ACTRIS | Exploring the Atmosphere

ACTRIS HIGHLIGHTS 2024

ACTRIS
HIGHLIGHTS
2024

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The Aerosol, Clouds and Trace Gases Research Infrastructure
ACTRIS Highlights 2024, Helsinki, November 2025

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The Aerosol, Clouds and Trace Gases Research Infrastructure
ACTRIS Highlights 2024, Helsinki, November 2025

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Forewords

2024 marks an important milestone for ACTRIS. It was our first full year as a European Research Infrastructure Consortium, and I am pleased to introduce the inaugural edition of the ACTRIS Highlights with great pride. This new annual publication reflects our commitment to transparency, shared ambition, and celebrating the accomplishments of our community.

This year was exceptional for ACTRIS in many ways. We strengthened the foundations of our operations, advanced the scientific and technological excellence that defines us, and expanded our role in Europe and beyond. From the launch of the new ACTRIS Data Portal to the successful delivery of access services, major international research campaigns, and the first ACTRIS Science Conference, 2024 demonstrated how far ACTRIS has come and how much potential lies ahead.

Personally, 2024 was a significant year. I was honoured to be elected as the first Director General of ACTRIS ERIC, following my time as Interim Director General. I am grateful for the trust placed in me and deeply inspired by the dedication of everyone contributing to ACTRIS: scientists, engineers, technical experts, facility operators, host organisations, and the many partners who work with us across Europe and around the world.

The achievements highlighted in this report are the result of collective effort. They show not only the strength of our scientific capabilities but also the power of collaboration and shared purpose across our Member Countries, Central Facilities, National Facilities, and partners. Together, we operate a research infrastructure that delivers high-quality observations, fosters innovation, and provides essential knowledge to support science, society, and environmental policy.

As we look forward, ACTRIS will continue to develop the services, technologies, and community that enable excellent atmospheric research. I warmly thank everyone who contributed to the successes of 2024, and I invite you to discover in these pages the momentum, expertise, and commitment that make ACTRIS a cornerstone of Earth science.

Together, we advance ACTRIS. Together, we advance atmospheric science.

Eija Juurola

ACTRIS ERIC
Director General

About ACTRIS

Exploring the Atmosphere

The Aerosol, Clouds, and Trace Gases Research Infrastructure (ACTRIS) is the pan-European research infrastructure dedicated to the observation and understanding of short-lived atmospheric constituents and their interactions.

ACTRIS provides open access to high-quality data, state-of-the-art facilities, and tailored services provided by its Central Facilities and National Facilities, supporting cutting-edge atmospheric and climate research.

Our Strategy

Our Values Guide Us

User Focus

We strive for a deep understanding of our user's needs and aim at meeting them in everything we do

Innovation and renewal

We foster bencharmarking innovation and embrace change through continuous learning and development.

Teamwork and passion

We are stronger together. Collaboration with each other and our stakeholders is at the heart of what we do.

Integrity

Our integrity and reliability must be unquestionable. We promote sustainable and ethical behaviour.

Our Success is built on

Reliability | **Expertise** | **Science-based technological leadership** | **Engaged & talented people** | **Partnerships & Collaborations** | **Strong financial commitment of Members** | **Sustainability**

We drive excellence & scientific advances in the field of atmospheric research

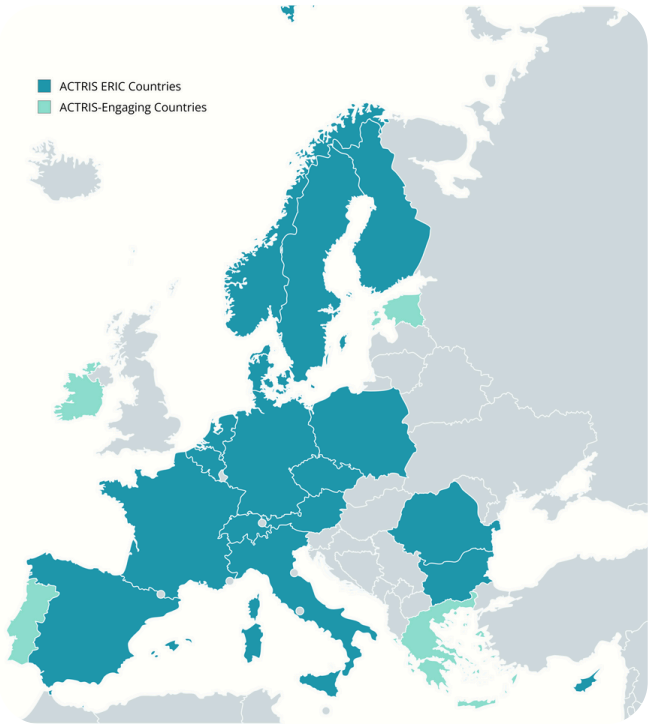
Deeper understanding

Scientific progresses based on high quality observations and user-focused services

Innovation development

Technological advancements through partnerships and tailored services.

