31/03/2019. CSIC PI: Andrés Alastuey (IDAEA-CSIC)

Significant infrastructures

The IDAEA-CSIC group operates a network of monitoring stations for long term and intensive measurements of atmospheric aerosols, gases and meteorology. The network is operated in collaboration with the Autonomous Govern of Catalonia, and is part of the network for atmospheric pollution monitoring and prediction, from the Environment Department (Direcció General de Qualitat Ambiental (DGQA). The design of this network aims to

provide a picture on atmospheric composition in different environments which can be considered representative of the Western Mediterranean Basin, and to connect Air Quality and Climate Research. Measurements obtained at these environments allow investigating sources and processes of atmospheric pollutants and providing insight in order to define adequate strategies for air quality and climate policies.

This network integrates 3 sites: Montseny (MSY, 720 masl) regional background site, Montsec (MSA, 1590 m asl) remote background site, and a complementary urban background site in Barcelona (BCN). It is a well-equipped infrastructure for in-situ characterization of aerosols (optical, physical, and chemical offline and online -ACSM) and trace gases (NOx, SO2, O3, CO). These in situ measurements are complemented by columnar (CIMEL sun photometers) at MSA and BCN, operated by UB and UPC, and profile measurements (LIDAR, and Ceilometer) carried out by UPC and CSIC at BCN and MSA.

Infrastructure in MSY consists of two buildings offering accommodation to users and allow international meetings and courses.

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4.1.13 Universidad de Valladolid (UVA)

The University of Valladolid was founded in the XIII century and is one of the oldest universities in Europe. It comprises 25 faculties with 30.000 students and 2.000 teachers and researchers in all fields. The Group of Atmospheric Optics (GOA) belongs to the Optics Department of the Science Faculty, and has a long record in atmospheric research by optical methods for more than 20 years (http://goa.uva.es). Since 2006 the GOA group operates an AERONET calibration facility, in close collaboration with AERONET headquarters in NASA, the Laboratory of Atmospheric Optics in Lille and the Izaña Atmospheric Research Center, in Tenerife, belonging to the Meteorological State Agency of Spain (AEMET). This calibration facility has participated in the ACTRIS and ACTRIS-2 projects.

The GOA-UVA and the Izaña Observatory-AEMET form a Joint Research Unit, with extensive collaboration in the fields of solar radiation and column aerosol properties, with the umbrella of 2 official agreements (2007-2010 and 2010-2014) that have supported the AERONET calibrations, 2 PhD theses and a number of joint publications.

Role in the project

The GOA expertise in sun photometer measurements, calibration and quality assurance will play a key role in the AERONET-Europe calibration center (WP4), devoted to the calibration of sun photometers, data quality assurance, data provision, instrument testing and training. The operation of the GOA calibration facility since 2006 as well as the successful results in ACTRIS-1 and the ongoing ACTRIS-2 projects, make it reliable that UVA can host the Spanish node of the AERONET-Europe Central Facility. Furthermore, Izaña observatory, acting as third party of UVA, will provide calibration of master Sun photometers and keep traceability of those absolute calibrations. Furthermore, the UVA office for European projects at FUNGE (see third party description below) and law departments at UVA and AEMET will contribute to the ACTRIS Governance and management (WP1), Financial Framework (WP3), ACTRIS Service Provision (WP6) work packages.

Principal personnel involved

Dr. Carlos Toledano (male), principal investigator for ACTRIS-PPP at UVA. He is currently principal investigator of ACTRIS-2 at UVA, graduated in Physics at Complutense University in Madrid (1999) and received his PhD at University of Valladolid in 2005. For 2 years he was postdoctoral fellow at the Meteorological Institute, University of Munich (Germany). He is researcher at University of Valladolid since 2008. His research is focused on the investigation of the atmospheric components, mainly aerosol, by optical methods, regarding aerosol characterization, data quality assurance and field campaigns. He has more than 50 peer-reviewed publications in SCI journals and received the 3M Foundation Award 2008 for Environmental Science. Currently he is in charge of the operations, calibration and quality assurance of the GOA calibration facility that is part of AERONET, and participates in the European infrastructure project ACTRIS.

Prof. Dr. Victoria Cachorro (female), is the scientific director of the Group of Atmospheric Optics (GOA). She graduated in Physics at Valladolid University in 1978 and received her Phd at University of Valladolid in 1985. She is University Professor since 2002. Her research experience includes both experimental work and modelling of spectral solar radiation and its application to atmospheric aerosol research by remote sensing techniques. She is leader of the Iberian Network for Aerosol Measurements (RIMA), federated to AERONET and the GOA calibration facility. She has supervised 12 PhD theses and has more than 100 peer-reviewed publications, and has been principal investigator in more than 20 national and European projects. She was member of the Internacional Radiation Comission (IAMAS) in 2009-2012.

Relevant publications

1. Barreto, Á., Cuevas, E., Granados-Muñoz, M.-J., Alados-Arboledas, L., Romero, P. M., Gröbner, J., Kouremeti, N., Almansa, A. F., Stone, T., Toledano, C., Román, R., Sorokin, M., Holben, B., Canini, M., and Yela, M.: The new sun-sky-lunar Cimel CE318-T multiband photometer – a comprehensive performance evaluation, Atmos. Meas. Tech., 9, 631-654, doi:10.5194/amt-9-631-2016, 2016.
2. B. Torres, O. Dubovik, C. Toledano, A. Berjon, V. E. Cachorro, T. Lapyonok, P. Litvinov, P. Goloub, Sensitivity of aerosol retrieval to geometrical configuration of ground-based sun/sky radiometer observations. Atmospheric Chemistry and Physics, 14, 847-875, (2014)
3. B. Torres, C. Toledano, A. Berjón, D. Fuertes, V. Molina, R. Gonzalez, M. Canini, V. E. Cachorro, P. Goloub, T. Podvin, L. Blarel, O. Dubovik, Y. Bennouna, A. M. de Frutos, Measurements on pointing error and field of view of Cimel-318 Sun photometers in the scope of AERONET. Atmospheric Measurement Techniques, 6, 2207–2220, (2013)

4. García, R.D., O.E, García, E. Cuevas, V.E. Cachorro, P.M. Romero-Campos, R. Ramos and A.M. de Frutos, Solar radiation measurements compared to simulations at the BSRN Izaña station. Mineral dust radiative forcing and efficiency study, JGR-Atmospheres, Vol 119, 1-16, DOI: 10.1002/2013JD020301, 2014
5. Guirado, C., Cuevas, E., Cachorro, V. E., Toledano, C., Alonso-Pérez, S., Bustos, J. J., Basart, S., Romero, P. M., Camino, C., Mimouni, M., Zeudmi, L., Goloub, P., Baldasano, J. M., and de Frutos, A. M.: Aerosol characterization at the Saharan AERONET site Tamanrasset, Atmos. Chem. Phys., 14, 11753-11773, doi:10.5194/acp-14-11753-2014, 2014.

Relevant projects

1. ACTRIS-2 Aerosols, Clouds, and Trace gases Research Infrastructure Network, 2015-2019
2. ACTRIS Aerosols, Clouds, and Trace gases Research Infrastructure Network, 2011-2015
3. Specific collaboration agreement between the Spanish Meterological Agency and the University of Valladolid regarding the radiometry, ozone and aerosol programs carried out at Izaña Atmospheric Research Center, as well as the adaptation and integration of AEMET Cimel network within AERONET, 2011-2014
4. DATEC-RIMA development, technical and scientific application in the RIMA-AERONET network, 2012-2014
5. Specific collaboration agreement between the Spanish Meterological Agency and the University of Valladolid regarding the radiometry, ozone and aerosol programs carried out at Izaña Atmospheric Research Center, in the framework of the Global Atmosphere Watch program of the World Meteorological Organization, 2007-2010

Significant infrastructures

UVA provides the GOA calibration facility, which is an infrastructure for radiometric calibrations. This facility operates since 2004 and is in charge of AERONET calibrations since 2006. It basically consists of an observation platform for radiation measurements (Sun, sky, Moon), as well as a laboratory for radiometric calibrations that includes integrating spheres, calibrated lamps, etc. Both are located at Valladolid, Spain. Other radiometric observations, ceilometer and all-sky camera are also collocated with the AERONET Sun photometers.

4.1.14 University of Manchester (UMAN)

The University of Manchester is a British Higher Education institution. Its mission is to conduct research and educate students. The Centre for Atmospheric Science at Manchester studies processes important to climate change and air quality in the troposphere and lower stratosphere – the lowest 20 km of the Earth's atmosphere. We are one of the largest such groups in UK universities, and have extensive collaborative links with leading atmospheric sciences groups world-wide. We have a strong experimental programme, with a range of state-of-the-art facilities for field and laboratory measurements. To complement the measurements we run numerical models on a variety of scales using code developed at Manchester as well as national and international standard models. The Centre for Atmospheric Science also hosts staff from the National Centre for Atmospheric Science (NCAS) and collaborates with NCAS in the delivery of its science programme.

Role in the project

UMAN's role is to coordinate the UK's contribution to ACTRIS PPP and to contribute to WPs 1-3 and 7 of the project. The University is undertaking this role because of its role in the National Centre for Atmospheric Sciences, NCAS, which is not itself a legal entity.

Principal personnel involved

Professor Geraint Vaughan (male) is Director of Observations for the National Centre for Atmospheric Science. He has 40 years experience in atmospheric research and has conducted research with ground-based lidars since 1984. In addition, he has coordinated research programmes in atmospheric dynamics and composition, most notably in the framework of TWP-ICE in Australia in 2005-6 and the UK Storm Risk Mitigation programme in 2010-13. He recently participated in the ATTREX/CONTRAST/CAST project to study the tropical tropopause layer in 2014 (using ozonesondes and ground-based composition measurements), and will participate in the forthcoming NAWDEX experiment in September-October 2016 (using ground-based lidars and wind profilers).

Professor Hugh Coe (male) is Professor of Atmospheric Composition. He has 25 years' experience in atmospheric research. He has led numerous ground and aircraft experimental studies and participated in EUCAARI as one of the coordinators of the airborne campaign.

Professor Gordon Mcfiggans (male) is Professor of Atmospheric Multiphase Processes with 20 years' experience in atmospheric science, with interests in field, laboratory and modelling studies. In addition to leading 3 National multidisciplinary consortia, he was University of Manchester PI in EU FP6 and FP7 consortia, WP leader in the MAP Strategic Research Project and EUCAARI Integrated Project, in the access to laboratory data steering group in the ACCENT Network of Excellence and the management group of the EUROCHAMP Network of Atmospheric Simulation Chambers, running the Manchester Aerosol Chamber and leading the aerosol modelling WP. He is leader of the modelling WP in the EUROCHAMP 2020 proposal. He was PI in 4 TNA activities in EUSAAR / ACTRIS.

Relevant publications

1. Kulmala, M. et al (including G. McFiggans and H. Coe), European integrated project on Aerosol, Cloud, Climate and Air Quality interactions (EUCAARI), Atmos. Chem. Phys., 11, 13061-13143, 2011.
2. Paramonov, M. et al (inc. G. McFiggans). A synthesis of cloud concentration nuclei counters (CCNC) measurements within the EUCAARI network, Atmos. Chem. Phys. 15, 12211-12229, 2015.
3. Reddington, C.L., McMeeking, G., Mann, G.W., Coe, H., Frontoso, M.G., Liu, D., Flynn, M., Spracklen, D.V., Carslaw, K.S. The mass and number size distributions of black carbon aerosol over Europe (2013) Atmospheric Chemistry and Physics, 13 (9), pp. 4917-4939.
4. Hamburger, T., McMeeking, G., Minikin, A., Petzold, A., Coe, H., Krejci, R. Airborne observations of aerosol microphysical properties and particle ageing processes in the troposphere above Europe (2012) Atmospheric Chemistry and Physics, 12 (23), pp. 11533-11554.
5. Aan De Brugh, J.M.J., Henzing, J.S., Schaap, M., Morgan, W.T., Van Heerwaarden, C.C., Weijers, E.P., Coe, H., Krol, M.C. Modelling the partitioning of ammonium nitrate in the convective boundary layer (2012) Atmospheric Chemistry and Physics, 12 (6), pp. 3005-3023.

Relevant projects

1. EUCAARI, GOCE 036833, 1/107-31/12/10
2. MAP, GOCE 018332,15/9/05 – 14/9/07

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3. EUROCHAMP-2, CP- CSA-INFRA-2008-2.2.01, 1/5/09-30/4/13

Significant infrastructures

UMAN hosts two mobile facilities (http://www.cas.manchester.ac.uk/restools/labs/mobile/); one a fully equipped container laboratory, the other a more mobile instrument trailer. The former has been deployed at ground-based stations across the UK and globally (Ireland, Borneo, Korea) as well as on-board a number of cruises on UK, German, Irish and Norwegian research vessels, taking measurements of aerosol microphysical, water uptake and optical properties and composition using state-of-the-science online instrumentation.
UMAN also hosts two medium scale infrastructures – the Manchester Aerosol Chamber (MAC, http://www.cas.manchester.ac.uk/restools/aerosolchamber/), a facility focussing on investigations of the photochemical transformations of secondary aerosol precursors and of real emissions from plants and engines and the Manchester Ice Cloud Chamber (MICC, http://www.cas.manchester.ac.uk/restools/cloudchamber/) which focuses on the investigation of warm, mixed phase and cold clouds. Both are included as infrastructures within the EUROCHAMP 2020 proposal.

4.1.15 National Environmental Research Council (NERC)

The Natural Environment Research Council (NERC)'s purpose is to promote and support high-quality basic, strategic and applied research, survey, long-term environmental observation and monitoring in environmental and related sciences to advance knowledge and technology. NERC's Centre for Ecology and Hydrology at Edinburgh leads the Biosphere-Atmosphere Interactions (BAI) Science Area. CEH is the UK's Centre of Excellence for integrated research in terrestrial and freshwater ecosystems and their interaction with the atmosphere. We provide National Capability based on innovative, independent and interdisciplinary science and long-term environmental monitoring, forming an integral part of NERC's vision and strategy. NERC undertake world-class research to underpin evidence-based decisions and innovation by policy-makers and businesses, and engages with people, supporting sustainable development and improving society's environmental legacy. BAI scientists specialize both concentration and flux measurements of trace atmospheric gases and aerosols. In Atmopsheric Composition group both for research and long-term monitoring is undertaken, operating the Auchencorth Moss WMO-GAW and EMEP level II/II atmospheric observatory. The Reactive Gases and Aerosol groups are leaders in trace gas and aerosol flux measurements from remote to urban environments.

