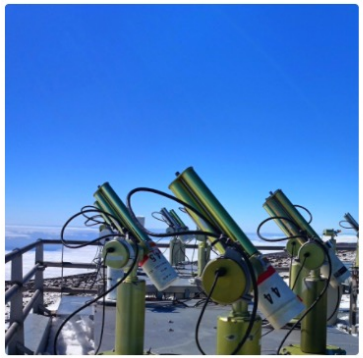
The Aerosol, Clouds, and Trace Gases Research Infrastructure

Exploring the Atmosphere

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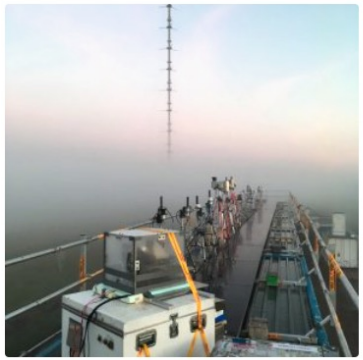
WHAT IS ACTRIS?









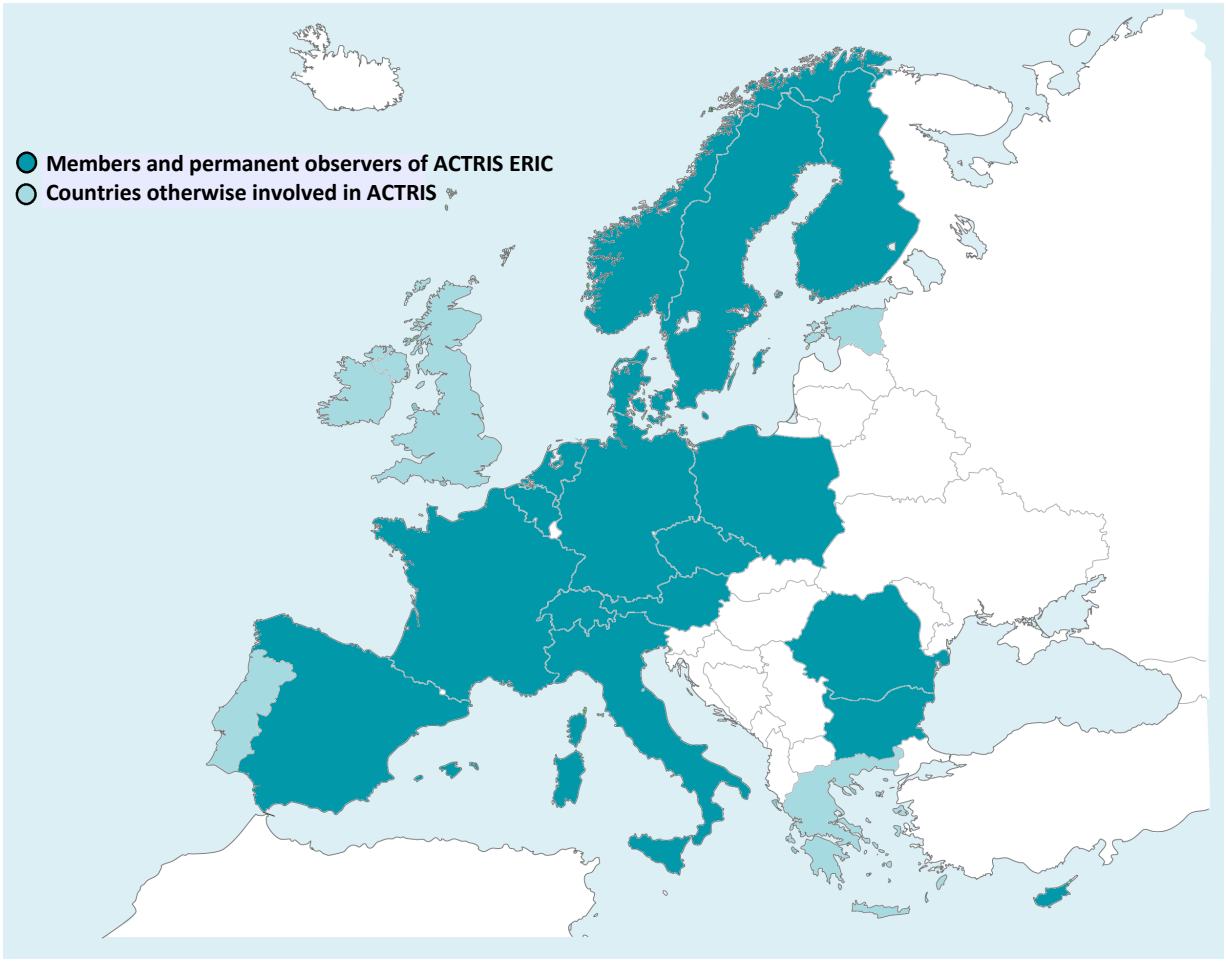






Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS) is a pan-European research infrastructure having the goal to produce high-quality integrated datasets in the field of atmospheric sciences. ACTRIS provides different services, including access to instrumented platforms, tailored for scientific and technological usage.