Our Member Countries



ACTRIS Member Countries

- Austria
- Belgium
- Bulgaria
- Cyprus
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Italy
- The Netherlands
- Norway
- Poland
- Romania
- Spain
- Sweden
- Switzerland

ACTRIS Engaging Countries

- Estonia
- Greece
- Ireland
- Portugal

Our Catalogue of Services

147	Total services	**98**	Research Services
88	Technological Services	**59**	Training Services
53	Data and Digital Services	**51**	Innovation Services

Our 2024 in numbers

185	Access requests to ACTRIS Facilities	**211**	Users to ACTRIS Facilities
323,403	Data files available	**27**	Projects

Our Users

By application of ACTRIS products:

- Climate modelling
- Atmospheric environment modelling and forecast
- Ecological research and monitoring
- Health studies and epidemiology
- Energy (solar energy)
- Academic research
- Meteorological agencies
- Environmental ministries and agencies at national and regional levels
- Natural resources ministries and agencies at national and regional levels
- Health agencies
- Industrial users, including companies of a large span of sizes and activities

By activity domain:

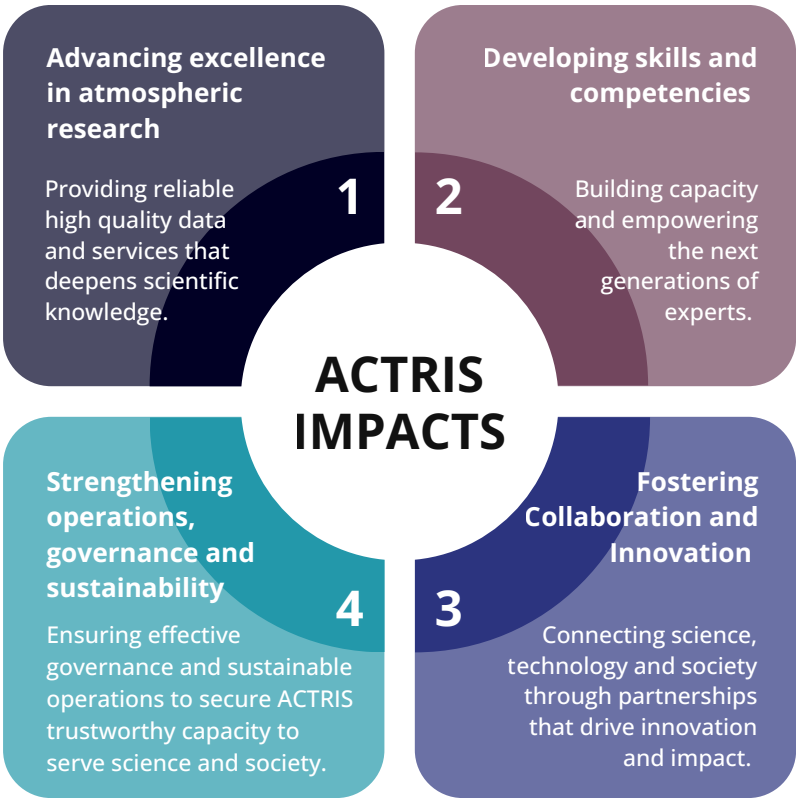
- Academic research
- Meteorological agencies
- Governmental agencies, Environmental ministries and agencies at national and regional levels
- Transport agencies
- Hydrological institutes and agencies
- Natural resources ministries and agencies at national and regional levels
- Health agencies
- Industrial users, including companies of a large span of sizes and activities

From Objectives to Impacts

The objectives of ACTRIS, as defined in its Statutes, are to:

- Advance scientific excellence and technological innovation in atmospheric research by providing high-quality, integrated data on aerosols, clouds, and trace gases, thereby contributing to the completeness of the Earth observation system and improving climate and Earth system models
- Ensure the coordinated operation and sustainable development of a distributed research infrastructure that integrates National and Central Facilities, offering open and reliable access to data, services, and research platforms for a broad community of users.
- Promote the effective use of ACTRIS data and services across scientific, environmental, and policy domains.
- Foster collaboration and knowledge exchange between research, education, and innovation by engaging with academia, industry, and other stakeholders, and by supporting training and capacity-building initiatives.
- Strengthen synergies and interoperability with other research infrastructures and initiatives at European and global levels, ensuring coherence with national and European strategies and maximizing ACTRIS's contribution to science, society, and technology.

Together, these pillars turn ACTRIS objectives into tangible impacts for science, and society.



1

Advancing Excellence in Atmospheric Research

Providing reliable high-quality data and services that deepen scientific knowledge

112 Research Performing Organizations

17 Countries

89M€ Financial Volume

250+ Publications reported

27 Projects

Exploring the Atmosphere through the ACTRIS Data Portal

A New Gateway to Atmospheric Knowledge

ACTRIS reached a major milestone in 2024 with the launch of its new ACTRIS Data Portal, a next-generation access point to atmospheric research data.
The portal opens the door to over 200,000 FAIR data files, covering 150 atmospheric variables from over 600 facilities worldwide, with records that in some cases span several decades.
Users can now explore, visualize, and download data on aerosols, clouds, and trace gases - essential information for understanding air quality, climate, and atmospheric composition.