Role in the project

NERC will participate in WP5 and represent the UK national facilities including the sites at Chilbolton and Auchencorth Moss and the Eurochamp chamber facilities. NERC will work in the ACTRIS PPP to ensure the flow of information between the ACTRIS and UK research organisations. NERC will also contribute to WP6 and the UK input into the access principles and cost for ACTRIS services.

Principal personnel involved

Dr Christine Braban (female), h-index: 13, publications: 35. Dr Braban is an environmental scientist who leads the Atmospheric Composition group in the Biosphere-Atmosphere Interactions science area at NERC CEH in Edinburgh. Dr Braban is an experienced project manager and coordinates the UK Eutrophying and Acidifying Atmospheric Pollutants monitoring project for the UK Department of Environment Farming and Rural affairs (Defra) and contributes to both the ACTRIS II project (sa NERC PI) and to the EMEP Task Force for Measurements and Modelling. She has a background in laboratory and field measurements relevant to atmospheric chemistry, recently with a focus on atmospheric ammonia and reactive oxidized nitrogen. Dr Braban is PI of the NERC contribution to a new EMRP ammonia metrology research project starting in September 2014 (EMRP project ENV55). Dr Braban has experience of aerosol flow tube kinetics and trace gas detection methodologies. Dr Braban was involved in both the field measurements and modelling components of the NitroEurope project and the Defra funded Agroforestry systems for ammonia abatement.

Dr Eiko Nemitz (male), h-index: 33; publications: 131. Dr Nemitz is an Environmental Physicist, leading the Reactive gases and Aerosol Group in the Biosphere-Atmosphere Interactions science area at NERC CEH in Edinburgh. His work encompasses the measurement of surface / atmosphere exchange fluxes of a wide range of trace gases and aerosols, using micrometeorological flux measurement approaches

Relevant publications

1. Colette, A. Aas, W., Banin, L. Braban, C.F. et al. 2016, Air pollution trends in the EMEP region between 1990 and 2012 Joint Report of EMEP Task Force on Measurements and Modelling (TFMM), Chemical Co-ordinating Centre (CCC), Meteorological Synthesizing Centre-East (MSC-E), Meteorological Synthesizing Centre-West (MSC-W). http://www.unece.org/fileadmin/DAM/env/lrtap/ExecutiveBody/35th_session/cccr1-2016_FINAL.pdf
2. Fowler, D.; Steadman, C.E.; Stevenson, D.; Coyle, M.; Rees, R.M.; Skiba, U.M.; Sutton, M.A.; Cape, J.N.; Dore, A.J.; Vieno, M.; Simpson, D.; Zaehle, S.; Stocker, B.D.; Rinaldi, M.; Facchini, M.C.; Flechard, C.R.; Nemitz, E.; Twigg, M.; Erisman, J.W.; Butterbach-Bahl, K.; Galloway, J.N.. 2015 Effects of global change during the 21st century on the nitrogen cycle [in special issue: Atmospheric composition change: science for policy] *Atmospheric Chemistry and Physics*, 15 (24). 13849-13893. 10.5194/acp-15-13849-2015
3. Malley, Christopher S.; Braban, Christine F.; Heal, Mathew R.. 2014 The application of hierarchical cluster analysis and non-negative matrix factorization to European atmospheric monitoring site classification. *Atmospheric Research*, 138. 30-40. 10.1016/j.atmosres.2013.10.019
4. O. Peltola, A. Hensen, C. Helfter, L. Belelli Marchesini, F. C. Bosveld, W. C. M. van den Bulk, J. A. Elbers, S. Haapanala, J. Holst, T. Laurila, A. Lindroth, E. Nemitz, T. Röckmann, A. T. Vermeulen, and I. Mammarella; Evaluating the performance of commonly used gas analysers for methane eddy covariance flux measurements: the InGOS inter-comparison field experiment, Biogeosciences Discuss., 11, 797-852, doi:10.5194/bgd-11-797-2014, 2014

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5. von Schneidemesser, Erika; Monks, Paul S.; Allan, James D.; Bruhwiler, Lori; Forster, Piers; Fowler, David; Lauer, Axel; Morgan, William T.; Paasonen, Pauli; Righi, Mattia; Sindelarova, Katerina; Sutton, Mark A.. 2015 Chemistry and the linkages between air quality and climate change [in special issue: 2015 chemistry in climate] *Chemical Reviews*, 115 (10). 3856-3897. 10.1021/acs.chemrev.5b00089

Relevant projects

1. H2020-TWINN-2015, NitroPortugal - Strengthening Portuguese research and innovation capacities in the field of excess reactive nitrogen, 2016 -2019
2. H2020-INFRAIA-2014-2015, ACTRIS-2 - Aerosols, Clouds, and Trace gases Research InfraStructure, 2015 – 2019
3. EU FP7 ENVIRONMENT 2011-2015 The Pan-European Gas-Aerosols Climate Interaction Study (PEGASOS) Eiko Nemitz *Co-I - with Prof Spyros Pandis, Univ. Patra, Greece*
4. FP7 –ENVIRONMENT ECLAIRE Effects of Climate Change on Air Pollution and Response Strategies for European Ecosystems
5. FP7-INFRASTRUCTURES-2010-1, ACTRIS - Aerosols, Clouds, and Trace gases Research Infrastructure Network, 2011-2015

Significant infrastructures

Together with its national partners and collaborating research institutes NERC supports two ACTRIS and EMEP ground-based observation sites, Auchencorth Moss and Chilbolton. Auchencorth Moss operates as a Level II/II EMEP site with all UK air quality networks at the site. It is a site within both trace gas and aerosol measurements. It is also a site within ICOS and undertakes continuous flux measurements include NO, NO_2, O_3, CH_4, SO_2 and NH3 using automated systems. There is also detailed characterisation of (micro-) meteorological parameters (including turbulence, heat fluxes, radiation, temperature, humidity). Chilbolton Observatory became the UK's second EMEP Level II site in 2016 and other research at Chilbolton is focussed on remote sensing including dynamical meteorology, cloud physics, satellite transmission measurements and radio wave propagation. Chilbolton is part of the ACTRIS network activity for profiling of aerosol and clouds. Other UK observatories include the urban supersite at North Kensington and Marylebone Road and the coastal Weyborne Observatory. The UK EUROCHAMP network there are four simulation chambers with Universities of Manchester (Manchester Aerosol Chamber), Leeds (Highly Instrumented Reactor for Atmospheric Chemistry, HIRAC), East Anglia (Sea-Ice chamber) and York.

4.1.16 Science and Technology Facilities Council (STFC)

The Science and Technology Facilities Council (STFC) is one of the UK's seven publicly funded Research Councils. It is primarily responsible for supporting, coordinating and promoting research, innovation and skills development in the areas of Astronomy, Nuclear & Particle Physics, Particle Astrophysics and Scientific Computing. It also works closely with other Research Councils, including the Natural Environment Research Council (NERC), for which it provides facilities (including those at Chilbolton) to the environmental science community. As well as its role in providing and developing large-scale national science facilities, STFC also manages subscriptions to large international collaborations on behalf of the UK government.

The STFC site at Chilbolton Observatory is operated RAL Space, a department of the STFC Rutherford Appleton Laboratory. It supports the research community in the Universities, government, and in other Research Councils by providing access to a portfolio of instruments including radars, lidars, radiometers, beacon receivers, and a wide variety of in-situ meteorological sensors. Chilbolton staff operate instruments to acquire detailed data on particular weather events of interest, as well as long-term measurements to provide climatological data.

Role in the project

STFC will participate in WP4, with a particular focus on the CF for Radar Calibration. The infrastructure at Chilbolton is proposed as a node of this facility. It will also contribute to WP6 on defining ACTRIS Service provision.

Principal personnel involved

Dr. Christopher Walden (male) is Head of the Chilbolton Facility for Atmospheric and Radio Research (CFARR), and has management responsibility for coordinating CFARR's work with the scientific requirements of researchers at the national level. He is active in national committees on atmospheric research using radar and on hydrological applications of radar. His background is in mathematical modelling of the melting-layer and its effects on radio wave propagation. He has worked extensively with data-sets from microwave and millimetre-wave propagation experiments (both terrestrial and earth-space), and has expertise in the interpretation of polarimetric Doppler radar measurements to diagnose propagation effects. He is responsible for radar calibrations and data quality assurance for Chilbolton's 3-, 35- and 94-GHz radars. He is involved in the development of standardized cloud radar calibration procedures within ACTRIS-2, and has responsibility for the ACTRIS/Cloudnet site at Chilbolton

Relevant publications

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Relevant projects

ACTRIS-2 (Grant Agreement No. 654109), 2015-2019.

Significant infrastructures

The Chilbolton Observatory is home to a wide range of scientific infrastructure to enable research in atmospheric science, radio communications, astronomy and space science and technology. These include LOFAR-UK, part of the Europe-wide Low Frequency Array radio telescope, and the Space Monitoring Facility for tracking and characterisation of orbiting satellites, together with satellite ground-station operations. The main activities at the

Observatory support the Chilbolton Facility for Atmospheric and Radio Research (CFARR), which STFC operates on behalf of NERC. For over 30 years, Chilbolton has supported an experimental programme in radio science, radio-wave propagation, atmospheric science and meteorology.

The radars at Chilbolton include the 3-GHz system on the 25-m diameter dish antenna, which is capable of high-resolution (spatial and temporal) Doppler and polarimetric measurements of rain and clouds. The ability to calibrate this instrument accurately using the polarimetric techniques makes it a reference instrument against which cloud radar calibrations may be compared. In addition, zenith-pointing polarimetric, Doppler 35-GHz and 94-GHz cloud radars are routinely operated for detailed microphysical studies of cloud processes and cloud climatology. A new, transportable, scanning 35-GHz cloud radar system is also now hosted at Chilbolton, further enhancing the available capability. The combination of the 3-, 35- and 94-GHz radars with polarimetric and Doppler capabilities, combined with other co-located instrumentation makes Chilbolton an ideal site for the provision of cloud radar calibration services as part of a Central Facility.

An ACTRIS/Cloudnet station has been in operation at Chilbolton for more than 10 years, exploiting the 35- and 94-GHz radars on site. The co-location of this with the calibration facility makes it a natural choice for labelling as a National Facility within ACTRIS.

4.1.17 Koninklijk Nederlands Meteorologisch Instituut (KNMI)

KNMI is the Dutch national weather service and centre for climate research. The institute combines in house operational as well as strategic research tasks. As an integral part of the Ministry of Infrastructure and Environment KNMI provides on a day-to-day basis advice on weather and climate to national, regional and local authorities. KNMI is participating in many European projects on both climate and space research and keeps close ties with many of its stakeholders.

KNMI hosts the Cabauw Experimental Site for Atmospheric Research (CESAR), which is the national focal point for atmospheric research and monitoring. CESAR is one of the so-called supersites for climate monitoring in Europe and is an ACTRIS main site where key parameters of the atmospheric state and air quality are measured, including radiation and vertical profiles. CESAR data is used for long-term records, process studies as well as test beds for model evaluation and satellite validation. Advanced techniques for atmospheric profiling are used and are continuously developed. Quality controlled observations are part of several networks, including BSRN, Aeronet, EARLINET, CloudNet and ACTRIS. CESAR is a certified GRUAN site. Through the links with the KNMI space research division has a long-standing experience and expertise with satellite missions observing atmospheric composition including GOME, SCIAMACHY and GOME-2 and plays a leading role in OMI, the Sentinel-5 Precursor/TROPOMI, and the active atmospheric sounders Aeolus and EarthCare.

Role in the project

KNMI leads the Joint Research Unit for CESAR in which TU-Delft, ECN, University Utrecht and TNO are third parties. TU-Delft will act as a linked third party in ACTRIS-PPP. Together with TU-Delft KNMI will contribute to ACTRIS-PPP as a contributor of a national facility (CESAR) and the development and hosting of the cloud radar calibration central facility (WP4-5). They will also contribute to the work packages for the ACTRIS Governance and management (WP1), Legal Framework (WP2), ACTRIS Strategy and long-term vision (WP7), and Socio-economic impact analysis (WP8).

Principal personnel involved

Dr. Arnoud Apituley (male) is senior scientist at KNMI. He has research experience in ground based and space borne remote sensing applications including tropospheric ozone, clouds, aerosols and water vapour. His main interest is in integrating in-situ and ground based and space borne remote sensing techniques, for the study of air quality and climate change at the Cabauw Experimental Site for Atmospheric Research (CESAR). He contributed to and led experimental campaigns for air quality and climate related effects of aerosols and clouds and to several satellite validation studies. He contributed to studies using synergies between different remote sensing techniques and studies linking satellite remote sensing data to ground based observations. He is coordinator of the Sentinel-5p/TROPOMI Level 2 working group and the TROPOMI Level 2 CAL/VAL team. He is vice chair of the WMO CIMO expert team on new remote sensing technologies, member of the GRUAN working group and site representative of the GRUAN site Cabauw/De Bilt. He is an active participant in ACTRIS.