	In Situ	Remote Sensing
Aerosol		
Clouds		
Trace Gases		



ACTRIS ERIC established on 25th April 2023

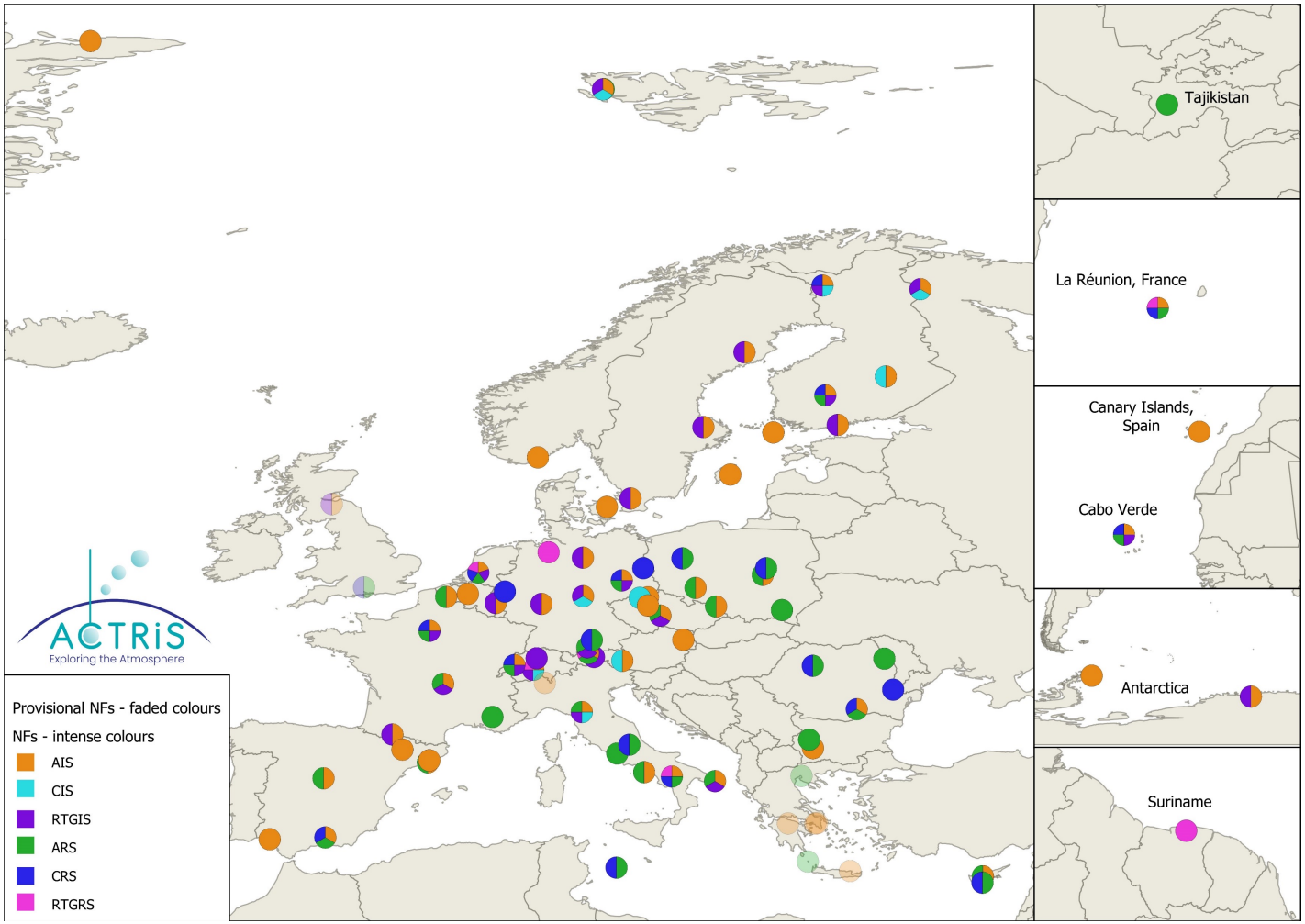
16 member countries: **Austria Belgium Bulgaria Czechia Cyprus Denmark Finland France Germany Italy Netherlands Norway Poland Romania Spain Sweden**

One permanent observer: **Switzerland**

Two in membership process: **Greece UK**

Three "bubbling under": **Estonia Ireland Portugal**

ACTRIS NATIONAL FACILITIES –THE BACKBONE OF THE RI



80 Observatory Platforms

are fixed ground-based stations delivering long-term high-quality data on aerosol, clouds and trace gases via remote-sensing and in situ measurement techniques.

ACTRIS NATIONAL FACILITIES –THE BACKBONE OF THE RI



>30 Exploratory Platforms

atmospheric simulation chambers, laboratory platforms and mobile platforms that perform dedicated experiments and campaigns

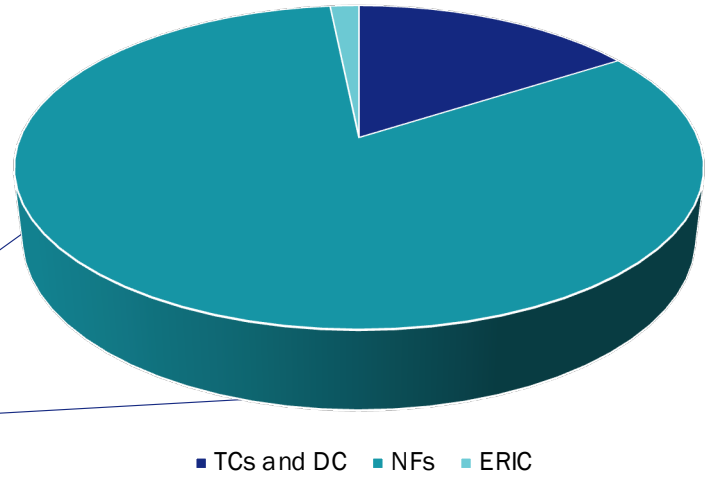
ACTRIS facilities constantly measure different optical and physical parameters of aerosol, clouds and trace gases, that address **natural hazards**, **climate change** and **air pollution**.