"The new portal represents a transformative step for ACTRIS, enabling open, efficient, and collaborative use of atmospheric data across borders."
Cathrine Lund Myhre,
ACTRIS Data Centre Leader

Open access to ACTRIS data and Digital services

The new ACTRIS Data Portal was released in September 2024 for all users along with other data products, tools, services, and complementary data from other frameworks, services, and digital tools.

In the period 01 September 2024-31 December 2024, the portal recorded approximately 2,297 visitors from 67 countries. The USA, Norway, Italy, Germany, and France were the countries with the highest number of visits to the ACTRIS Data Portal.

The ACTRIS Virtual Research Environment (VRE)

Complementing the portal, the ACTRIS VRE provides researchers with a cloud-based workspace to access, analyze, and integrate atmospheric data efficiently.
Powered by JupyterHub, the VRE offers ready-to-use Python tools and workflows that simplify analysis and promote data reuse.

Key features:

- Intuitive tools for search, visualization, and trend analysis
- Integration of datasets such as equivalent black carbon, FLEXPART model outputs, and ultrafine particles
- Efficient access to large-scale data volumes and collaborative analysis tools

Collaborative Innovation at European Scale

This achievement is the result of a truly collaborative effort. More than 30 experts, scientists, developers, and engineers, from 8 European research organizations (NILU, CNR, CNRS, FMI, BSC, IPSL, ULille, UPEC, UT) in Norway, France, Italy, Finland, and Spain worked together to make the portal a reality.

The initiative enhances Europe's capacity for open data exchange, fostering innovation in:

- Air quality monitoring
- Climate research
- Environmental policy and industry applications

Powering Research at ACTRIS Facilities

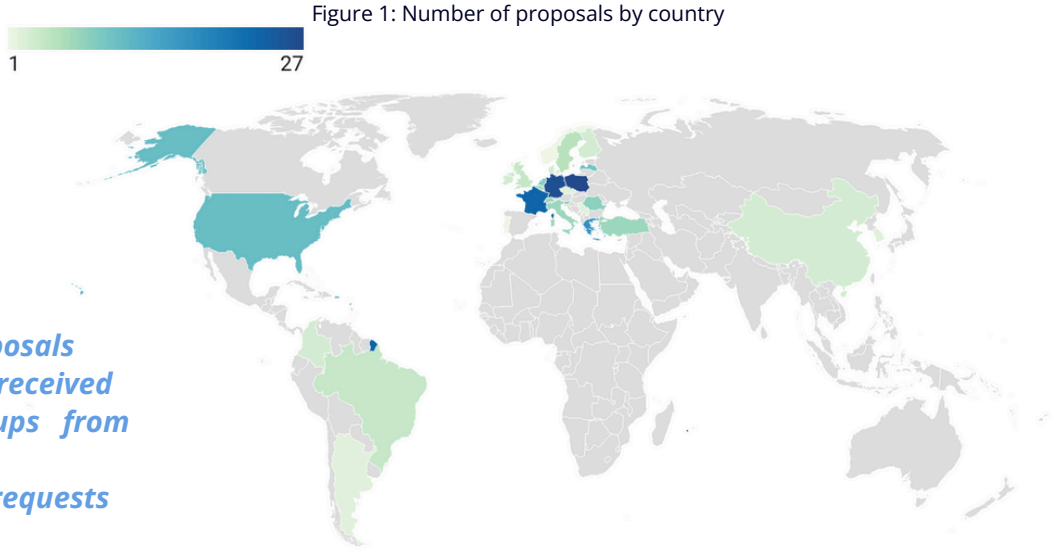
The main aim of ACTRIS is to enable excellent science, both as a service to international users and as an in-house activity. This is achieved mainly by providing merit-based open access to its research facilities and promoting internal research.

In 2024, ACTRIS launched 6 calls for proposals, launched within the framework of EU-FUNDED project ATMO-ACCESS and ITINERIS, to use the Consortium's facilities: 185 proposals were received and 149 were accepted. The 2024 accepted project proposals came from 27 countries, of which 44% are ACTRIS ERIC Member Countries, and 40% are non-EU countries (Figure 1).