Relevant publications

1. Pappalardo, G., Amodeo, A., Apituley, A., Comeron, A., Freudenthaler, V., Linné, H., Ansmann, A., Bösenberg, J., D'Amico, G., Mattis, I., Mona, L., Wandinger, U., Amiridis, V., Alados-Arboledas, L., Nicolae, D., and Wiegner, M.: EARLINET: towards an advanced sustainable European aerosol lidar network, Atmos. Meas. Tech., 7, 2389-2409, doi:10.5194/amt-7-2389-2014, 2014.
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Brunner, D., Cede, A., Chong, J., Clémer, K., Fayt, C., Frieß, U., Gast, L. F. L., Gil-Ojeda, M., Goutail, F., Graves, R., Griesfeller, A., Großmann, K., Hemerijckx, G., Hendrick, F., Henzing, B., Herman, J., Hermans, C., Hoexum, M., van der Hoff, G. R., Irie, H., Johnston, P. V., Kanaya, Y., Kim, Y. J., Klein Baltink, H., Kreher, K., de Leeuw, G., Leigh, R., Merlaud, A., Moerman, M. M., Monks, P. S., Mount, G. H., Navarro-Comas, M., Oetjen, H., Pazmino, A., Perez-Camacho, M., Peters, E., du Piesanie, A., Pinardi, G., Puentedura, O., Richter, A., Roscoe, H. K., Schönhardt, A., Schwarzenbach, B., Shaiganfar, R., Sluis, W., Spinei, E., Stolk, A. P., Strong, K., Swart, D. P. J., Takashima, H., Vlemmix, T., Vrekoussis, M., Wagner, T., Whyte, C., Wilson, K. M., Yela, M., Yilmaz, S., Zieger, P., and Zhou, Y.: The Cabauw Intercomparison campaign for Nitrogen Dioxide measuring Instruments (CINDI): design, execution, and early results, Atmos. Meas. Tech., 5, 457-485, doi:10.5194/amt-5-457-2012, 2012.

5. Brinksma, E. J., et al. (2008), The 2005 and 2006 DANDELIONS NO2 and aerosol intercomparison campaigns, J. Geophys. Res., 113, D16S46, doi:10.1029/2007JD008808.

Further papers relevant to CESAR see: http://www.cesar-observatory.nl/index.php?pageID=3001

Relevant projects

1. ACTRIS – Aerosol Clouds and Trace Gases Infrastructure (2011-2014) - GA 262254, continued as ACTRIS-2 - Aerosol Clouds and Trace Gases Infrastructure 2 (2015-2018) - GA 654109
2. PEOPLE-2011-ITN, 289923, ITARS– Initial training for atmospheric remote sensing (2012-2016)
3. Gaia-Clim - Gap Analysis for Integrated Atmospheric ECV CLImate Monitoring (2015-2017) - GA 640276
4. ARISTOTLE - All Risk Integrated System Towards The hoListic Early-warning - (2016-2018)
5. CAMS84 – Copernicus Atmosphere Monitoring Service Validation (2015-2018)

Significant infrastructures

Description of the infrastructure: The CESAR location (213 m high, 50 km far from North Sea) is ideal for meteorological research on relations between the atmospheric boundary layer, land surface and weather. The site is also representative for long-term atmospheric studies because surroundings do not differ significantly from those in 1972. CESAR is one of very few observatories around the world that monitors such a wide scope of relevant processes in atmospheric chemistry and physics, hydrology and meteorology. CESAR is used as a main satellite validation site.

At CESAR a cloud radar calibration facility is under development that will be tested under ACTRIS-PPP and is expected to become fully operational as a central facility by the end of the PPP project. The cloud radar calibration facility is developed in collaboration with the UK and France.

4.1.18 Paul Scherrer Institut (PSI)

The Paul Scherrer Institut (PSI) in Switzerland is a centre for multi-disciplinary research and one of the world's leading user laboratories. With its 1200 employees it belongs as an autonomous institution to the Swiss ETH domain and concentrates its activities on solid-state research and material sciences, energy and environmental research as well as on biology and medicine. The Laboratory of Atmospheric Chemistry (LAC) at PSI consists of about 50 researchers. It has in-depth experience with the design of experiments to characterize physical and chemical properties of aerosols and has a strong interest in the impact of aerosols on climate. The laboratory operates several smog chamber facilities for atmospheric chemistry simulation, as well as continuous aerosol measurements at the high Alpine research station Jungfraujoch (3580 m asl) which have been performed within the Global Atmosphere Watch (GAW) program of the World Meteorological Organization (WMO) since 1995.

Role in the project

PSI will participate in WP1 representing the Swiss ACTRIS community and in WP5 in defining the ACTRIS requirements for observatory and exploratory platforms.

Principal personnel involved

Prof. Dr. Urs Baltensperger (male) is head of the Laboratory of Atmospheric Chemistry at PSI, and professor at ETH Zürich. He was chairman of the Scientific Advisory Group (SAG) for Aerosols of the Global Atmosphere Watch (GAW) aerosol program of WMO from 1997 to 2009. He is a member of the Research Council of the Swiss National Science Foundation and chairman of the Specialized Committee for International Cooperation. He is author and co-author of about 400 peer-reviewed papers (including 7 in Nature and 5 in Science) and has an h-index of 70. He has supervised about 40 PhD theses and is currently supervising 20 on-going PhD theses. He obtained a number of awards (including the Fellow of the American Geophysical Union in 2012, the Vilhelm Bjerknes Award of the European Geosciences Union in 2014, the Fuchs Memorial Award in 2016), and the Spiers Memorial Award of the Royal Society of Chemistry in 2016.

Dr. Martin Gysel (male) is head of the Aerosol Physics Group in the Laboratory of Atmospheric Chemistry at PSI. He was vice president and president of the Gesellschaft for Aerosolforschung (GAeF) from 2010 to 2014 and he is Secretary General of the International Aerosol Research Assembly (IARA). He was and is PI of several research projects funded by Swiss funding agencies and currently holds an ERC consolidator grant (ERC-CoG, BLACARAT). He is author and co-author of 79 peer-reviewed papers and has an h-index of 34. He is, together with Urs Baltensperger and Ernest Weingartner, the recipient of the 18th Prof. Dr. Vilho Vaisala Award of the WMO.

Relevant publications

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Relevant projects

1. H2020 IA project ACTRIS-2, 1 May 2015 – 30 April 2019, partner.
2. FP7 I3 project ACTRIS, 1 April 2011 – 31 March 2015, partner.
3. FP7 project BACCHUS, project no. 603445, 1 December 2013 – 30 November 2017, partner.
4. FP7 project EUROCHAMP, project no. 228335, 1 May 2009 – 31 March 2015, partner.
5. FP7 project ACCENT-Plus, project no. 265119, 1 November 2010 – 31 December 2014, partner.

Significant infrastructures

Field site: The high alpine research station Jungfraujoch is situated at 3500 m asl in the Swiss Alps. It is the highest research station in Europe that is accessible all year round by rail, and it is the only accessible observation point in Europe with adequate infrastructure that is within the free troposphere most of the year. This special geographical situation offers the opportunity to monitor background concentrations but also to investigate the transport of anthropogenic pollutants from the boundary layer to the free troposphere.

Laboratories: consists of 3 different simulation chambers, a stationary 27 m^3 chamber (air-conditioned at 15 to 30 °C), a mobile 9 m^3 chamber (without own air condition), and a stationary 9 m^3 cool chamber (air-conditioned at 10 to 30 °C). The stationary big chamber has the advantage of an air volume which is important when many instruments sample for long times, such as for intercomparison purposes. The mobile chamber can be brought to any emission source and is therefore especially suited to e.g. evaluate secondary organic aerosol (SOA) formation from test benches. The cool chamber is able to simulate SOA formation also at temperatures below 0°C, which is especially relevant for wood burning emissions, which typically occur at low temperatures. PSI also operates a full suite of state of the art instrumentation for gas phase and aerosol characterization.

Central facilities: PSI supports the central facilities by providing calibrated concentrations of black carbon for intercomparison of related instruments.

[ACTRIS PPP]

4.1.19 Eidgenössische Materialprüfungs und Forschungsanstalt (EMPA)

Eidgenoessische Materialpruefungs- und Forschungsanstalt (EMPA) is a research institute with about 750 employees in the domain of the Swiss Federal Institute of Technology Zurich (ETHZ). The 35 employees of the Laboratory for Air Pollution/Environmental Technology are focused on the measurement and modelling of atmospheric trace components. The laboratory contributes data to the networks of EMEP and GAW by operating 16 sites within the Swiss National Air Pollution Monitoring Network (NABEL). EMPA is well in the scope of ACTRIS PPP as it is the main provider of trace gas data in ACTRIS and related quality assurance and data provision.

Role in the project

In WP4 EMPA is working on the installation and implementation of the Central Facilitiy (CF) for trace gases. In the initial phase the operation of the CF procedures will be thoroughly tested by EMPA and improvements in both the actual process and the transfer of knowledge to users will be suggested. The implemented changes will then be further evaluated in order to reach an optimal compliance with user needs. In WP 6 EMPA will work together with the providers of the CFs on the general definition of access principles and on potentially explicit requirements for the CF on trace gases. In WP7 EMPA will work on the further development of the CFs with a specific focus on the CF on trace gases.

Principal personnel involved

Dr. Stefan Reimann (male) is a Senior Scientist and group leader at EMPA. He is responsible for the continuous measurements of VOCs and NO_x at several sites in Switzerland, amongst which the Jungfraujoch is the highest site in Europe, where these measurements are continuously performed. He is co-author of the report on the WMO/GAW Expert Workshop on Global Long-Term Measurements of VOCs and the author of about 50 research papers.

Relevant publications

1. Helmig, D., S. Rossabi, J. Hueber, P. Tans, S.A. Montzka, K. Masarie, K. Thoning, C.-Plass Duelmer, A. Claude, A.C. Lewis, L. Carpenter, S. Punjabi, S. Reimann, M.K. Vollmer, R. Steinbrecher, J. Hannigan, L. Emmons, E. Mahieu, B. Franco, D. Smale, A. Pozzer, A Reversal of Long-Term Global Trends in Atmospheric Ethane and Propane from the North American Oil and Gas Boom, Nature Geoscience, 2016.
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Relevant projects

1. HORIZON 2020: ACTRIS-2 (Aerosols, Clouds, and Trace gases Research InfraStructure Network)
2. FP7: ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network)
3. FP7: NORS (Network Of Remote Sensing ground-based observations in support of the Copernicus atmospheric service)
4. FP6: GEOMON (Global Earth observation and monitoring)
5. FP5/FP6: SOGE/SOGE-A (continuous measurement of halocarbons was installed in Europe and China)

[ACTRIS PPP]

Significant infrastructures

Together with PSI EMPA is responsible of ACTRIS-related measurements at the high-Altitude site of Jungfraujoch (3850 m asl). Whereas PSI is responsible for analysis of particulate compounds, EMPA is responsible for gaseous comounds (i.e VOCs and NOx).

[ACTRIS PPP]

4.1.20 The Cyprus Institute (Cyl)

The Cyprus Institute (CyI) is a non-profit research and educational institution with a strong scientific and technological orientation. It is an issue oriented institution, emphasizing international collaborations and cross-disciplinary research and post graduate education. CyI is being developed by establishing research centres which address challenging problems that are important at both the regional and international levels. Its research centres are developed in partnership with leading institutions in the respective thematic areas. The Energy, Environment and Water Research Centre (EEWRC) is one the 3 research centres of CyI and currently involved in ACTRIS-2 and participating to ACTRIS PPP.

EEWRC works in close collaboration with the Massachusetts Institute of Technology (MIT), the Max Planck Institute for Chemistry in Mainz, Germany, the Cyprus Research Promotion Foundation (RPF), and many national institutions and organizations in Cyprus and the region on societally relevant issues related to Energy and Renewables, Environment and Climate, and Water and Natural Resources. Over the past few years, EEWRC has proven to be a leader in the area of Environmental and Climate research. The Atmospheric and Climate Research in particular, in close co-operation with the Max Planck Institute for Chemistry (MPIC) in Mainz, Germany, has established CyI as a key player of Climate Research in the region and beyond. In particular, EEWRC has been instrumental in providing evidence that the Eastern Mediterranean and Middle East region (EMME) is a climate change "hotspot" and relating this to public health, ecosystem development and water, to name but a few of the impact sectors considered. These studies have attained international recognition, notably for their emphasis on the EMME. The research has been nationally embedded through strong collaborations with the Ministry of Health, the Ministry of Agriculture, Natural Resources and Environment, and the Ministry of Energy, Commerce, Industry and Tourism.

Role in the project

As confirmed by the Directorate General for European programmes, coordination and development (Republic of Cyprus), the Cyprus Institute is acting as the Cyprus RPO for ACTRIS PPP. It will be involved in WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision). Additionally, the Cyprus Institute will participate to the WP4 (ACTRIS Central facilities), WP5 (ACTRIS National Facilities) and WP6 (ACTRIS Service Provision).

Principal personnel involved

Dr. Jean Sciare (male) is the director of EEWRC at the Cyprus Institute with a tenured Professor position. He was holding a CNRS Research Director Position at LSCE (France) till mid of 2014. He received a PhD in atmospheric chemistry and physics from Paris VII University in 2000 with a dissertation on the "Biogeochemical cycle of dimethylsulfide in the Austral Ocean". After a post-doctoral position on the characterization of Cloud Condensation Nuclei (CCN) at the Max Planck of Chemistry (MPIC) in Mainz (Germany) (Biogeochemistry group of Prof. M.O. Andreae) in 2000-2001, he has obtained a full permanent position in CNRS end of 2001 at LSCE. Research director of CNRS in 2013, he has been leading the Atmospheric chemistry group at LSCE (25 persons) for 2 years from mid-2012.

In the frame of ACTRIS (FP7), J. Sciare has settled the first EU calibration center for on-line aerosol chemical instruments (ACMCC) that is now part of ACTRIS Central Facilities. He has developed a national reference laboratory in analytical chemistry for air quality programs on aerosols. He has more than 15 years of experience in atmospheric chemistry, focusing on the various impacts of aerosols (climate, air quality, health, global security). He has been leading a large number of French research projects (IPEV, ANR, ADEME, CNRS, CEA, PRIMEQUAL) and participated in many EU FP5, FP6, FP7, H2020 projects (ELCID, BIOGEST, OOMPH, LBA-Claire, MEGAPOLI, BACCHUS, ACTRIS, …) performing field campaign in contrasted environments (North/South Pole, Amazonian forest, megacities in Africa, Asia, and Europe, oceanographic cruises, aircraft).