ACTRIS Financial Model

- ACTRIS is funded by the member and observer countries through membership contributions and host contributions to the Central Facilities, and national funding to the ACTRIS National Facilities
- EU project funding for research infrastructures supports the implementation and future development of ACTRIS

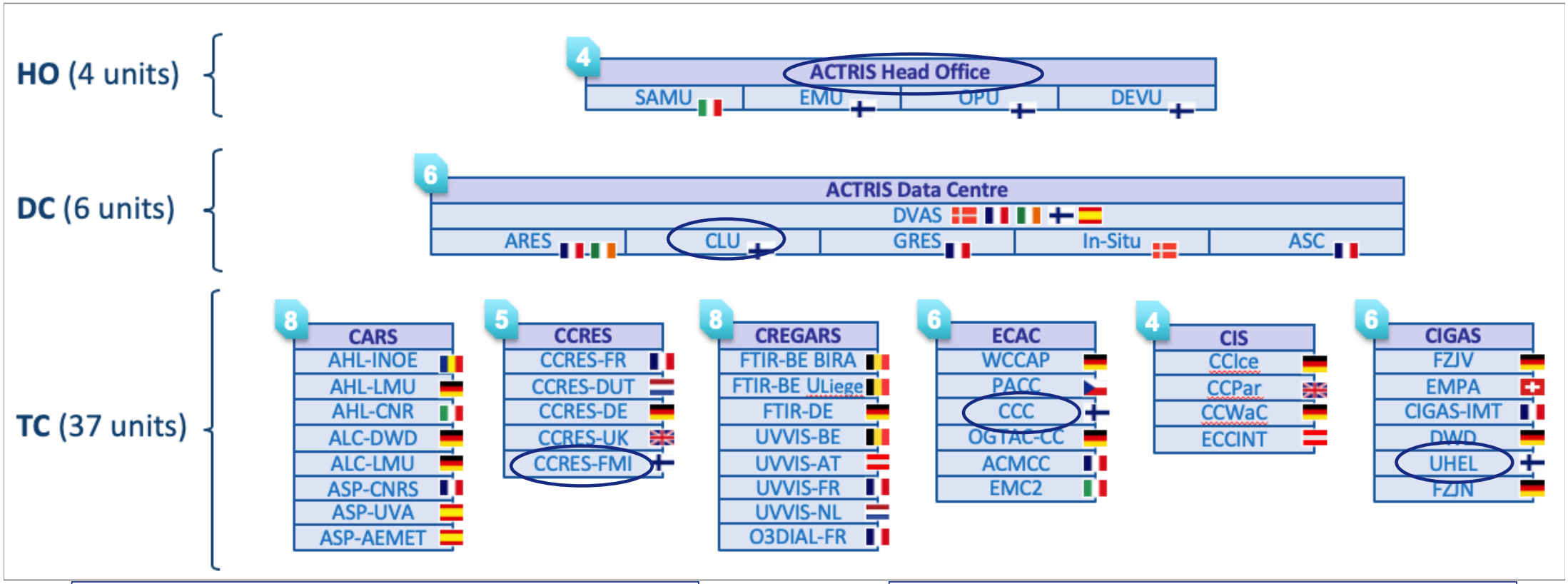
Total investment 700 M€
Design phase 85 M€
Preparatory phase 95 M€
Implementation 520 M€
Operation 95 M€ / year

Core budget in operational phase



ACTRIS ERIC:	1,5M€
Topical Centres and Data Centre, operated by more than 30 RPOs:	16,5M€
National Facilities in 17 countries:	77 M€