Main achievement in 2024

- Achievement of 6 access calls in the framework of the EU-funded projects ATMO-ACCESS and ITINERIS
- Access request proposals received from 27 countries, including non-EU countries
- 56 access user events across 31 ACTRIS facilities distributed in 14 European countries were successfully granted to 211 users for their own project development

Figure 1: Number of proposals by country



6 calls for proposals
337 proposals received
Research groups from 37 countries
257 allocated requests

Observational Platforms accounted for the majority of activities, confirming their central role in providing continuous and high-value atmospheric measurements. Atmospheric simulation chambers and Central Facility Units also supported a substantial number of projects, while mobile platforms enabled collaborative and campaign-based research. Geographically, access was distributed across 14 European countries, with strong participation from Germany, France, Finland, Poland, and Italy, demonstrating ACTRIS's broad pan-European reach and its capacity to provide diverse, high-quality services to the research and innovation community.

A pilot call was launched in 2024 to test an access funding scheme based on national funds, using the Italian-funded project ITINERIS as a test case.

The activities carried out within this framework built upon several well-established functions of the ACTRIS ERIC Service and Access Management Unit (SAMU), while also requiring significant efforts to design and implement new processes tailored to this funding model.
To accommodate the specificities of a national co-funded access programme, several complementary activities were introduced. These included the development of measures to ensure compliance with GDPR regulations, the creation of a Service Level Agreement (SLA) template to be signed by each participating provider, and the establishment of internal operational and financial procedures and templates at the ACTRIS ERIC Head Office for managing the programme.

Scientific Highlights

ACTRIS BAMS Paper Reaches Over 20,000 Views

The Bulletin of the American Meteorological Society (BAMS) published a comprehensive reference paper on ACTRIS, highlighting its mission, added value to atmospheric science, and broad range of services for academia, and the public and private sectors.

The paper outlines ACTRIS governance, major scientific achievements, and future directions. Since publication, it has reached over 20,000 views and 4,000 downloads, underscoring ACTRIS's strong visibility and recognition in the atmospheric research community.

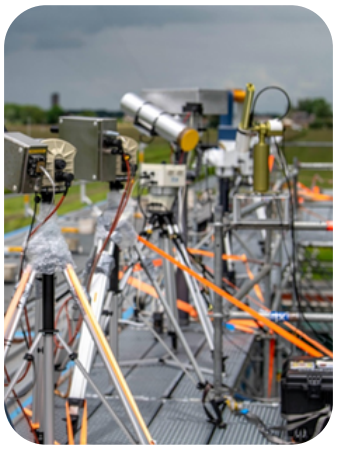
CREGARS

CINDI-3: a campaign advancing our understanding of air pollution

In June 2024, the third Cabauw Intercomparison of UV-Vis DOAS Instruments (CINDI-3) took place in Cabauw Atmospheric Research Station, the Netherlands.

The campaign brought together over 100 participants from 16 countries operating 44 instruments, making it the largest ground-based air pollution intercomparison of its kind.

The campaign provided high-quality reference data under challenging weather conditions, supporting the validation of current and future satellite missions, including Sentinel-4 and Sentinel-5, as part of ESA's Fiducial Reference Measurements (FRM) Programme.



CiGas

Intercomparison campaign of chemical ionization mass spectrometry

In summer 2024, the University of Helsinki hosted the second ACTRIS intercomparison campaign of chemical ionization mass spectrometers at the Finnish ACTRIS National Facility SMEAR II in Hyytiälä.

Six instruments and their users participated in the two-week campaign, which compared measurements of a wide range of inorganic and organic vapours under summertime conditions.

The campaign represents an important step towards future QA/QC measures for ACTRIS National Facilities and ensures reliability and comparability of data on condensable vapours and direct aerosol precursors across the ACTRIS community.

Scientific Highlights

CCRES

CLOUDLAB: Exploring Ice Formation in Supercooled Clouds

The TROPOS mobile exploratory platform LACROS took part in a three-month winter field campaign near Eriswil, Switzerland.

Conducted under the ERC CLOUDLAB project led by ETH Zürich and within the DFG-funded PolarCAP framework, the campaign brought together an exceptional suite of ground-based and airborne sensors, representing one of Europe's largest coordinated operations of multiwavelength radar and lidar systems.

LACROS contributed 35 GHz scanning and 94 GHz vertical-pointing cloud radars, complementing instruments from ETH Zürich, the University of Leipzig, and EPFL. By investigating slightly supercooled cloud systems (down to −10 °C), the campaign advanced understanding of ice formation and cloud–aerosol interactions.

Image Credit: Jan Henneberger

CiGas

EUROVOC 2024: Investigating Volatile Organic Compound (VOC) Emissions and Their Impact on Air Quality

In September 2024, ACTRIS co-organized EUROVOC, the second pan-European intensive measurement period on VOCs, engaging 45 urban and rural sites across Europe, including ACTRIS National Facilities, ICOS, EMEP, and local monitoring networks. This large-scale campaign strengthens Europe-wide understanding of VOC emissions and their impacts.

Key progress was also made in quality assurance: ACTRIS CiGas-FZN revised its mobile calibration equipment and introduced a fixed test cycle for NOx audits to better characterize humidity and ozone interferences, while CiGas-CH advanced near-real time delivery of VOC data with automatic quality checks.