He has coordinated for 20 years atmospheric monitoring activities in the Austral Ocean (Kerguelen, Crozet, and Amsterdam Isl.) in collaboration with the French Polar Institute and WMO-GAW. He has set up the in-situ component of the SIRTA atmospheric station (ACTRIS French National Facility) and is now responsible of the Agia Marina Xyliatou station (ACTRIS Cyprus National Facility). He is (co-)author of more than 100 international refereed publications devoted to atmospheric chemistry and physics. He has received his habilitation in 2009 and has supervised 10 Ph-D students and 4 post-docs. (H index = 31, citation >2500).

Dr. Mihalis Vrekoussis (male) received his B.Sc. in chemistry from the University of Crete, Greece, in 1999. In 2002 and 2005, he received his M.Sc. and Ph.D. degrees in environmental and analytical chemistry from the same university, in collaboration with the Max Planck Institute (Mainz). His Ph.D. thesis was entitled "Nitrate radicals (NO3.): Their role in controlling the Nitrogen cycle and the Oxidizing Capacity of the atmosphere". He has been

employed as a post-doc researcher by the ECPL laboratory in Crete (2005-2006), the IUP institute in Bremen (2006-2009, A.v.Humboldt and Marie Curie fellowships) and the Academy of Athens (2010-2012). Since 2012, he joined the Environmental Energy, Environment and Water Research Center of the Cyprus Institute as a Research Scientist. In 2015, he was elected as a tenured Professor (University of Bremen) and part-time professor (The Cyprus Institute).

M. Vrekoussis has more than 15 years of experience in atmospheric chemistry and physics and he is an author of 42 peer reviewed publications in atmospheric chemistry and physics and many presentations in international conferences. Since 2000, Mihalis worked full time as a principle investigator/scientific partner in 19 national and international projects. He has (co)supervised 1 Ph.D. student and 2 post-docs. (H index = 23, citation >1500).

Relevant publications

1. Sciare, J., K. Oikonomou, O. Favez, Z. Markaki, E. Liakakou, H. Cachier, and N. Mihalopoulos, Long-term measurements of carbonaceous aerosols in the Eastern Mediterranean: Evidence of long-range transport of biomass burning, Atmos. Chem. Phys., 8, 1–13, 2008
2. Vrekoussis, M., Richter, A., Hilboll, A., Burrows, J.P., Gerasopoulos, E., Lelieveld, J., Barrie, L, Zerefos, C, and Mihalopoulos, N: "Economic crisis detected from space: Air quality observations over Athens/Greece", GRL, DOI: 10.1002/grl.50118, 2013
3. Kleanthous, S., Vrekoussis, M., Mihalopoulos, N., Kalabokas, P., Lelieveld, J (2014): On the temporal and spatial variation of ozone in Cyprus", Science of the Total Environment, 476–477 (2014) 677–687.
4. Drinovec, L., G. Močnik, P. Zotter, A. S. H. Prévôt, C. Ruckstuhl, E. Coz, M. Rupakheti, J. Sciare, T. Müller, A. Wiedensohler, and A. D. A. Hansen, The "dual-spot" Aethalometer: an improved measurement of aerosol black carbon with real-time loading compensation, Atmos. Meas. Tech., 8, 1965-1979, 2015
5. Crenn, V., Sciare, J., Croteau, P. L., Verlhac, S., Fröhlich, R., Belis, C. A., Aas, W., Äijälä, M., Alastuey, A., Artiñano, B., Baisnée, D., Bonnaire, N., Bressi, M., Canagaratna, M., Canonaco, F., Carbone, C., Cavalli, F., Coz, E., Cubison, M. J., Esser-Gietl, J. K., Green, D. C., Gros, V., Heikkinen, L., Herrmann, H., Lunder, C., Minguillón, M. C., Močnik, G., O'Dowd, C. D., Ovadnevaite, J., Petit, J.-E., Petralia, E., Poulain, L., Priestman, M., Riffault, V., Ripoll, A., Sarda-Estève, R., Slowik, J. G., Setyan, A., Wiedensohler, A., Baltensperger, U., Prévôt, A. S. H., Jayne, J. T., and Favez, O.: ACTRIS ACSM intercomparison – Part 1: Reproducibility of concentration and fragment results from 13 individual Quadrupole Aerosol Chemical Speciation Monitors (Q-ACSM) and consistency with co-located instruments, Atmos. Meas. Tech., 8, 5063-5087, doi:10.5194/amt-8-5063-2015, 2015.

Relevant projects

1. Coordinator of the ERC Advanced Grant project, C8,Consistent Computation of the Chemistry-Cloud Continuum and Climate Change in Cyprus (2009-2014) (Project reference: 226144)
2. Coordinator of the EU FP7 project DARECLIMED, Data Repositories and Computational Infrastructure for Environmental and Climate Studies in the Eastern Mediterranean (2011-2013) (Project number: 262263)
3. Partner of H2020 IA ACTRIS-2: Aerosol, Clouds, and Trace gases Research Infrastructure (2015-2019) (grant agreement No 654109)
4. Coordinator of the Cyprus Research Promotion Foundation Project APAESO: Autonomous Flying Platforms for Atmospheric and Earth Surface Observations (2010-2014) (NEA ΥΠΟΔΟΜΗ/ΝΕΚΥΠ/0308/09).
5. Partner of EU-FP7 BACCHUS: Impact of Biogenic versus Anthropogenic emissions on Clouds and Climate: towards a Holistic Understanding (2013-2017) (Grant agreement no:FP7-312090)

Significant infrastructures

Agia Marina Xyliatou atmospheric Station (ACTRIS-2 TNA station):

The mission of the Agia Marina Xyliatou atmospheric station is to provide high quality long-term observations of key atmospheric pollutants relevant to air quality and climate change. Located at a rural site of Cyprus, this station is co-operated with the Department of Labour Inspection, in charge of the air quality network in Cyprus. The station is ideally located to document and contrast long-range transported pollution from three continents (Europe, Africa, and West Asia) and dust aerosols from the two largest desert regions in the world (Sahara, Middle East). It offers on-site facilities and supportive infrastructure for research, development and testing of technologies related

to atmospheric measurements. This station benefits from EU funds that facilitate the transnational access of international scientific community on a merit-based priority scheme. Objectives are:

- Provide quality controlled long-term atmospheric observations of key atmospheric pollutants (gases/aerosols) relevant to climate change and air quality; observations that have not been performed previously in the region
- Provide efficient facilities to conduct field research studies, offer hands-on training in educational programs or test new sensors in atmospheric conditions through a transnational access scheme

Unmanned Systems Research Laboratory (USRL):

The USRL offers on-site facilities and supportive infrastructure for research, development and testing of technologies related to UAVs. It takes advantage of other CyI infrastructure like the Instrumentation and analytical laboratories for development and testing of miniaturized sensors under real-world conditions. Established in 2010, the USRL relies on a highly experienced team currently composed of three pilots, two electronic engineers and one mechanical engineer. The team develops and operates a fleet of UAVs, with four medium-sized "Cruisers" (35kg), four small-sized "Skywalkers X8" (5kg), and two rotary-wing aircrafts which are a multi-copter "S1000+" (10kg) and a helicopter "logo 800" (10Kg). The wide range of the fleet enables flights for various locations, from remote to urban environments. USRL comprises the following infrastructure:

- A laboratory (100m²) at the CyI premises dedicated to the development of UAVs and flight preparation, with fully equipped mechanical and electronics workshops.
- A mobile GCS to remotely control UAVs during flights and monitor in real-time the UAV measurement data.
- A private asphalt runway (12x200m) with a hangar and overhead airspace located at our atmospheric ground station Agia Marina Xyliatou.

[ACTRIS PPP]

4.1.21 Instytut Geofizyki Polskiej Akademii Nauk (IGF PAS)

The Institute of Geophysics, Polish Academy of Sciences, hereinafter referred to as IGF PAS (Instytut Geofizyki Polskiej Akademii Nauk, IGF PAN) is a scientific institution representing the main stream of Polish basic research in Earth sciences. It is the only institution in Poland that performs monitoring of geophysical fields in seismology, geomagnetism, and selected areas of atmospheric physics. Research areas of IGF PAS are:

- Seismology and lithospheric research
- Geomagnetism
- Theoretical geophysics
- Atmospheric physics
- Hydrology and hydrodynamics
- Polar and marine research

IGF PAS and University of Warsaw form a Consortium for ACTRIS activities in Poland, reaching beyond ACTRIS PPP. University of Warsaw is the linked third party of IGF PAS in ACTRIS PPP.

Role in the project

IGF-PAS represent the ACTRIS-related science community of Poland in ACTRIS PPP. More specifically IGF-PAS will participate in work packages WP1 (ACTRIS Governance and management), WP2 (Legal Framework), WP3 (Financial Framework), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision). UW will contribute to WPs 4-7.

Principal personnel involved

Dr. hab Aleksander Pietruczuk (male) is an Associate Professor at Department of Atmospheric Physics at IGF PAS. His main expertise is aerosol's optical properties retrieval and analysis as well observational site management. He has been a head of observatory at Belsk and he is PI of AERONET sites at Belsk and Raciborz and EARLINET site at Belsk. (WP1, WP5, WP7).

Dr. Joanna Danilczuk – Zembrzuska (female) is a Head of the International Cooperation and Project Management Department at IGF PAS (WP2, WP3).

Relevant publications

1. Binietoglou, I., et al. (including A. Pietruczuk): A methodology for investigating dust model performance using synergistic EARLINET/AERONET dust concentration retrievals. Atmospheric Measurement Techniques 9 (2015): 3577-3600.
2. Chaikovsky, A., et al. (including A. Pietruczuk): Lidar-Radiometer Inversion Code (LIRIC) for the retrieval of vertical aerosol properties from combined lidar/radiometer data: development and distribution in EARLINET Measurement Techniques 9 (2016), 1181-1205
3. V. Kabashnikov, G. Milinevsky, A. Chaikovsky, N. Miatselskaya, V. Danylevsky, A. Aculinin, D. Kalinskaya, E. Korchemkina, A. Bovchaliuk, A. Pietruczuk, P. Sobolewsky, V. Bovchaliuk: Localization of aerosol sources in East-European region by back-trajectory statistics, International Journal of Remote Sensing 35 (19), (2014) 6993-7006
4. G. Pappalardo, et al. (including A. Pietruczuk): Four-dimensional distribution of the 2010 Eyjafjallajökull volcanic cloud over Europe observed by EARLINET, Atmospheric Chemistry and Physics 13 (2013), 4429-4450
5. G.Pappalardo, et al. (including A. Pietruczuk): EARLINET correlative measurements for CALIPSO: first intercomparison results, doi:10.1029/2009JD012147, J. Geophys. Res., 115, (2010), D00H19,

Relevant projects

1. ACTRIS-2 "Aerosols, Clouds, and Trace gases Research InfraStructure - 2", 2015-2019, partner
2. ACTRIS "Aerosols, Clouds and Trace gases Research Infrastructure Network", 2011-2015, associate partner
3. EPOS Preparatory Phase, 2010- 2014

Significant infrastructures

[ACTRIS PPP]

IGF PAS, UW (LTP) and associate partner's plan to bring into ACTRIS at least one of the observational platforms located at Belsk and Raciborz that are related to ACTRIS-2 project. IGF PAS plans to put effort to establish at least one high performance observational site located in Poland.

[ACTRIS PPP]

4.1.22 Lunds Universitet (ULUND)

Lund University is the strongest research university in Sweden and is consistently ranked among the top 100 universities in the world. The Aerosol Group at the Division of Nuclear Physics, Physics Department, Lund University has conducted climate and health-related aerosol research for more than 30 years. Relevant areas of interest are aerosol measurement technology, aerosol-cloud interactions, source-apportionment studies and aerosol dynamics and atmospheric chemistry modelling.

Role in the project

ULUND contributes to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision). Furthermore, ULUND represents the scientific ACTRIS community of Sweden.

Principal personnel involved

Prof. Dr. Erik Swietlicki (male). Professor in Aerosol Physics and Leader of the Aerosol Group at the Division of Nuclear Physics with more than 30 years of experience in atmospheric aerosol science. His research is motivated by the effects of atmospheric aerosols on climate, environment and human health. Participated in 10 EU projects, including EUCAARI, EUSAAR, FP7 ACTRIS and ACTRIS-2, also as WP and Task Leader. Acted as President of the European Aerosol Assembly and the Nordic Society for Aerosol Research. Awarded (and current) doctorates as main supervisor: 10(1). Faculty Opponent (PhD thesis): 10. Co-editor for the journal "Atmospheric Chemistry and Physics". Co-author of 165 peer reviewed scientific publications. Citations: 6691, h-index: 45.

Dr. Birgitta Svenningsson (female). Senior researcher appointed by the Swedish Research Council. Her main research interests are in the fields of aerosol particle-water interactions and cloud droplet formation as well as in atmospheric formation of aerosol particles from anthropogenic and biogenic precursors. Main supervisor for 2 PhD students and assisting supervisor for 2 current and 4 graduated PhD students. She has been the main supervisor for 3 Post Docs. Author and co-author of 51 peer reviewed scientific publications. Citations: 1994, h-index: 24.

Dr. Adam Kristensson (male). Senior researcher whose current main research interests are in the fields of ship emissions and new particle formation. Responsible for the daily operation of the ULUND ACTRIS site at Vavihill and ICOS/ACTRIS site Hyltemossa. Active in CRAICC and main supervisor for a PhD student performing research at the Vavihill/Hyltemossa field site. Assistant supervisor for 3 PhD students. Co-author of 23 peer reviewed scientific publications. Citations in Web-Of-Science: 844, h-index: 14.