ACTRIS Head office, Data Center and Topical centers



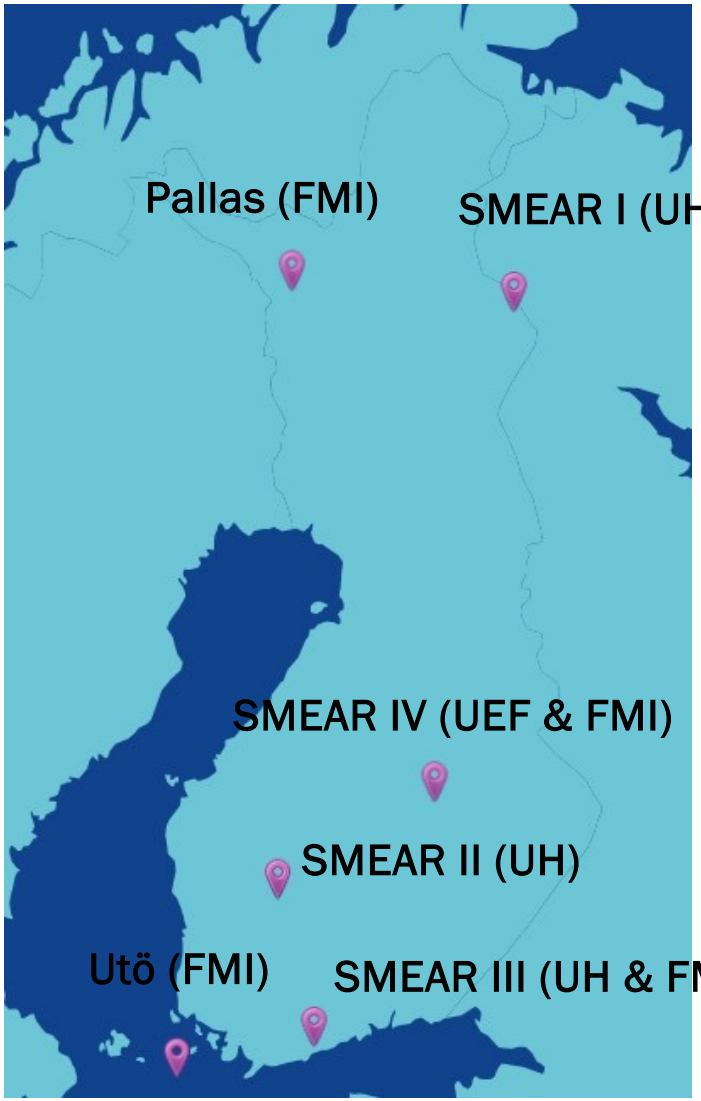
FMI Unit for cloudnet database

FMI Unit for doppler wind lidars

UH Unit for <10nm particle measurements

UH Unit for condensable vapours and direct aerosol precursor measurements

ACTRIS-Finland National Facilities



- **7 Observational platforms** (6 in Finland and 1 in Antarctic Peninsula)
- **7 Exploratory platforms** (5 Mobile platforms, 1 Simulation Chamber, 1 Laboratory)

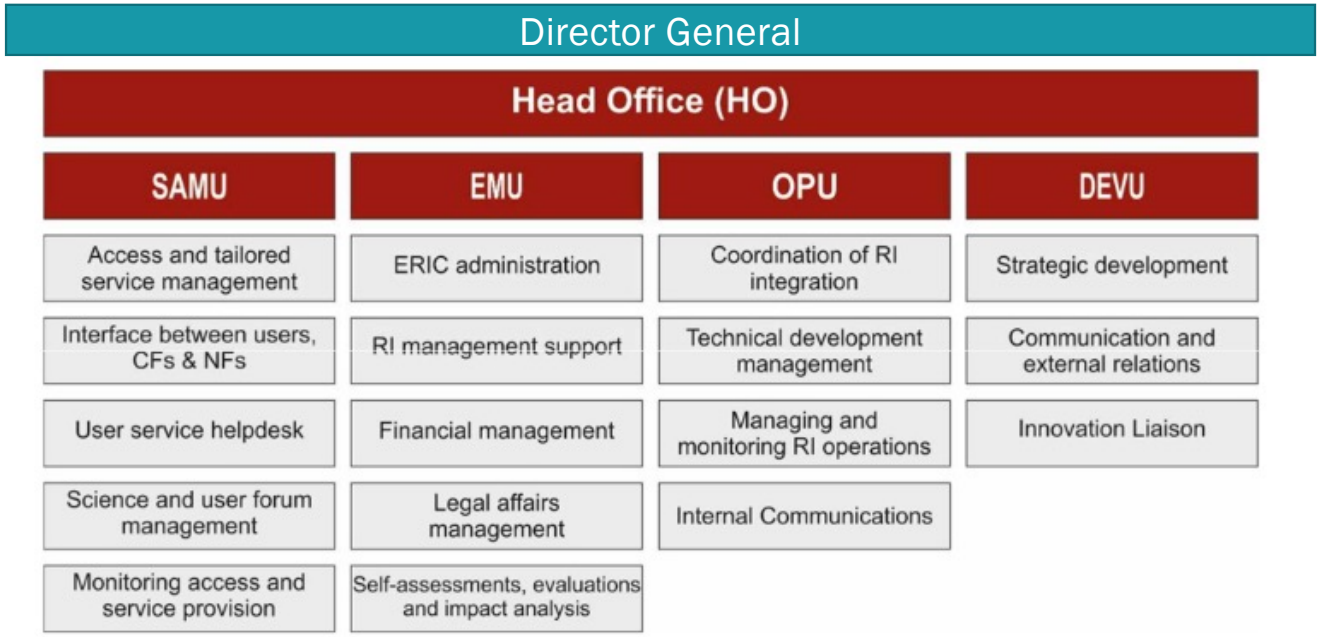
Name	Type	Components
Aerosol, cluster and trace gas laboratory (Helsinki)	Laboratory platform	2
FComLab - Doppler Cloud Radar	Mobile platform	1
FComLab - Doppler Lidar	Mobile platform	1
Kuopio Atmospheric Simulation Chambers (KASCs)	Atm. simulation chamber	1
Marambio	Observational platform	1
Mobile Aerosol Laboratory	Mobile platform	2
Multiwavelength Raman Lidar	Mobile platform	1
Pallas Atmosphere-Ecosystem Supersite	Observational platform	4
SMEAR II (Hyytiälä)	Observational platform	4
SMEAR III (Helsinki)	Observational platform	2
SMEAR I (Värriö)	Observational platform	3
SMEAR IV (Kuopio)	Observational platform	2
Unmanned Aerial vehicle (UAV)	Mobile platform	2
Utö Atmospheric and Marine Research Station	Observational platform	1

University of Helsinki, Tampere University, University of Eastern Finland and Finnish Meteorological Institute