As a pilot, VOC data from the Jungfraujoch site are now directly submitted to the Copernicus Atmosphere Monitoring Service (CAMS), showcasing ACTRIS's role in bridging research infrastructures and operational services.

ACTRIS Romania inaugurates the ACTRIS-UBB Observation Platform

On 21 October 2024, Babeș-Bolyai University (UBB) officially inaugurated the ACTRIS-UBB Platform, marking a significant advancement in Europe's atmospheric observation network and Romania's contribution to ACTRIS. The new facility plays a crucial role in bridging ground-based atmospheric monitoring with the European Space Agency's Earth observation initiatives.

Designed to deliver high-quality observations relevant for atmospheric composition and climate studies, it is integrated with the ground-based observing segment of ESA's Earth observation programme, thereby contributing to the calibration, validation, and synergy of satellite and in-situ datasets. Through standardized protocols and instrument interoperability, ACTRIS-UBB ensures that data produced are consistent with ACTRIS's quality and service standards.

As part of ACTRIS, the facility fosters collaboration, training, and data exchange within the European and global atmospheric science community.

Scientific Highlights

CAIS-ECAC

Understanding the Impacts of Domestic Biomass Burning

Within the ATMO-ACCESS framework, the project "MIND-BB", researchers from ENEA and University of Milano-Bicocca collaborated at EUPHORE, a highly instrumented ACTRIS exploratory platform in Valencia, Spain.

The campaign investigated emissions from different domestic heating devices and wood types, monitoring their physical and chemical transformations under day and night conditions.

The study also assessed direct impacts on human lung cells using the air-liquid interface exposure system. This multidisciplinary approach provides valuable insights into the environmental and health hazards of domestic biomass burning, supporting improved emission inventories in EU, refined air quality and atmospheric models, enhanced understanding of toxicological risks, and evidence-based strategies for mitigation and policy development.

ASC

SAPHURBAN: Investigating Secondary Organic Aerosol Formation in Urban Environments

The ATMO-ACCESS transnational access project "SAPHURBAN", led by the University of Eastern Finland, addressed this challenge using advanced chemical ionization mass spectrometry in controlled experiments at the SAPHIR simulation chamber at Forschungszentrum Jülich.

The outcomes provide novel insights into SOA formation pathways, quantifying the impact of VCPs, cooking, and traffic emissions on urban air quality. These results will enhance chemical transport models, improving predictions of urban SOA formation, and support evidence-based strategies for air quality management.

CCRES

Cloud Calibration Transfer Campaign at the JOYCE Observatory

From December 2023 to February 2024, the CCRES-France reference cloud radar (94 GHz BASTA) was deployed at the JOYCE observatory in Jülich, Germany, alongside the local MIRA radar, to test the calibration transfer service.

The campaign demonstrated a negligible mean bias (0.2 dB) between radars, validating the reliability of the reference calibration and informing procedures for re-calibrating CloudNET products.

Key insights on methodology, resources, and best practices were shared at the CCRES workshop in June 2024, supporting the development of calibration transfer as a service for ACTRIS National Facilities.

2

Developing Skills and Competences

Building capacity and empowering the next generations of experts

2000+
Researchers

1016
Personnel at ACTRIS Facilities

46
MSc Degrees

44
PhD Degrees

10
International education & training events

Learning Pathways in Atmospheric Sciences

AGORA International Doctoral Summer School

This second edition was organized in the framework of the Doctoral School of Sciences, Technologies and Engineering of the University of Granada.

The lectures, given by top-level experts from the ACTRIS facilities for aerosol in-situ and remote sensing measurements, provide fundamental knowledge in novel, advanced techniques for measuring aerosol properties, covering in situ, remote sensing, and laboratory-based instruments.

The training school is intended mainly for researchers and technicians from the atmospheric field (advanced master students, doctoral students, early-career scientists, or technicians).

HErZ 2024 Summer School: Modern Methods for Atmospheric Profiling

In August 2024, 48 international students and early-career researchers participated in a two-week summer school on atmospheric profiling at the Jülich Observatory for Cloud Evolution (JOYCE), an ACTRIS National Facility.

Participants gained practical experience with state-of-the-art observation techniques, including lidar, microwave radiometers, UAS (drones), and radiosondes, while working in small groups on research projects linked to the VITAL I campaign.

This campaign focused on improving observations of the vertical structure of the troposphere to address key gaps in wind, water vapor, and temperature profiling.

OGTAC-CC Training Course

From 11 to 15 November 2024, the OrGanic Tracers and Aerosol Constituents Calibration Centre (OGTAC-CC), a unit of the ACTRIS Centre for Aerosol in Situ measurements, hosted a five-day hands-on training at TROPOS ACD, Leipzig.

The course trained participants from across Europe in LC-MS analysis of organic tracer compounds and organic/elemental carbon (OC/EC) determination in particulate matter.