Relevant publications

1. Genberg, J., et al. Light absorbing carbon in Europe – measurement and modelling, with a focus on residential wood combustion emissions. *Atmos. Chem. Phys*., 13(2013)8719-8738.
2. Paasonen, P., et al. Warming-induced increase in aerosol number concentration likely to moderate climate change. *Nature Geoscience*, DOI: 10.1038/NGEO1800, 2013.
3. Sporre, M. K., et al. Aerosol indirect effects on continental low-level clouds over Sweden and Finland. *Atmos. Chem. Phys.*, 14, 12167-12179, doi:10.5194/acp-14-12167-2014, 2014.
4. Crippa, M. et al. Organic aerosol components derived from 25 AMS data sets across Europe using a consistent ME-2 based source apportionment approach. *Atmos. Chem. Phys*., 14, 6159-6176, doi:10.5194/acp-14-6159-2014, 2014.
5. Paramonov, M. et al. A synthesis of cloud condensation nuclei counter (CCNC) measurements within the EUCAARI network. *Atmos. Chem. Phys*., 15, 12211-12229, doi:10.5194/acp-15-12211-2015, 2015.

Relevant projects

1. EU FP6 EUSAAR (European Supersites for Atmospheric Aerosol Research), 2006-2011, Grant agreement no 026140
6. EU FP7 EUCAARI, (European integrated project on aerosol cloud climate and air quality interactions), 2007-2012, Grant agreement no 036833.
2. EU FP7 ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network), 2011-2014, Grant agreement no 262254, continued as ACTRIS-2 (Aerosols, Clouds, and Trace gases Research InfraStructure Network - 2), 2015-2019, Grant agreement no 654109.
3. EU FP7 PEGASOS (Pan-European Gas-Aerosols-Climate Interaction Study), Grant agreement no 265148,

4. the Nordic Top-level Research Initiative and Centre of Excellence CRAICC (Cryosphere-Atmosphere Interactions in a Changing Arctic Climate)

Significant infrastructures

The core facilities related to ACTRIS are a) the ACTRIS field station Vavihill (1999-2016) that is now being moved 18.5 km to collocate with ICOS and the new Hyltemossa (HYM, 2016-) tall tower site, b) extensive instrumentation for aerosol particle measurements and analysis, and c) advanced aerosol laboratory facilities for instrument testing and calibration.

4.1.23 Koninklijk Belgisch Instituut voor Ruimte Aeronomie - Institut royal d'Aéronomie Spatiale de Belgique (BIRA-IASB)

BIRA-IASB was established in 1964 as an independent Federal Scientific Institute. Its mandate is to acquire scientific and technological expertise, and to disseminate information, in the field of space aeronomy. This implies research and service tasks, as well as partnership with commercial organisations like industries. In order to perform these tasks, it is necessary to acquire knowledge based on data from space missions, ground-based instruments, and related means. This knowledge concerns the physics and chemistry of the atmospheres of planets and comets and of interplanetary space, as well as the impact of the Sun on the Earth's atmosphere and magnetosphere, in particular in the context of global changes and space weather, respectively.

BIRA-IASB has a very strong expertise in remote-sensing techniques for studying the atmospheric composition of the Earth, planets and comets, from various platforms (space, aircraft, ground). It uses spectrometric techniques from the UV-visible to the infrared range. It is a key partner in international remote-sensing networks for the monitoring of the Earth atmospheric composition, like the NDACC (Network for the Detection of Atmospheric Composition Changes) – which it is co-chairing since 2013, and TCCON (Total Carbon Column Observing Network). It contributes to ICOS-Belgium. It is PI of NDACC-associated instruments (FTIR and MAXDOAS) in several stations in the world. BIRA-IASB is also recognized internationally for its contributions to the development of satellite products from the GOME-SCIAMACHY-GOME2-OMI (and recently IASI) satellite instruments and it plays a key-role in satellite validation using network data.

Role in the project

BIRA-IASB is the national representative of the Belgian RPOs involved in ACTRIS ESFRI activities. BIRA-IASB contributes to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision).

Principal personnel involved

Prof. Martine De Mazière (female) is researcher at BIRA-IASB since Dec. 1988. At present, she is leading the Infrared Observations team in the 'Sources and Sinks of atmospheric constituents' Division at BIRA-IASB, and is Head of the Division 'Scientific Directorate', and Director General ad interim since June 2011.

M. De Mazière is co-chairman of NDACC since 2013 and PI of NDACC and TCCON FTIR instruments in La Réunion; she is starting the operation of an FTIR instrument in the Amazonian region (Brazil). Recently, she has been the coordinator of the European NORS project that led to the recognition of NDACC as a key network for the validation of CAMS products. At present, she is involved in CAMS, and the EU projects Connectin GEO, GAIA-CLIM and QA4ECV, as well as in the validation of the TROPOMI HCHO, CO and CH4 products using the FTIR networks of NDACC and TCCON, resp. and in the Validation Data Analysis Facility of the S5P Mission performance Center (S5P-MPC). She is deputy coordinator of the ESA project Fiducial Reference Measurements for Greenhouse Gases.

Dr. Michel Van Roozendael (male) is researcher at BIRA-IASB since Jan. 1990. He is currently Head of the 'Atmospheric Reactive Gases' Division and leader of the 'UV-Vis DOAS Research' group. M. Van Roozendael is co-chair of the NDACC UV-Vis working group since 2004 and PI for the BIRA-IASB ground-based DOAS monitoring activities at Uccle (Belgium), Jungfraujoch (Switzerland), Harestua (Norway), OHP (France), Xianghe (China), Bujumbura (Burundi), Reunion Island (France) and Princess Elisabeth Station (Antarctica). He is involved in the ESA Copernicus Sentinel 4, 5 and 5-Precursor level-2 product development activities, the EU QA4ECV and GAIA-CLIM projects, the EUMETSAT O3MSAF and he is science lead for the ESA Ozone_cci and FRM4DOAS projects, the latter being concerned with data harmonization and centralised ground-based DOAS processing in support of satellite validation.

Relevant publications

1. Stavrakou, T., J.-F. Müller, M. Bauwens, I. De Smedt, M. Van Roozendael, M. De Mazière, C. Vigouroux, F. Hendrick, M. George, C. Clearbaux, P.-F. Coheur, and A. Guenther, How consistent are top-down hydrocarbon emissions based on formaldehyde observations from GOME-2 and OMI, Atmos. Chem. Phys., 15, 11861-11884, doi:10.5194/acp-15-11861-2015, 2015.
2. Duflot, V., C. Wespes, L. Clarisse, D. Hurtmans, Y. Ngadi, N. Jones, C. Paton-Walsh, J. Hadji-Lazaro, C. Vigouroux, M. De Mazière, J.-M. Metzger, E. Mahieu, C. Servais, F. Hase, M. Schneider, C. Clerbaux, and P.-F. Coheur, Acetylene (C_2H_2) and hydrogen cyanide (HCN) from IASI satellite observations: global distributions, validation, and comparison with model, Atmos. Chem. Phys., 15, 10509-10527, doi:10.5194/acp-15-10509-2015, 2015.

3. Tack, F., Hendrick, F., Goutail, F., Fayt, C., Merlaud, A., Pinardi, G., Hermans, C., Pommereau, J.-P., and Van Roozendael, M.: Tropospheric nitrogen dioxide column retrieval from ground-based zenith–sky DOAS observations, Atmos. Meas. Tech., 8, 2417-2435, doi:10.5194/amt-8-2417-2015, 2015.
4. Gielen, C., Van Roozendael, M., Hendrick, F., Pinardi, G., Vlemmix, T., De Bock, V., De Backer, H., Fayt, C., Hermans, C., Gillotay, D., and Wang, P.: A simple and versatile cloud-screening method for MAX-DOAS retrievals, Atmos. Meas. Tech., 7, 3509-3527, doi:10.5194/amt-7-3509-2014, 2014.
5. Dils, B., J. Cui, S. Henne, E. Mahieu, M. Steinbacher, M. De Mazière, 1997-2007 CO trend at the high Alpine site Jungfraujoch: A comparison between NDIR surface in situ and FTIR remote sensing observations, doi:10.5194/acp-11-6735-2011, Atmos. Chem. Phys., 11, 6735–6748, 2011.

Relevant projects

1. H2020-QA4ECV (January 1, 2014 – Dec. 31, 2017) – coordinator: KNMI (the Netherlands)
2. H2020-GAIA-Clim (March 1, 2015 – February 29, 2018) – coordinator: NUIG (Ireland).
3. Copernicus Atmospheric Monitoring Service (CAMS)-84: Validation subproject (2015-2018) – coordinator: KNMI (the Netherlands).
4. ESA/PRODEX TROVA (Tropomi Validation): 2016-2018 – coordinator : BIRA-IASB (Belgium).
5. ESA FRM4DOAS (2016-2018) – coordinator: BIRA-IASB (Belgium)

Significant infrastructures

- 3 FTIR instruments and accessories (including a meteo station and a solar tracker for each FTIR instrument);
- 8 MAXDOAS-type instruments;
- IT HPC infrastructure including large storage capacity (of order 1 PByte);
- Engineering facility (mechanics and electronics).

4.1.24 National University of Ireland Galway (NUIG)

The National University of Ireland Galway (NUIG) is a research led university with 18,000 students and 2,400 staff. The Centre for Climate and Air Pollution Studies is a cross-disciplinary and cross-faculty research centre is the research umbrella underwhich climate and air pollution research is conducted. NUIG operates the Mace Head atmospheric physics research station on the West Atlantic coastline of Ireland. The research facility has been operating for more than 50 years.

Role in the project:

NUIG contributes to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision). Furthermore, NUIG represents the scientific ACTRIS community of Ireland.

Principal personnel involved

Prof. Colin O'Dowd (male) is Professor at the School of Physics, NUI Galway, where he is Director of the Centre for Climate & Air Pollution Studies. His research focuses on formation and transformation of atmospheric aerosol, aerosol-cloud-climate interactions and air pollution – climate coupling. He is Chair of the Mace Head committee which is Ireland's leading Earth Observation facility located on the Atlantic-Irish coastline. His research into air pollution-climate interactions has led to ~230 international journal publications (4 in *Nature* and 1 in *Science*), *h*-index of 50 and ~11,000 citations in total. He is ranked in the Thomson-Reuters top 1% cited and "most influential scientific minds" in the world. He was contributing author to the IPCC AR5, author of number of white papers (Ocean acidification, air-pollution – climate interactions) and a range of research-policy driven reports. He participates in/coordinates many international high-profile research projects.

He has been elected *FRMetS*, *FInsP*, 2004 International Smoluchowski Award winner, 2007 recipient of Doctor of Science by the University of Manchester, 2010 Member of the Royal Irish Academy, the 2012 Appleton Award & Medal recipient from the Institute of Physics, the Royal Irish Academy Gold Medal in Geosciences, 2013, and the 2016 Mason medal awarded by the Royal Meteorological Society. He served two terms as Joint Editor-in-Chief of the leading geophysics journal world-wide (*Journal of Geophysical Research [Atmospheres]*), and is currently an Editor with *Nature Scientific Reports*. In addition, prior to his election as honorary member, he has been an unprecedented three-times Co-Chair of the International Committee on Nucleation & Atmospheric Aerosols, Member of the Executive Committee of the International Association of Meteorology and Atmospheric Sciences, ex-officio Member of the International Commission on Clouds and Precipitation, Member of the RIA's Climate Change Science Committee, member of the EPA Advisory Board appoint by the Minister for Environment.

Dr. Darius Ceburnis (male) is a Senior Researcher who provides research and technical support for Mace Head Observatory and Centre for Climate and Air Pollution Studies (CCAPS) at NUI Galway and is a member of Mace Head Management Committee. He is responsible for EMEP activities and the whole physico-chemical measurement programme at Mace Head station and the delivery of quality controlled data to international databases. He has been involved in many national and international research projects providing critical input or as solely responsible investigator. He has published 78 papers and is among the top 1% cited authors in geosciences discipline and is providing support to post-graduate students of CCAPS.

Relevant publications

1. O'Dowd C. D., et al., Connecting marine productivity to sea-spray via microscale biological proceses: Phytoplankton Dance or Death Disco? Nature Scientific Reports, *Scientific Reports* **5**, Article number: 14883 doi:10.1038/srep14883, (2015)
2. O'Dowd, C. D. Ceburnis, J. Ovadnevaite, A. Vaishya, M. Rinaldi, M. C. Facchini, Do anthropogenic, continental or coastal aerosol sources impact on a marine aerosol signature at Mace Head? Atmos. Chem. Phys. 14, 10687 (2014).
3. M. Crippa, F. Canonaco, V. A. Lanz, M. Aijala, J. D. Allan, S. Carbone, . . . A. S. H. Prevot, Organic aerosol components derived from 25 AMS data sets across Europe using a consistent ME-2 based source apportionment approach. Atmos Chem Phys 14, 6159 (2014).
4. C. D. O'Dowd, D. Ceburnis, J. Ovadnevaite, G. Martucci, J. Bialek, C. Monahan, . . . R. McGrath, The Eyjafjallajökull ash plume - Part I: Physical, chemical and optical characteristics. Atmos Environ 48, 129 (2012).
5. G. Martucci, C. D. O'Dowd, Ground-based retrieval of continental and marine warm cloud microphysics. Atmos Meas Tech 4, 2749 (2011).

Relevant projects

[ACTRIS PPP]

1. ACTRIS-2 - Aerosols, Clouds, Trace gases, Research Infrastructure - 2, 2015-2019
2. BACCHUS "Impact of Biogenic versus Anthropogenic emissions on Cloud and Climate" 2013-2017
3. EUCAARI-European integrated project on aerosol cloud climate and air quality interactions, 2007-2012
4. MAP – Marine Aerosol Production. 2004-2007

Significant infrastructures

NUIG hosts the Mace Head atmospheric research facility on the Atlantic coastline. It is one of Europe's most significant background observation stations. It is both a part of WMOs Global Atmosphere Watch (GAW) programme and the European Monitoring and Evaluation Programme (EMEP). The station is also a member of other networks (e.g. AGACE, ICOS, ACTRIS, CloudNet, TROPOF). Atmospheric composition and aerosol parameters have been measured at Mace Head since 1958. The facility operates a sophisticated operational system providing near-realtime delivery of atmospheric composition and meteorological products (every 10 minutes) through its web-casting web-site (www.macehead.org). Its operations include greenhouse gas and CFC/HFC monitoring, real time operational aerosol mass spectrometry and a suite of ground-based remote sensing of cloud physics, aerosol profiles, and atmospheric thermodynamic profiling.