ACTRiS
Exploring the Atmosphere
www.actris.eu

Additional information

ACTRIS ERIC Head Office



SAMU = Access and Service Management Unit -ITALY
EMU= ERIC Management Unit -FINLAND
OPU = Operation Unit -FINLAND
DEVU = Development and Relations Unit -FINLAND

ACTRIS ERIC Head Office

2024

- *Director General*– Eija Juurola
- *SAMU* – Carmela Cornacchia, Rosa Petracca, Giuseppe Gargano, Simone Gagliardi
- *EMU* – Anna Salonen, Terhi Kontkanen, Mikko Martikainen, Pirjo Kontkanen
- *OPU* – Niku Kivekäs, Misha Paramonov, Silja Häme, one position currently open
- *DEVU* – Giulia Saponaro, Ekaterina Zaitseva
- *Scientific Advisor*, call of expression of interest open

ACTRIS operational flow

Provision of data → Harmonized methods → Calibrated Instruments → Qualified data production → Curation of data → Access to users → Coordination

ACTRIS National Facilities

- Observation
- Experiment
- Access

ACTRIS Topical Centres

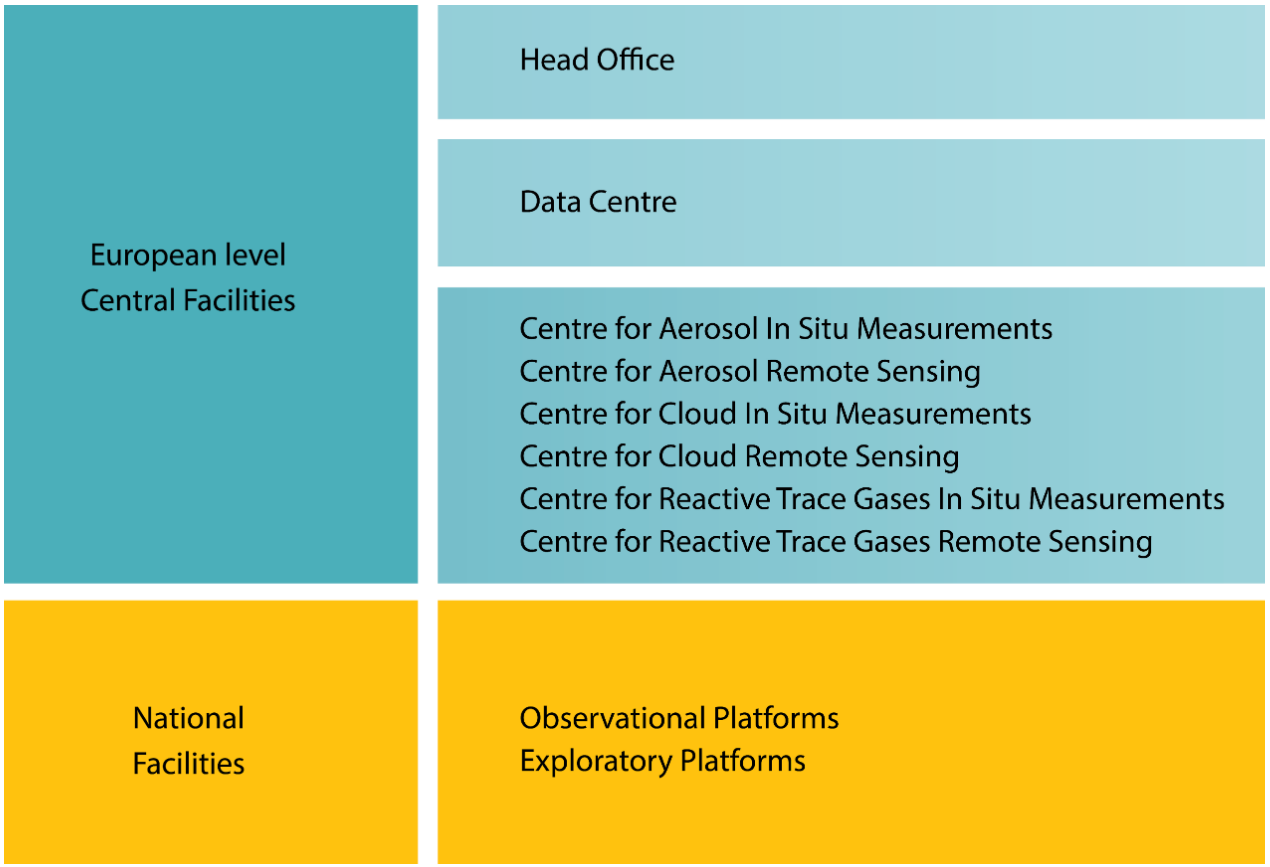
- Calibration
- SOPs
- Expertise
- Training
- Access
- Innovation

ACTRIS Data Centre

- >150 Variables delivered (incl. 5 GCOS ECVs and 10 ECV products)
- Virtual Services
- DOI
- Training
- Monitoring