The program combined lectures in atmospheric and analytical chemistry with practical sessions, including experiments in the TROPOS atmospheric simulation chamber, visits to the Melpitz field station, and hands-on work with state-of-the-art analytical instrumentation.

By integrating theory and practice, the course enhanced skills, collaboration, and capacity across the European atmospheric research community, supporting high-quality, harmonized aerosol measurements and future joint research.

Learning Pathways in Atmospheric Sciences

ATMO-ACCESS Autumn Schools on Sensors and Drones

ACTRIS partners EMPA (Switzerland) and CARE-C, Cyprus Institute, jointly organized two parallel hybrid ATMO-ACCESS Training Schools to equip emerging atmospheric scientists with hands-on expertise in sensor operation and data analysis.

The EMPA-hosted school near Zurich focused on ground-based sensor systems in urban and remote settings, while the CARE-C school in Nicosia offered practical training on drone-based atmospheric measurements.

Aimed at M.Sc. and Ph.D. students, the courses combined in-person and hybrid learning formats, fostering exchange between participants and experts from both sites.

More than 20 participants from 17 different countries including non-EU countries such as Lebanon, India, Pakistan, Turkey, Nigeria and Brazil attended the trainings. Some students were supported by ATMO-ACCESS TNA programme.

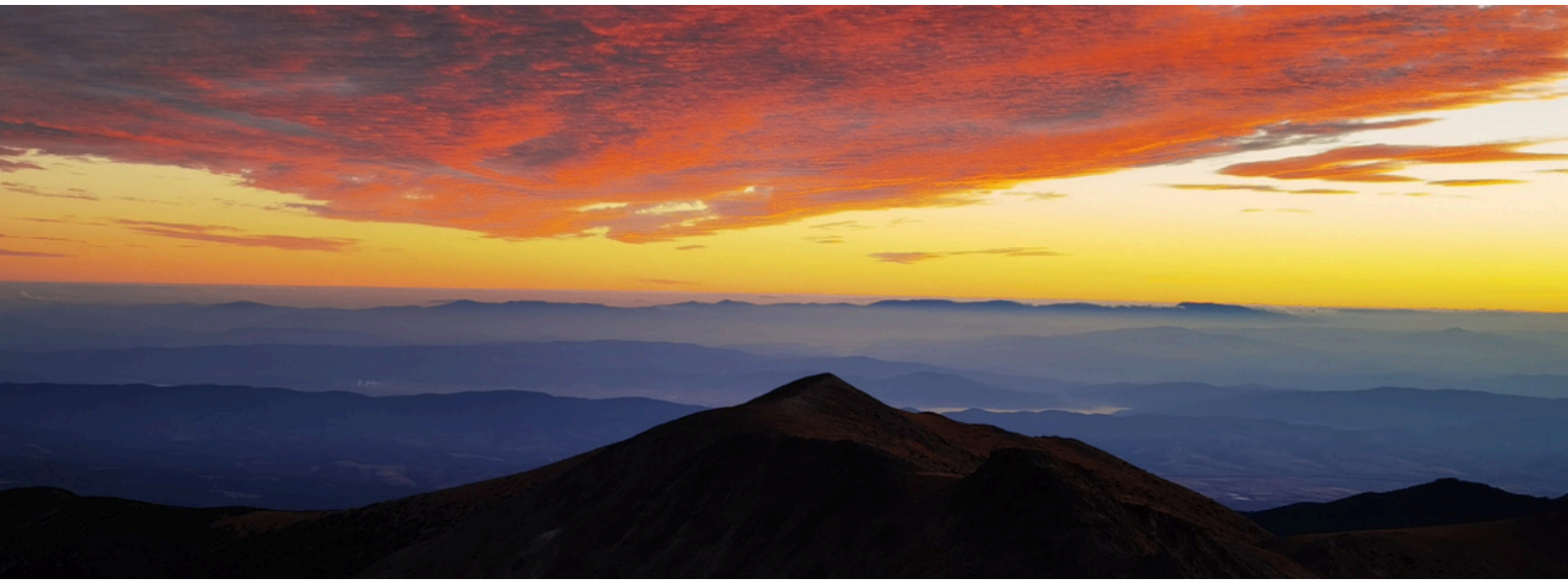
Training public authorities on novel air quality measurements

In October 2024, ACTRIS contributed to the H2020 projects ATMO-ACCESS and RI-URBANS by organizing two online training sessions for public authorities on the implementation of protocols for measuring novel air quality parameters under the revised EU Ambient Air Quality Directive.

The first webinar focused on ultrafine particles (UFP) and particle number size distribution (PNSD), while the second addressed measurements of volatile organic compounds (VOCs), particulate matter (PM), and black carbon (BC).

Each session featured expert speakers from the European atmospheric science community, offering both scientific insights and practical guidance on the deployment of these advanced measurement echniques.

These trainings strengthened technical capacity among environmental authorities and fostered consistency and high-quality standards in air quality monitoring across Europe, supporting the effective implementation of the updated regulatory framework.