4.1.25 Estonian University of Life Sciences (EULS)

The Estonian University of Life Sciences (EULS) is a public University, organized in 5 institutes and it is the only university in Estonia whose priorities in academic and research activities are centred on sustainable development of natural resources. The academic structure is composed of research and development institutes or institutions, research centres and other structural units. The Estonian University of Life Sciences coordinates and leads the activities at the Station for Measuring Ecosystem Atmosphere Relations (SMEAR Estonia). The Institute of Agricultural and Environmental Sciences and the Institute of Forestry and Rural Engineering are involved in the activities at the SMEAR Estonia station.

Role in the project

EULS is acting as the national focal point in coordinating the activities of ACTRIS PPP in Estonia and will contribute to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision).

Principal personnel involved

Dr. Steffen M. Noe, (male), Senior Scientist, SMEAR Estonia coordinator. His scientific work and experience deals with measuring and mathematical modelling of processes of ecosystem-atmosphere interactions, carbon and nitrogen cycling, environmental adaption strategies. He has started in 2008 the first flux tower measurements in Estonia and planned the SMEAR Estonia station. He has led several national and international measurement campaigns in Estonia and gained strong experience in leading multinational research teams. He is the Estonian representative in the ERA-Planet project, member of the Task Force on reactive Nitrogen (LRTAP). He acts as editor in the special issues of the Integrated Land Ecosystem – Atmosphere Studies (iLEAPS) and Interactions between climate change and the Cryosphere: SVALI, DEFROST, CRAICC in the journals Atmospheric Chemistry and Physics, Bio-geosciences and The Cryosphere.

Relevant publications

1. Noe, S.M., Krasnov, D., Krasnova, A., Cordey, H. P. E. & Niinemets, Ü. (2016). Seasonal variation and characterisation of reactive trace gas mixing ratios over a hemi-boreal mixed forest site in Estonia. Boreal Environment Research, 21, 332-344.
2. Vana, M., Komsaare, K., Hõrrak, U., Mirme, S., Nieminen, T., Kontkanen, J., Manninen, H.E., Petäjä, T., Noe, S.M. & Kulmala, M. (2016). Characteristics of new-particle formation at three SMEAR stations. Boreal Environment Research, 21, 345-362.
3. Noe, S.M., Niinemets, Ü., Krasnova, A., Krasnov, D., Motallebi, A., Kängsepp, V., Jõgiste, K., Hõrrak, U., Komsaare, K., Mirme, S., Vana, M., Tammet, H., Bäck, J., Vesala, T., Petäjä, T., Kulmala, M. & Kangur, A. (2015). SMEAR Estonia: Perspectives of a large-scale forest ecosystem – atmosphere research infrastructure. Forestry Studies, 63, 56-84.
4. Smolander, S., He, Q., Mogensen, D., Zhou, L., Bäck, J., Ruuskanen, T., Noe, S. M., Guenther, A., Aaltonen, H., Kulmala, M. & Boy, M. (2014). Comparing three vegetation monoterpene emission models to measured gas concentrations with a model of meteorology, air chemistry and chemical transport. Biogeosciences, 11, 5425-5443.
5. Noe, S. M., Hüve, K., Niinemets, Ü. & Copolovici, L. (2012). Seasonal variation in vertical volatile compounds air concentrations within a remote hemiboreal mixed forest. Atmospheric Chemistry and Physics, 12, 3909-3926.

Relevant projects

1. ERA-Planet: The European network to coordinate Earth Observation for our changing planet. (2016 -2020)
2. The Pan-Eurasian Experiment (PEEX) project. (since 2012 ongoing)
3. Estonian Environmental Observatory. (since 2010 ongoing)
4. ACTRIS-2 (2015 – 2019)
5. INSMEARIN: Program to increase international cooperation. (2013 – 2015)

Significant infrastructures

The SMEAR Estonia station is maintained by the Institute of Agricultural and Environmental Sciences together with the Institute of Forestry and Rural Engineering of EULS. The measurement station has been built to serve as in-situ monitoring platform of the atmosphere-biosphere interactions and to participate in ACTRIS and other [ACTRIS PPP]

relevant research infrastructures such as ICOS and ANAEE. The set of atmospheric measurements and equipment that already exists covers measurements of atmospheric trace gases and aerosol precursors, air ion and aerosol number concentrations and fluxes.

The SMEAR Estonia station is part of the Estonian Environmental Observatory (EEOBS), which is listed on the Estonian national research infrastructure roadmap. SMEAR Estonia is a comprehensive large-scale research infrastructure to assess atmospheric and ecosystem parameters in-situ. The major objectives are multidisciplinary research and developments to increase understanding of air quality, health and environmental management in current and future climate conditions and to provide decision frameworks to policy makers on environmental and economical sustainability. Contributing national partners are the Institute of Physics of the University of Tartu (UT) and the Estonian Environmental Research Center (EERC) acting as an approved laboratory and monitoring facility of Estonia. The national partners add further measurement locations in Estonia (rural areas and cities) and calibration services.

[ACTRIS PPP]

4.1.26 Department of Environmental Science, Aarhus University (AU)

Aarhus University (AU) was founded in 1928. It has 37.500 students, 1.900 PhD students, 700 postdoctoral scholars and ca 8.000 employees. AU has four faculties: Arts, Science and Technology, Health as well as Business and Social Sciences. The four faculties cover the entire research spectrum from basic research to applied research, strategic research and research based advice to the authorities. In recent years AU has been moving up on the most important university ranking lists. In 2015 the university was number 81 at the Leiden Ranking, and number 106 of 17.000 universities on the Times Higher Education World University Ranking.

Department of Environmental Science (ENVS) at Aarhus University runs basic and problem-oriented research within organic, chemical and physical connections in the environment and within economic, political and social conditions in the interaction between environment and society. The department carries out research-based consultancy for the public sector and provides research-based advice. The academic expertise ranges from atmospheric chemistry and physics towards environmental chemistry, microbiology and biotechnology to environmental economics, environmental geography, political science and sociology. An important task is to provide research-based consultancy for the public sector and advice in the environmental field. We are about 130 employees and students and we work closely together with researchers from many Danish and foreign institutions.

Villum Research Station is a research facility in high Arctic North Greenland (81°36' N, 16°40' W). Aarhus University operates the state-owned research station. The station hosts scientific projects focusing on atmospheric, marine and terrestrial research. Furthermore, long-term monitoring of climate change and its effects on the arctic ecosystems is carried out at the station.

Role in the project:

AU contributes to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision). Furthermore, AU represents the scientific ACTRIS community of Denmark.

Principal personnel involved

Professor Henrik Skov (male) is Research Leader of Villum Research Station and has more than 20 years of experience in Arctic research. He is head of the Arctic activities in the ENVS and leader of several Arctic research projects in Greenland. He has received a grant of 70.5 mil kr. (~9.3 mil €) to construct Villum Research Station. He has 77 published peer reviewed articles. His h-index is 27 and he has been cited 2126 (source Web of Science).

Dr. Andreas Massling (male), Senior Researcher, Department of Environmental Science. Expert in aerosol physics.

Dr. Jacob Klenø Nøjgaard (male), Senior Researcher, Department of Environmental Science. Expert in aerosol chemistry.

Dr. Rossana Bossi (male), Senior Researcher, Department of Environmental Science. Expert in analytical chemistry

Dr. Niels Bohse Hendriksen (male), Senior Researcher, Department of Environmental Science. Expert in microbiology

Relevant publications

1. Hung, H. Katsoyiannis, A.A. Brorström-Lundén, E. Olafsdottir, K. Aas, W. Breivik, K. Bohlin-Nizzetto, P. Sigurdsson, A. Hakola, H. Bossi, R. Skov, H. Sverko, V. Barresi, E. Fellin, P. and Wilson, S. Temporal Trends of Persistent Organic Pollutants (POPs) in Arctic Air: 20 Years of Monitoring under the Arctic Monitoring and Assessment Programme (AMAP). In press Environemntal Pollution January 2016.
2. Evangeliou, N. Balkanski, Y. Hao, W. M. Petkov, A. Silverstein, R. P. Corley, R. Nordgren, B. L. Urbanski, S. P. Eckhardt, S. Stohl, A. Tunved, P. Crepinsek, S. Jefferson, A. Sharma, S. Nøjgaard, J. K. and Skov, H. (2016) Wildfires in Northern Eurasia affect the budget of black carbon in the Arctic. A 12-year retrospective synopsis (2002–2013). ACP in press. doi:10.5194/acp-2015-994, 2016.
3. Uttal, T. Starkweather, S. Drummond, J. Vihma, T. Cox, C. J. Dlugokencky, E. Ogren, J. McArthur, B. Schmeisser, L. Walden, V. Laurila, T. Darby, L. Makshtas, A. P. Intrieri, J. Burkhart, J. Haiden, T. Goodison, B. Maturilli, M. Shupe, M. de Boer, G. Stone, R. Saha, A. Grachev, A. Bruhwiler, L. Persson, O. Lesins, G. Crepinsek, S. Long, C. Sharma, S. Massling, A. Turner, D. D. Stanitski, D. Asmi, E. Aurela, M. Skov, H. Eleftheriadis, K. Virkkula, A. Platt, A. Forland, E. Verlinde, J. Yoshihiroo, I. Nielsen, I. E. Bergin, M. Candlish, L. Zimov, N. Zimov, S. O'Neil, N. Fogal, P. Kivi, R. Konopleva, E. Kustov, V. Vasel,

B. Viisanen, Y. Ivakhov, V. (2015) International Arctic Systems for Observing the Atmosphere (IASOA): An International Polar Year Legacy Consortium. Bulletin of the American Meteorological Society; Doi No: 10.1175/BAMS-D-14-00145.1.

4. Massling, A., Nielsen, I. E., Kristensen, D., Christensen, J. H., Sørensen, L. L., Jensen, B., Nguyen, Q. T., Nøjgaard, J. K., Glasius, M., Skov, H., 2015, Atmospheric black carbon and sulfate concentrations in Northeast Greenland, Atmospheric Chemistry and Physics, Vol. 15, pp. 9681-9692, doi:10.5194/acp-15-9681-2015, available at: www.atmos-chem-phys.net/15/9681/2015/.
5. Nguyen, Q.T. Skov, H. Sørensen, L.-L. Jensen, B. Grube, A. G. Massling, A. Glasius, M. and Nøjgaard, J.K. (2013) Source apportionment of particulate matter at Station Nord, North East Greenland. ACP. Vol. 13, 35–49. www.atmos-chem-phys.net/13/35/2013/doi:10.5194/acp-13-35-2013.

Relevant projects

1. The Danish contribution to AMAP (Arctic Monitoring and Assessment Programme) atmospheric part.
2. CLIF (Climate forcers in the High Arctic)
3. Meteorological, permafrost and pollutant observations in High Arctic
4. ICOS (Integrated Carbon Observing System)

Significant infrastructures

Villum Research Station is a research facility at the military outpost Station Nord in high arctic North Greenland (81°36’ N, 16°40’ W). The station is a substantial upgrade of an existing air pollution monitoring station at Station Nord. Villum Research Station is situated at the north-eastern corner of Greenland, on the small peninsula Princess Ingeborg Peninsula. The nearest town is Longyearbyen on Svalbard (Norway), 720 km east of Station Nord, while the nearest town in Greenland is Ittoqqortoormiit, 1,250 km south of Station Nord. Station Nord is a gateway to the national park of NE Greenland, and a support and refurbishment base for the Danish dog sledge patrol Sirius.

Villum Research Station is owned by the Greenland Government and is being operated by Aarhus University (Denmark) in cooperation with the Danish Defense (the Arctic Command). The station was founded in 2014 based on means provided by the Danish private fund Villum Foundation. The station hosts individual scientific projects focusing on atmospheric, marine and terrestrial research. In addition to this, the station is also used as a permanent base for an extensive long-term monitoring programme with main focus on atmospheric pollution, but also including effects of Climate Change on arctic marine and terrestrial ecosystems.

The station is open for access throughout the year, and it can host up to 14 scientists at a time.

The Villum Research Station is part of a number of networks and programs, including EMEP, GAW, IASOA, INTERACT and NordGIS.

4.1.27 Institute for Nuclear Research and Nuclear Energy (INRNE)

Bulgarian Academy of Sciences (BAS) was founded in 1869 and is one of the oldest institutions in Bulgaria. The mission of BAS is to develop the scientific knowledge in conformity with the human values and the country's national interest. BAS is the leading scientific organization in Bulgaria unifying 41 Institutes in the field of natural sciences and humanities.

At the Bulgarian Academy of Science there are two different institutes that are involved in ACTRIS activities: The Institute for Nuclear Research and Nuclear Energy (INRNE-BAS) and The Institute of Electronics (IE-BAS). The Bulgarian participation in ACTRIS PPP is represented by INRNE-BAS.

INRNE-BAS is the leading Bulgarian Institute for fundamental and applied researches in the field of elementary particles and nuclear physics, high energy physics and nuclear energy, radiochemistry, radioactive wastes treatment, monitoring of the environment and scientific instrumentation development. The Institute's staff of about 350 (150 of them are scientific researchers) works in more than 30 research groups. Besides the representation, INRNE runs the atmospheric measurement site BEO Moussala.

IE-BAS is the leading Bulgarian Institute for fundamental and applied researches in the field of LIDAR and remote sensing of the atmosphere & Earth. The Institute's scientific staff is bout of about 120 researchers in 12 laboratories. The LASER RADARS Laboratory (LRL), founded in 1975 is one of the leading laboratories in IE-BAS with a present staff of 12 researchers. It is also in charge of the Sofia Lidar Station.

Role in the project

The role of INRNE in ACTRIS PPP is to act as the voice of Bulgarian ACTRIS community in shaping the research infrastructure. INRNE participates in work packages WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and WP7 (ACTRIS Strategy and long-term vision).