ACTRIS Head Office

- Strategy
- Management
- Communication
- Access

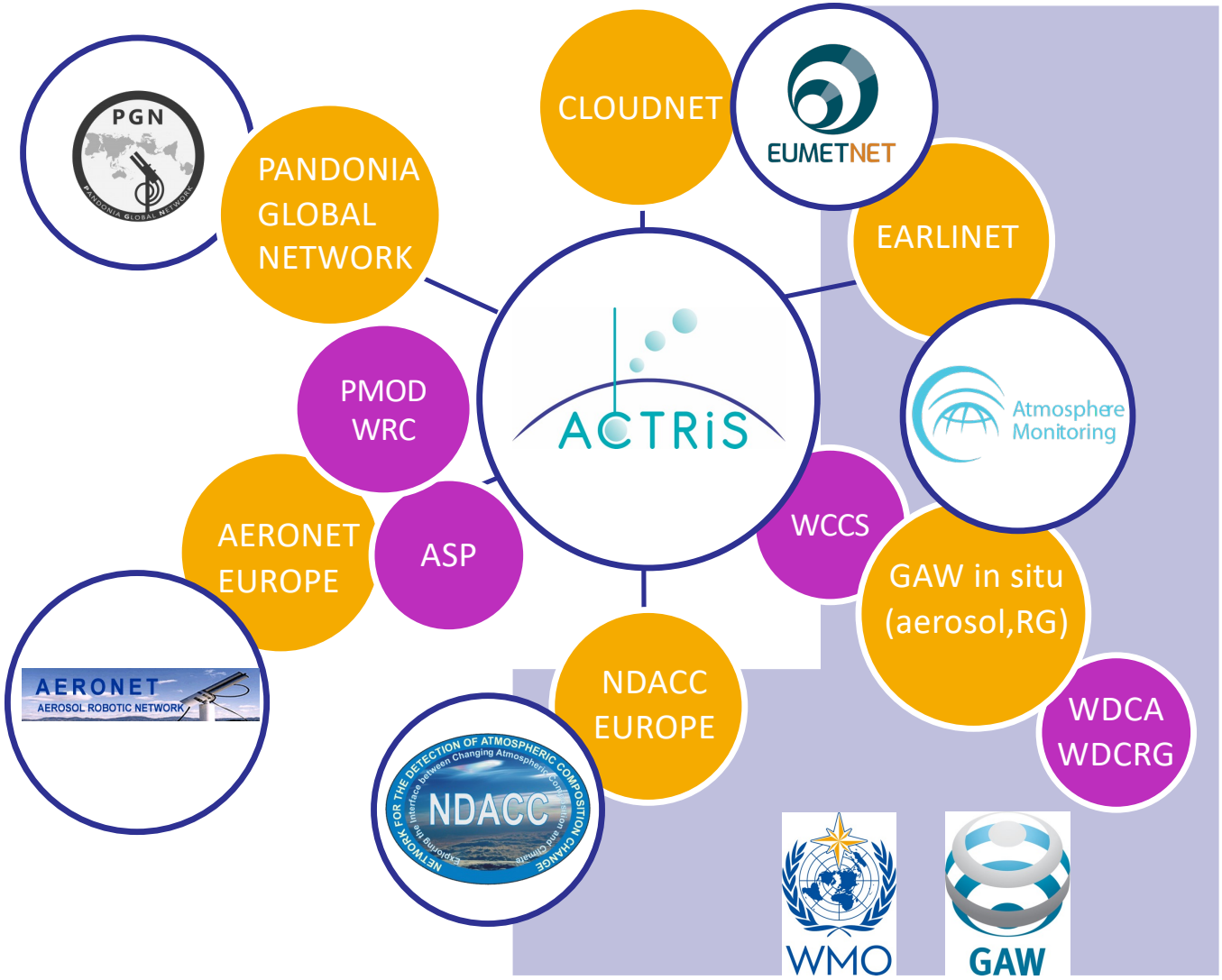

European level
Central Facilities
Head Office
Data Centre
Centre for Aerosol In Situ Measurements
Centre for Aerosol Remote Sensing
Centre for Cloud In Situ Measurements
Centre for Cloud Remote Sensing
Centre for Reactive Trace Gases In Situ Measurements
Centre for Reactive Trace Gases Remote Sensing
National
Facilities
Observational Platforms
Exploratory Platforms

ACTRIS variables -contribution to Global Observing System

• Particle size Spectrometers • Aerosol mass Spectometers • Nephelometers • Absorption Photometers • Condensation Particle Counters	AEROSOL 12 variables	CAIS-ECAC Centre for Aerosol In situ measurements	IN SITU
• Cloud Probes • Continuous flow diffusion Chambers • Cloud mixing and expansion Chambers • Inlets	CLOUDS 11 variables	CIS Centre for Cloud In situ measurements	IN SITU
• Volatile Organic Carbon (Gas Chromatography, PTR-MS) • Nox (Chemiluminescence)	TRACE GASES 6 variables	CiGas Centre for Reactive Trace Gases In situ measurements	IN SITU
• High Power aerosol Lidars • Automatic low-power Lidars and Ceilometers • Automatic sun/sky/lunar Photometers	AEROSOL 16 variables	CARS Centre for Aerosol Remote Sensing	REMOTE SENSING
• Cloud Radars • Doppler cloud Radar • Microwave Radiometers • Automatic low-power Lidars and Ceilometers	CLOUDS 25 variables	CCRES Centre for Cloud Remote Sensing	REMOTE SENSING
• Ozone DIAL (Differential Absorption Lidar) • FTIR (Fourier-transform infrared spectrometry) • UVVIS (Differential optiocal absorption spectrometry in the UV-Visivle range	TRACE GASES 10 variables	CREGARS Centre for Reactive Trace Gases Remote Sensing	REMOTE SENSING