Professional trainings and technical workshops

CAIS-ECAC

Aerosol Chemical Monitor Calibration Centre Interlaboratory Comparison

In November 2024, the Aerosol Chemical Monitor Calibration Centre (ACMCC) at ACTRIS France hosted its annual interlaboratory comparison, spanning the full month from instrument installation to post-comparison assessments under ambient air conditions.

The event included full calibrations of all participating instruments and hands-on workshops for participants, covering data processing, operational procedures, and best practices. These activities strengthen the accuracy, consistency, and reliability of aerosol measurements across ACTRIS National Facilities.

For the first time, Aerospec participated to evaluate their new instrument, F AIR, capable of measuring the chemical composition of fine particles, including the molecular components of the organic fraction. Long-standing partners, Aerodyne Research and Addair, provided crucial support.
The intercomparison fostered knowledge, collaboration, and innovation.

CARS, DC

Strengthening the Lidar Community

From 9 to 12 December 2024, the annual Lidar QA/QC Workshop brought together representatives from 27 stations in a productive and collaborative online event. Hosted by experts from CARS and Aerosol Remote Sensing Data Centre Unit, the workshop expanded its focus to include both quality assurance testing and data processing, providing a comprehensive platform for knowledge exchange.

Each station participated in a dedicated 30-minute session to review QA reports, discuss measurement procedures, and address technical challenges with guidance from CARS and ARES experts. For new stations, these sessions also facilitated introductions to the broader network. Updates on labelling processes ensured clarity, alignment, and consistency across all stations.

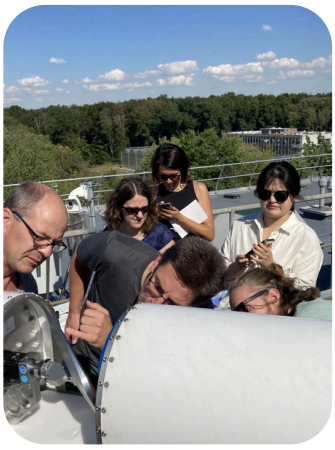
Beyond technical discussions, the workshop reinforced the community of lidar professionals, fostering collaboration, sharing best practices, and promoting innovation and excellence in QA/QC procedures across the network.

CCRES

Microwave Radiometer Training Workshop

From 24–26 April 2024, a Microwave Radiometer (MWR) training workshop was held in Jülich, Germany, providing participants with theoretical and practical knowledge on MWR operation, data processing, and software use. Hands-on sessions included radome replacement, calibration, and discussions with the manufacturer (RPG).

The workshop gathered 9 participants from 7 countries, including 6 from ACTRIS National Facilities (Cabauw/Delft, Chilbolton, Warsaw, Cluj, Payerne, Bucharest), strengthening technical expertise and capacity across the ACTRIS community.



Professional trainings and technical workshops

CiGas

Strengthening NOx/VOC Data Quality Across ACTRIS

In April 2024, ACTRIS held its annual NOx/VOC Quality Assurance Workshop, bringing together experts to review data submissions to the EBAS database. The three-day online workshop featured station reports, scientific presentations, and discussions on future activities, ensuring continued harmonization and high-quality data within the ACTRIS community.

Establishing strong connections with associated communities such as WMO-GAW (WCC-NOx), TOAR-II, and National Metrology Institutes (NMIs) is a key focus. Training and consultancy efforts include providing expert advice on NOx measurements and organizing CiGas training programs, such as those within GAWTEC.

ASC

First ACTRIS ASCC Workshop

The first ACTRIS Atmospheric Simulation Chamber Community (ASCC) Workshop was successfully held at the University of Wuppertal from 18 to 29 March 2024 and brought together 36 participants from 9 countries.

Throughout the meeting, participants delivered short scientific and technical presentations showcasing the latest research results, methodological advances, and technological developments achieved at atmospheric simulation chamber laboratories across Europe.

Beyond the scientific sessions, the workshop provided valuable opportunities to strengthen the ASCC network, align ongoing efforts with the broader ACTRIS framework, and identify priorities for future joint initiatives and training activities.

The success of this first dedicated ASCC workshop demonstrates the community's commitment to capacity building, collaboration, and the continuous improvement of ACTRIS services through the active involvement of its scientific and technical members.