Principal personnel involved

Assistant Prof. Ivo Kalapov (male) is deputy head of the lab at INRNE-BAS, responsible for the engineering and maintenance. He is also in charge of the BEO Moussala measurement site. His main research areas are scientific instrumentation, climatology, physical and optical property of aerosols. He has been the national level coordinator in the projects mentioned below, and has been the person in charge of data submission.

Prof. Dimitar Stoyanov (male) is former head of Laser Radars Lab at IE-BAS. His research focus is in the area of remote sensing and lidars. He has been leader in several local and national projects in the roles of coordinator and being responsible for data management and submission.

Relevant publications

1. Chorbafjieff, A., Angelov, C., Arsov, T., Nikolova, N., Kalapov, I., Boyadjieva, A., Sahara dust events over South-Western Bulgaria during the late spring of 2013. Proceedings of the Bulgarian Academy of Sciences, 68, 10, Academic Publishing House, 2015, ISSN:1310 - 1331, 1229 - 1234. SJR:0.21, ISI IF:0.284
2. Ivo Kalapov, Todor Arsov, Petar Nojarov, Jordan Stamenov. Some connections between aerosols, atmospheric transport, and relative humidity at peak Musala. Theoretical and applied climatology, 115, 3, Elsevier - Springer, 2014, ISSN:0177-798X, 471 - 482. ISI IF:2.015
3. D.Stoyanov, I.Grigorov, G.Kolarov, Z.Peshev, T.Dreischuh, "LIDAR Atmospheric Sensing by Metal Vapor and Nd:YAG Lasers", Chapter 14 in "Advanced Photonic Sciences", M. Fadhali, Ed., Intech, ISBN: 978-953-51-0153-6 (2012) pp. 345-374.
4. L.Gurdev, T.Dreischuh, D.Stoyanov, Chapter 13 "Deconvolution of Long-Pulse Lidar Profiles", in "Lasers – Applications in Science and Industry", K. Jakubczak, Ed., InTech, ISBN 978-953-307-755-0 (2011), DOI: 10.5772/24134, pp. 249-276.
5. Meier J., I. Tegen, I. Mattis, R. Wolke, L. Alados Arboledas, A. Apituley, D. Balis, F. Barnaba, A. Chaikovsky, M. Sicard, G. Pappalardo, A. Pietruczuk, D. Stoyanov, F. Ravetta, and V. Rizi "A regional model of European aerosol transport: Evaluation with sun photometer, lidar and air quality data", Atmospheric Environment, 47, pp. 519-532 (2012) . doi: 10.1016/j.atmosenv.2011.09.029

Relevant projects

1. H2020 ACTRIS-2 (4 years) "Aerosols, Clouds, Trace gases, Research Infrastructure - 2" 2015-2019; Grant Agreement No 654109

[ACTRIS PPP]

2. FP7 ACTRIS I3 (4 years) “Aerosols, Clouds, Trace gases, Research Infrastructure” 2011 – 2015; ACTRIS Grant Agreement N° 262254
3. FP7 BACCHUS ENV-2013 (4 years) “Impact of Biogenic versus Anthropogenic emissions on Cloud and Climate” 2013-2017; Grant Agreement No 603445
4. FP5 EARLINET (4 years) “European Aerosol Research Lidar Network to Establish an Aerosol Climatology” 2000 – 2003; Contract No EVR1-CT-1999-40003.

Significant infrastructures

In the high mountain environmental station “BEO Moussala” INRNE-BAS carries out regular measurements and studies in the field of aerosols (physical and optical properties of aerosols), radioactivity in aerosols and radioactivity the atmosphere. Atmosphere and trace gases (CO2, NOx) are monitored also.

The Sofia LIDAR station to the IE-BAS is a member of European Lidar Network (EARLINET) since 2002 and provides data from its 3 lidars.

4.1.28 European Commission - Joint Research Centre – Institute for Environment and Sustainability (JRC)

As the European Commission's science and knowledge service, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle. The JRC is a key player in supporting successful investment in knowledge and innovation foreseen by the Horizon 2020 Work Programme. An initiative to open up the JRC infrastructures and associate them to the European Strategy Forum on Research Infrastructures is ongoing.

JRC-IES, the Institute for Environment and Sustainability, is one of the seven institutes that constitute the Joint Research Centre (JRC) of the European Commission. The mission of the IES is to provide scientific and technical support to EU policies for the protection of the environment, and the more efficient and sustainable management of natural resources at global and continental scales.

The IES encompasses eight units, of which the Air and Climate Unit provides scientific support for the development and monitoring of European policies in the area of urban, regional and global air pollution and climate change. The Air and Climate Unit is currently involved i.a. in monitoring air pollution and greenhouse gases, and in the harmonization of atmospheric measurement techniques, based on 2 major infrastructures: the Atmosphere-Biosphere-Climate Integrated monitoring Station, and the European Reference Laboratory for Air Pollution, which have been providing measurement data and calibration services under ACTRIS and ACTRIS-2.

Role in the project

JRC-IES will participate in organising the various ACTRIS bodies, coordinating and supporting the collaborative work between European and national levels, and ensuring the appropriate contacts and communication with decision-makers (WP 1). JRC-IES will take part the elaboration of the technical concepts and requirements which shall apply to the ACTRIS observational sites: instrumentation operation and data-evaluation procedures, products, and data delivery (WP 5). JRC-IES will contribute to the definition the future evolution of ACTRIS, including its integration as a service provider for ESA, COPERNICUS, observing networks and modelling initiatives, its strategy to respond to emerging challenges including new technologies (WP7).

Principal personnel involved

Dr. J.P. Putaud (male) has been managing the integrated monitoring station in Ispra (IT) for close to 15 years. He has more than 25 years of experience in aerosol chemistry and physics, especially on field sampling and analysis of gaseous and particulate species at low concentrations. He is a member of the EMEP Task Force on Measurements and Modelling. He is an active member of 3 CEN working groups addressing the standardisation of aerosol measurements. He (co-) authored more than 70 peer-reviewed papers in atmospheric chemistry and physics published in international journals, and he is Associate Editor of AMT. He participated in 10 EC funded projects.

Relevant publications

1. Putaud, J.P., and 38 co-authors, A European Aerosol Phenomenology - 3: physical and chemical characteristics of particulate matter from 60 rural, urban, and kerbside sites across Europe, Atmos. Environ. 44, 1308-1320, 2010.
2. Cavalli, F., Viana, M., Yttri, K. E., Genberg, J., and Putaud, J.-P.: Toward a standardised thermal-optical protocol for measuring atmospheric organic and elemental carbon: the EUSAAR protocol, Atmos. Meas. Tech., 3, 79-89, doi:10.5194/amt-3-79-2010, 2010.
3. Putaud, J.P., F. Cavalli, S. Martins dos Santos, and A. Dell'Acqua, Long-term trends in aerosol optical characteristics in the Po Valley, Italy, Atmos. Chem. Phys., 14, 9129–9136, 2014.
4. Cavalli, F., A. Alastuey, H. Areskoug, J. Cech, D. Ceburnis, J. Genberg, R.M. Harrison, J.L. Jaffrezo, G. Kiss, P. Laj, N. Mihalopoulos, N. Perez, P. Quincey, J. Schwarz, K. Sellegri, G. Spindler, E. Swietlicki, K.E. Yttri, W. Aas, and J.P. Putaud, A European aerosol phenomenology -4: harmonized concentrations of carbonaceous aerosols at 10 regional background sites across Europe, Atmos. Environ., accepted.
5. Calibration services for organic and elemental carbon analysers provided since 2006 to partners and associated partners in the EU-funded projects EUSAAR, ACTRIS, and ACTRIS-2, as well as to National Reference Laboratories for Air Pollution. About 240 accesses so far.

Relevant projects

1. EARLINET-ASOS (5 years), associated partner, grant agreement No 025991
2. EUSAAR (5 years), grant agreement No 026140

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3. ACTRIS (4 years), grant agreement No 262254
4. ACTRIS-2 (4 years), grant agreement No 654109

Significant infrastructures

Central Facility Component: the JRC-IES runs the European Laboratory for Air Pollution, which provides calibration services for air pollution measurements (incl. NOx, O_3, CO, SO_2, BTEX, PM, OC and EC) to e.g. the National Reference Laboratories from the EU member states.

Observational platform: the JRC-IES runs the Atmosphere-Biosphere-Climate Integrated monitoring Station, which integrates measurement of greenhouse gases (in partnership with ICOS), aerosol, O_3 and their precursors. Observations started about 30 years ago under the EMEP and AERONET programs, and have included aerosol physics in-situ measurements and vertical profiling since 2004-2006.

4.2 Third parties involved in the project (including use of third party resources)

4.2.1 Ilmatieteen laitos (FMI) (Coordinator)

No third parties involved.

4.2.2 Helsingin yliopisto (UHEL)

No third parties involved.

4.2.3 Consiglio Nazionale Delle Ricerche (CNR)

No third parties involved.

4.2.4 Centre National de Recherche Scientifique (CNRS)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[1]	Y

University Grenoble Alpes (UGA)

CNRS forms two Joint Research Units with UGA and Lille 1.

UGA is located in the middle of the Rhône-Alpes region, 2nd French region in terms of research activities. It is a research-intensive university in an international and high tech environment with 45 000 full time students, of which 3 100 doctoral students which enhanced nearly 700 theses submitted each year. It comprises 3 000 lecturers and researchers and 2 500 administrative and technical staff, 80 laboratories organised in six core areas: Mathematics- Information sciences-Technologies-Communication; Chemistry-Life sciences-Health-Biotechnologies; Particle physics-astrophysics-geosciences-Environment-Ecology; Material sciences-Nanosciences-Engineering; Law-Political sciences-Economy-Sociology-Management; Arts-Humanities-Social sciences. The University Grenoble Alpes is a partner of major international and national research centres are located in the Grenoble area as ESRF, ILL, EMBL, CEA. UGA has a long-standing experience in European framework programmes (FP) with participation more than 100 projects under the FP6 and FP7. UGA will be involved in WP1-8.

Université de Lille, 1 Sciences et Technologies (Lille 1)

Lille 1 is one component of the University of Lille, North of France. Located at Cité Scientifique in Villeneuve d'Ascq, south of Lille city, Lille 1 has more than 1600 lecturers and researchers, teaching to about 20 000 students and working in 39 Research Units mostly associated to CNRS. The main fields are mathematics, Physics, Chemistry, Earth and Environment Sciences, Computer, and Electronic sciences and Economy. Recently the observatory (OSU-Nord) was created.

In ACTRIS, Lille 1 University will provide the unique calibration, maintenance and training infrastructures, operated by LOA laboratory in the framework of AERONET, which is expected to be a major component of AERONET Calibration Centre in ACTRIS. Innovative aerosols retrievals code (GRASP), used for processing ground-based and satellite data, has also been developed at the university (in LOA). Additionally, ICARE UMS, now part the national AERIS center, will manage the processing of ground-based data and distributes them to the ACTRIS-2 Data Center. The leader of AERONET-EUROPE is a permanent professor in this University, and a part of the technical staff

[1] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

involved is from Lille 1, while other technical staff are CNRS members. The creator of the powerful GRASP/GARRLIC aerosol inversion software is from LOA. Lille 1 will be involved in WP4 (AERONET-Europe, GRASP/GARRLIC development), WP6, 7.	
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.5 National Institute of R&D for Optoelectronics (INOE)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	Y
INOE intends to subcontract the SWOT analysis and the Foresight in WP4 (estimated cost 20 800€). Although ACTRIS experts will provide the necessary technical information, the actual organization of activities (questionnaires, Delphi surveys, scenario workshops, etc.), the compilation of results and in-depth analysis will be realized by an independent organization, with a significant experience in structuring the debate on possible futures to ensure the emergence of collective intelligence. An example of such organization is the Romanian Institute for Economical and Social Research and Surveys – IRECSON (http://site.irecson.ro/)	
Does the participant envisage that part of its work is performed by linked third parties[2]	N
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.6 Český Hydrometeorologický Ústav (CHMI)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[3]	Y

[2] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

[3] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

CMHI and the Czech linked third parties ICPF, GCRI and MU form a national ACTRIS CR consortium in Czech Republic, defined by a Memorandum of Understanding between the partners.

Institute of Chemical Process Fundamentals, Academy of Sciences of the Czech Republic – monitoring and research of atmospheric aerosols

ICPF serves as a center for fundamental research in chemical, biochemical, catalytic, and environmental engineering. Besides these activities, ICPF acts as a graduate school for Ph.D. studies in the field of chemical, biochemical, environmental engineering and processes, physical chemistry, organic chemistry, industrial chemistry, and biotechnology. The Laboratory of Aerosol Chemistry and Physics (LACP) of the ICPF participating in the project is the leading aerosol research group in the Czech Republic. In the past decade, the group has participated in several EC funded projects, namely SUB-AERO, URBAN-AEROSOL, URBAN-EXPOSURE, EUSAAR, EUCAARI, ACTRIS and ACTRIS-2. Starting in 2013, the laboratory is a partner in the Marie Curie International Training Network HEXACOMM. During the past 5 years, senior team members have served as PIs in several nationally funded projects in the field of aerosol research.

In ACTRIS PPP, LACP will cooperate mainly on measurement and data processing of chemical and physical aerosol properties, contributing to WP1, WP4, WP5 and WP7. The principal person from ICPF contributing to ACTRIS PPP is **Dr. Vladimír Ždímal (male).**

Global Change Research Centre, Academy of Sciences of the Czech Republic - monitoring and research of atmospheric aerosols, link to ICOS

Global Change Research Institute CAS (GCRI) is a public research institution in Brno, Czech Republic. GCRI was established under the name of Global Change Research Centre CAS in 2010 under the OP RDI project CzechGlobe – Center for global climate change impacts studies (CZ.1.05/1.1.00/02.0073), priority axis 1 European Centres of Excellence. GCRI is the successor institution of Global Change Research Centre CAS, and continues in 25-year tradition of fundamental research of global change and the carbon cycle. GCRI (www.czechglobe.cz) is a European center of excellence which with using of modern techniques and instrumentation investigates ongoing global change and its impact on the atmosphere, biosphere and human society. GCRI will participate in the project through the Department of Atmospheric Matter Fluxes and Long-range Transport, which is focused on securing and using measurements carried out at Atmospheric Station Křešín u Pacova. Scientific strategy of the department is investigation of relations between climate change and air quality, based on measurements of chemical substances in the atmosphere which play a crucial role in both phenomenon.