- **5 GCOS ECVs (28 ECV products)**
  - → ECV Upper-air Water Vapour (**3**)
  - → ECV Cloud Properties (**7**)
  - → ECV Ozone (**6**)
  - → ECV Precursors (**5**)
  - → ECV Aerosol Properties (**7**)
- **15 GAW recommended measured variables**

ACTRIS within the international observing networks



- Operates **EARLINET / CLOUDNET**
- Supports Calibration Centers to **AERONET/ PGN / GAW / NDACC**
- Supports **World Data Centers and World Calibration Centers to GAW**
- Delivers to **AERONET, NDACC, PGN, and GAW**
- Delivers NRT to **E-Profile (EUMETNET)**
- **Deliver to CAMS with two ongoing contracts:**
  - **CAMS_21a for the provision of surface in-situ aerosol data**
  - **CAMS-21b for the provision of profile aerosol data**

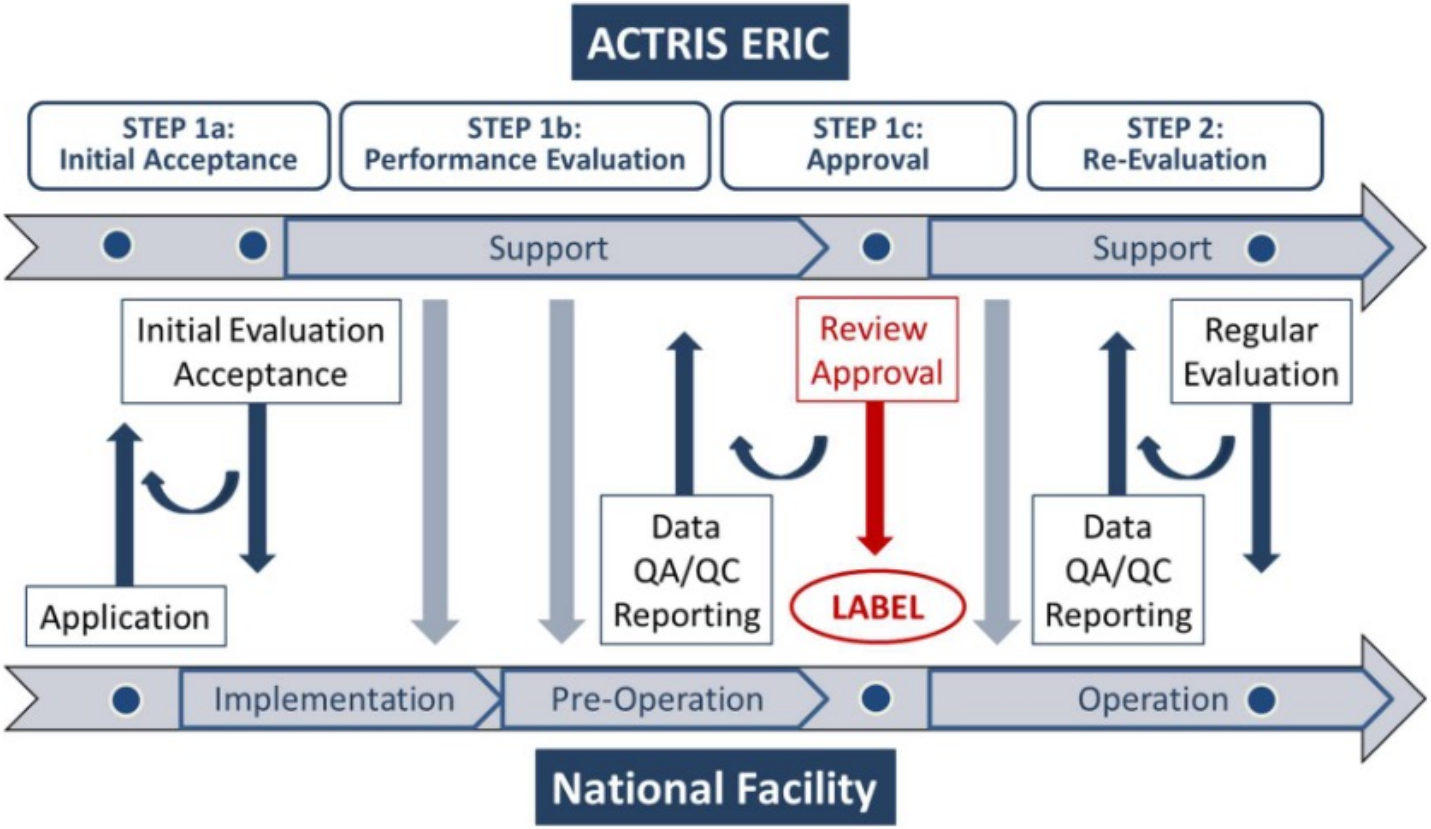
ACTRIS Services

TECHNICAL SUPPORT

- Provided by 6 Topical Centres
- Standard operation procedures developed for all ACTRIS techniques and variables
- Standards for harmonised measurement and data processing protocols
- Harmonised retrieval methods for geophysical products
- Certification of National Facility measurements by providing an ACTRIS label after a thorough evaluation process