CGRI will bring into ACTRIS PPP their expertise in advanced field measurements. CGRI will be involved in WP1, WP4, WP5 and WP7. The principal person from CGRI contributing to ACTRIS PPP is **Dr. Alice Dvorská (female).**

RECETOX - Research Centre for Toxic Compounds in the Environment, Masaryk University, Brno – monitoring and research of organic compounds

The Research Centre for Toxic Compounds in the Environment (RECETOX) is an independent department of the Faculty of Science, Masaryk University, Brno, Czech Republic. A long term mission of the RECETOX is to perform excellent research and apply its results to protect human health and the environment.

From the beginning, Center has been involved in number of international networks and projects. One of the major partners is the Czech Hydrometeorological Institute (CHMI). In cooperation with CHMI, the Center established the program of integrated monitoring of POPs in environmental matrices at the Central European background station in Košetice. Since 1996, originally designed and developed monitoring system has been included in number of international programs, where it provides unique data on long-term trends of POPs atmospheric contaminants at European background. EMEP (European Monitoring and Evaluation Programme) is one of the most important international networks using data. It is a collaborative project addressing monitoring and long-range transport of pollutants in Europe. Network of EMEP stations was established to support international Conventions, namely CLRTAP - Convention on Long-range Transboundary Air Pollution, and the network is now one of the most important European tools in atmospheric protection. In the area of field studies, RECETOX guarantees also its own national and international

network for monitoring of POPs in ambient air called MONET (MOnitoring NETwork). RECETOX will bring in ACTRIS PPP its expertice in gas-phase measurements of organic pollutants. RECETOX will contribute to WP4 and WP5, the main contributing person being **Prof. Jana Klánová (female)**.	
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.7 Leibniz-Institut für Troposphärenforschung e.V (TROPOS)

No third parties involved.

4.2.8 Karlsruher Institut für Technologie (KIT)

No third parties involved.

4.2.9 National Observatory of Athens (NOA)

No third parties involved.

4.2.10 Norsk institutt for luftforskning (NILU)

No third parties involved.

4.2.11 Universitat Politècnica de Catalunya (UPC)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[4]	Y

In this project UPC is leading a Joint Research Unit with a long history of co-operation. From this JRU the following institutions are linked third parties to UPC in this project:

Barcelona supercomputing Center (BSC)

The Barcelona Supercomputing Center – Centro Nacional de Supercomputación (BSC) is is the Spanish national supercomputing facility and a hosting member of the PRACE distributed supercomputing infrastructure. The Center houses MareNostrum, one of the most powerful supercomputers in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific and societal progress.

The Earth Sciences Department is one of the four BSC departments and has the goal to apply the latest advances of high performance computing and big data to earth system modelling. The department is organized around four closely interacting groups: Climate Prediction, Computational Earth Sciences, Earth Sciences Services, and Atmospheric Composition, which is the group involved in this proposal. The Atmospheric Composition group aims at better understanding the chemical composition of the atmosphere and its effects upon air quality, weather and climate, while improving

[4] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

predictions from local to global scales. This goal is addressed through the development and use of the NMMB/BSC Chemical Transport Model (NMMB/BSC-CTM; http://www.bsc.es/earth-sciences/nmmbbsc-project), an online multi-scale non-hydrostatic chemical weather prediction system that can be run either globally or regionally, and includes aerosol data assimilation. A core activity of the group is mineral dust modelling and forecasting from regional to global scales. As a result of this expertise, the BSC hosts, in collaboration with the Spanish meteorological agency (AEMET), both the Regional Center for North Africa, Middle East and Europe of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS; http://sds-was.aemet.es/), and the WMO first Regional Specialized Meteorological Center with activity specialisation on Atmospheric Sand and Dust Forecast, known as the Barcelona Dust Forecast Center (http://dust.aemet.es/).

BSC effort is mainly concentred in the performance of the WP7 entitled "ACTRIS Strategy and long-term vision".

Research Center on Energy, Environment and Technology (CIEMAT)

CIEMAT- Research Center on Energy, Environment and Technology, is a public research body with several centers in different Spanish regions. Its main activity is structured around technical Departments which form a bridge between R&D&I and social interest goals. Although the strategic lines of action of CIEMAT are focused on the study, development, promotion and optimisation of energy sources such as: renewable energies, nuclear fusion, nuclear fission and fossil fuels, the environmental issues and the research related activities are the main goals of its Department of Environment. Within this, atmospheric pollution can be considered as one of its strongest fields of expertise, as measurement and characterization of atmospheric processes involving gaseous pollutants and aerosols have been the main focusses of interest for more than 25 years.

The Group involved in this proposal operates and maintains in the CIEMAT site in Madrid an EARLINET Lidar station that has participated in EARLINET-ASOS (FP6), ACTRIS (FP7), ACTRIS-2 (H2020) projects and is presently an ACTRIS station with profiling and in-situ monitoring. It counts also with an important set of modern instruments for in situ measurements of ambient aerosol properties (optical, online chemical speciation, aerosol formation processes) to improve the understanding on physico-chemical processes related with atmospheric aerosols and the atmosphere.

CIEMAT will contribute in this proposal to WP1 (ACTRIS Governance and management), WP2 (Legal Framework) and WP5 (ACTRIS National Facilities).

Instituto Nacional de Técnica Aeroespacial (INTA)

INTA (Spanish acronym for National Institute for Aerospace Technology) is a public institution, specialized in aeronautic and aerospace research and development. The institute develops R+D and commercial activities. INTA has a total staff of about 1400, more than 1000 dedicated to R&D activities, testing and certification. The Atmospheric branch (AIIA), a part of the Earth Observation, Remote Sensing and Atmosphere Department, is devoted to the physic-chemistry experimental research and monitoring activities in the field of the terrestrial atmosphere. Both commercial and home made hi-tech multi-platform instrumentation is used for this purpose (including satellite, balloon-borne, aircraft and ground-based). Stratospheric ozone, Aerosols monitoring, Air quality and UV radiation, and their impacts on nature are main fields of interest.

AIIA runs an Atmospheric Observational Station in South West Spain since 1974. AOD measurements started on 1999 whereas "in-situ" size distribution data base extends from 2004 to date. Monitoring of aerosol extinction profiles has been implemented in 2016. Other measurements are aerosols scattering, meteo data, O3, NOx, CO, SO2, solar radiation (from UV to NIR), etc. Two micro-pulse single-wavelength aerosol lidars are routinely in operation at Tenerife (Canary Islands, MPLNET station, since 2005) and Antarctica. AIIA also holds a long experience on state-of-the-art DOAS activities since 1988 which has been extended to MAXDOAS in last years. Gases profiles are simultaneously retrieved in El Arenosillo, Subtropical and Antarctic stations in clean background. Aerosols inversion is underway.

INTA will contribute in this proposal to WP1 (ACTRIS Governance and management), WP5 (ACTRIS National Facilities) and to WP7 (ACTRIS Strategy and long-term vision).

Universidad de Granada (UGR) The University of Granada (Universidad de Granada, UGR, Granada, Spain) is a public institution, one of the largest universities in Spain, devoted to the higher education and research in the fields of architecture, humanities, health sciences, law, experimental sciences and engineering. The Atmospheric Physics Group (GFAT) of the Andalusian Institute for Earth System Research (IISTA-CEAMA) develops its research activity on the different components of the Earth energy balance. Along the last two decades the group gained a good experience in the study of aerosol, clouds and their interaction with the atmospheric radiation field, using in-situ and remote sensing, passive and active, tools combined with the use of retrieval algorithms of microphysical properties for non-spherical aerosols, based on T-matrix kernels. The group has also a good skill on the use of eddy covariance techniques applied to the study of turbulent exchanges between surface and atmosphere, with special focus on greenhouse gases. UGR is part of EARLINET and AERONET networks. The University of Granada, UGR, operates a station located in Granada (37.164 N, 3.605 W, 680 m) belonging to the Andalusian Institute for Earth System Research, IISTA_CEAMA of the University of Granada, which combines long-term monitoring of vertical distribution of atmospheric aerosol, based on active and passive remote sensing, with in-situ measurements for the characterization of aerosol particles, as well as the monitoring of atmospheric and solar radiation at several spectral ranges. UGR includes additional facilities in Sierra Nevada Mountains, which due to their proximity offer a unique opportunity to combine the vertical remote sounding of the atmospheric column from UGR station with in-situ measurements at different elevations in Sierra Nevada slopes. The high mountain station allows for the characterization of regional and long-range transport episodes and for the validation of inversion algorithms used to retrieve aerosol microphysical properties with LIDAR techniques. UGR will contribute in this proposal to WP3 (Financial framework), to WP5 (ACTRIS National Facilities), and to WP8 (Socio-economic impact analysis).

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.12 Agencia Estatal Consejo Superior de Investigaciones Cientificas (CSIC)

No third parties involved.

4.2.13 Universidad de Valladolid (UVA)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[5]	Y
The Izaña Observatory of the Spanish Meterological Agency (AEMET) The Izaña Observatory of the Spanish Meterological Agency (AEMET) was inaugurated on 1st. January, 1916. It has a long history of meteorological observations for more than 100 years,	

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especially radiation data. The unique location of the Izaña Atmospheric Research Center, allows in particular the absolute calibration of the master photometer instruments, necessary for the calibration of AERONET field photometers. Izaña has been declared in July 2014 as Testbed station for Aerosols and Water Vapor Remote Sensing Instruments by the Commission for Instruments and Methods of Observations of the World Meteorological Organization (http://www.wmo.int/pages/prog/www/IMOP/Testbeds-and-LC.html). The Izaña Atmospheric Research Center of AEMET, is formally a linked third party to UVA through a Joint Research Unit between UVA and AEMET. In the AERONET-Europe CF, the activity related to absolute calibration of reference instruments and testing of new instrumentation is carried out at Izaña facility. AEMET will contribute to WP1 and WP4, with **Dr. Emilio Cuevas-Agulló (male)** being the main contributor.

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.14 University of Manchester (UMAN)

No third parties involved.

4.2.15 National Environmental Research Council (NERC)

No third parties involved.

4.2.16 Science and Technology Facilities Council (STFC)

No third parties involved.

4.2.17 Koninklijk Nederlands Meteorologisch Instituut (KNMI)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[6]	Y
Delft University of Technology (TU Delft) TU Delft is one of the leading and largest technical universities in Europe. The TU Delft Climate Institute is a research institute of the university dedicated to pre-competitive research in the fields of radar and telecommunication. The work of this project fits in the research program of the remote sector, which aims to develop innovative measurement techniques, systems and methodologies for the observation of natural at large distances, to translate relevant research expertise into educational programs, and to educate students by involving them in cutting edge research programs. The key elements in the research program are: 1) Experimental research of clouds and precipitation with radar. 2) Theoretical research of the scattering process. 3) The inverse problem: how to retrieve geo-physical parameters from the radar data? 4) Sensor synergy: how to combine different sensors to	

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optimize the retrieval of atmospheric parameters? TUDelft is very experienced in atmospheric remote sensing, most notably clouds and precipitation in relation to boundary layer process, applied to weather prediction and improved understanding of climate change. TU Delft will contribute to the development and implementation of the cloud radar calibration central facility and to the testing of the facilities (WP4). TU Delft will also contribute to the ACTRIS strategy and long-term vision (WP7). KNMI leads the Joint Research Unit for CESAR in which TU-Delft, ECN, University Utrecht and TNO are third parties. TU-Delft will act as a linked third party in ACTRIS-PPP, being in charge of the Dutch contribution to defining, implementing and exploiting the Cloud Radar Calibration Centre in WP4 and WP7. The main contributor at TU-Delft is **Prof. Dr. Herman Russchenberg (male)**.	
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.18 Paul Scherrer Institut (PSI)

No third parties involved.

4.2.19 Eidgenössische Materialprüfungs und Forschungsanstalt (EMPA)

No third parties involved.

4.2.20 The Cyprus Institute (CyI)

No third parties involved.

4.2.21 Instytut Geofizyki Polskiej Akademii Nauk (IGF PAS)

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	**N**
Does the participant envisage that part of its work is performed by linked third parties[7]	Y

[7] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

The University of Warsaw Linked third party involved in the project is University of Warsaw, with which IGF PAS has signed a Consortium Agreement for ACTRIS activities in Poland, reaching beyond ACTRIS PPP. The University of Warsaw (UW) was founded in 1816 and it is a non-profit public university. The University comprises a total number of 20 research units and 20 faculties, among others the Faculty of Physics, which includes Institute of Geophysics, University of Warsaw, participating in ACTRIS PPP. In the frame of ACTRIS PPP, UW will bring in its expertise in aerosol radiative properties estimations, in situ aerosol measurements and LIDAR remote sensing. The work done at UW will contribute to WPs 4-7, with the main contributor being **Dr. Iwona Stachlewska (female)**.

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.22 Lunds Universitet (ULund)

No third parties involved.

4.2.23 Koninklijk Belgisch Instituut voor Ruimte Aeronomie - Institut royal d'Aéronomie Spatiale de Belgique (BIRA-IASB)

No third parties involved.

4.2.24 National University of Ireland Galway (NUIG)

No third parties involved.

4.2.25 Estonian University of Life Sciences (EULS)

No third parties involved.

4.2.26 Aarhus Universitet (AU)

No third parties involved.

4.2.27 Institute for Nuclear Research and Nuclear Energy (INRNE)

No third parties involved.

4.2.28 European Commission - Joint Research Centre – Institute for Environment and Sustainability (JRC)

No third parties involved.

Section 5: Ethics and security

5.1 Ethics

No Ethics issues were entered

5.2 Security

Please indicate if your project will involve:

NO activities or results raising security issues: (NO)

NO 'EU-classified information' as background or results: (NO)

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