National Facilities labelling process



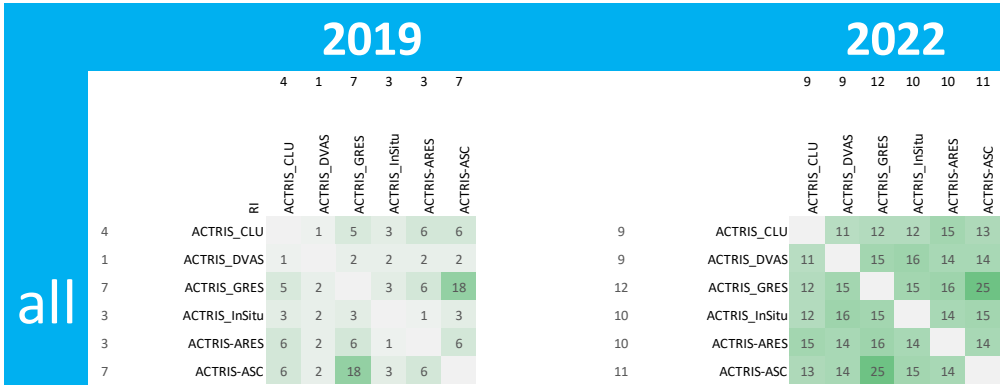
ACTRIS Services & Resources

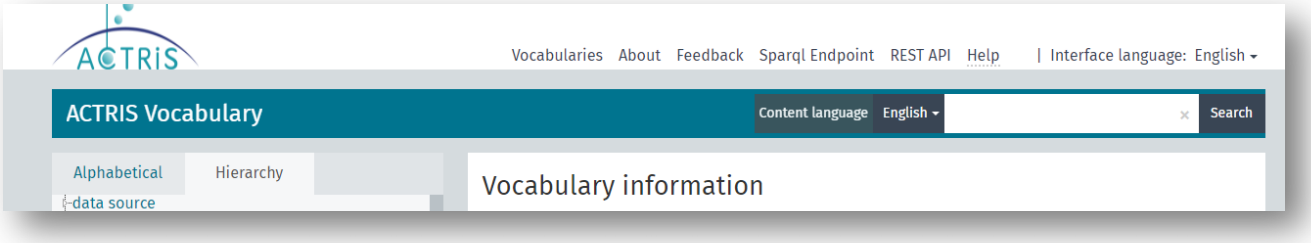
DATA PROVISION

Development of the Data Centre as the single entry-point has required huge joint effort from different parts of ACTRIS

- Standardization
- Harmonization of the measurements
- Development QA/QC processes
- Software development
- Shared vocabulary

actris.nilu.n

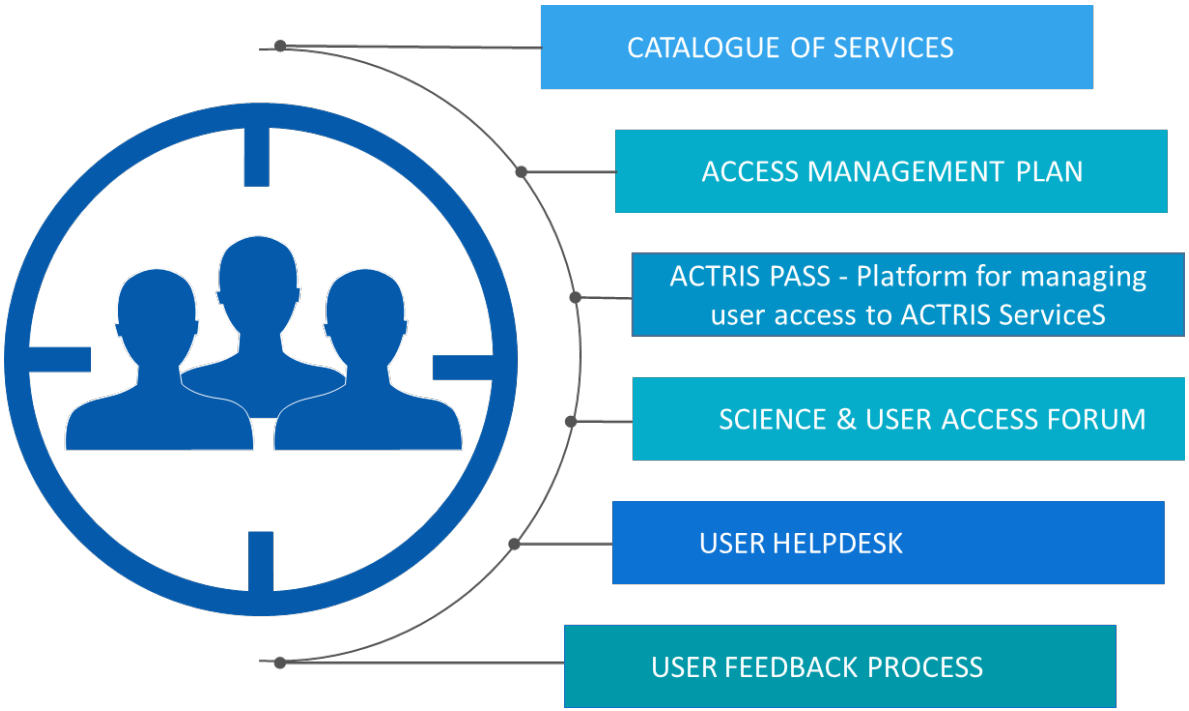




ACTRIS Services

ACCESS TO FACILITIES

ACTRIS services and support system



SAMU numbers (2022-2023)

- ✓ 5 Units of staff
- ✓ 10 TNA Calls managed
- ✓ 324 applications processed
- ✓ 209 Accepted → 595 users
- ✓ ~ 600 requests for support (users, providers, reviewers)
- ✓ 231 providers & reviewers