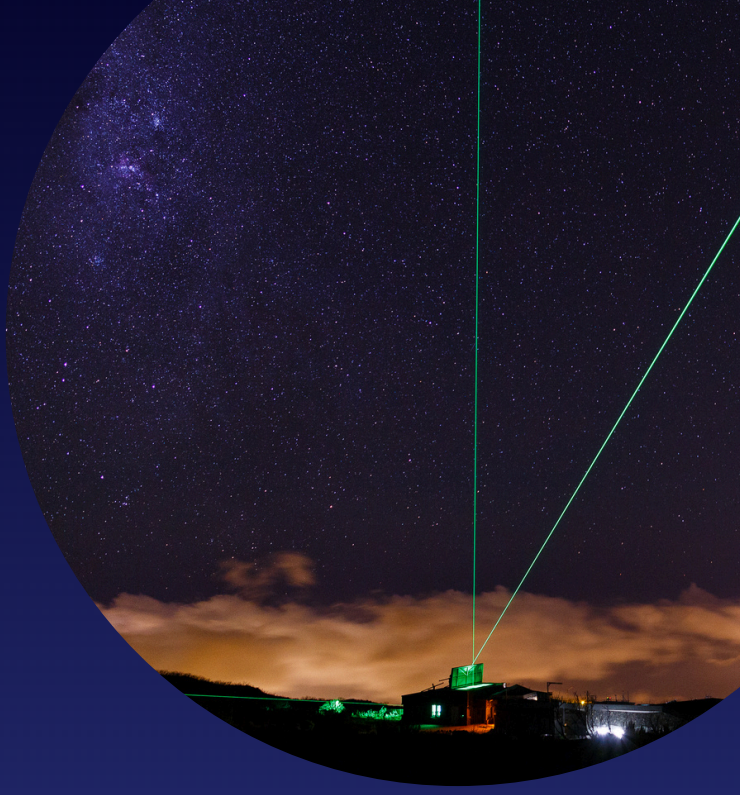
CCRES

Strengthening the Cloud Remote Sensing Community

CCRES and the cloud remote sensing data centre unit (CLU) co-organized an online workshop with around 50 participants, fostering knowledge exchange within the Cloud Remote Sensing community. Sessions focused on services provided by CCRES and CLU to ACTRIS National Facilities, including Doppler Cloud Radar, Microwave Radiometer, and Doppler Lidar operations, EarthCARE calibration/validation, and updates from the CloudNet Data Centre.

The workshop showcased research contributions covering topics such as disdrometer calibration, long-term cloud and water vapour statistics, cloud radar data exploitation, and novel cloud classification approaches.

This event reinforced collaboration, shared expertise, and the continued development of high-quality cloud remote sensing capabilities within ACTRIS.



3

Fostering Collaboration and Innovation

Connecting science, technology and society through partnerships that drive innovation and impact

112 Research Performing Organizations

17 Countries

89M€ Financial Volume

250+ Publications reported

27 Projects

Partnering for Success

ACTRIS-NDACC MoU

In May 2024, the ACTRIS General Assembly approved and signed a Memorandum of Understanding (MoU) with the Network for the Detection of Atmospheric Composition Change (NDACC). This landmark agreement, the first international collaboration formally established by ACTRIS, reflects the long-standing scientific heritage, shared objectives, and overlapping stakeholders between the two communities.

The MoU lays the foundation for closer cooperation in data sharing, joint research, and scientific service activities.

Several ACTRIS National Facilities build on NDACC stations and expertise, and members of the NDACC Steering Committee are already actively involved in ACTRIS Topical Centres.

This collaboration will further strengthen the integration of global ground-based atmospheric composition monitoring and enhance ACTRIS's role in addressing critical environmental challenges.

ACTRIS ERIC Joins the ERIC Forum

ACTRIS ERIC officially joined the ERIC Forum, marking an important step in strengthening collaboration with other European Research Infrastructure Consortia. The signing of the Memorandum of Understanding was celebrated by ACTRIS Director General Eija Juurola (to the left in the picture) and ERIC Forum ExBo Chair Antje Keppler (to the right in the picture).

The ERIC Forum provides a platform for exchange of knowledge, best practices, and coordinated action, supporting EU policy implementation and addressing major societal challenges. Through this membership, ACTRIS reinforces its role in the European research landscape and contributes to joint efforts in advancing Earth system observation and delivering knowledge for sustainable solutions.

External Relations

ACTRIS strengthens its international reach with the completion of the Cabo Verde station

ACTRIS-D, the German Consortium of ACTRIS ERIC, reached a major milestone with the completion of the Cabo Verde Atmospheric Observatory (CVAO), expanding its observation network into the tropical Atlantic; one of the most critical regions for studying climate and air–sea interactions.

Operated jointly by the Cape Verde Institute for Meteorology and Geophysics (INMG), TROPOS, MPI-BGC, and the University of York, the CVAO is now a fully integrated ACTRIS National Facility. Supported by over €3 million from Germany's ACTRIS-D programme, the expansion included a new laboratory building in Calhau and a remote sensing station in Mindelo, enabling comprehensive observations of aerosols, clouds, and radiation. The site combines advanced in-situ and remote sensing instruments, including a TROPOS-developed lidar, microwave radiometer, wind lidar, and cloud radar; together forming a unique ACTRIS node for tropical atmospheric research. Officially inaugurated during the visit of the German and Cabo Verdean presidents, the station now serves as a key ACTRIS reference site for the ESA–JAXA EarthCARE satellite and contributes to international campaigns such as ORCESTRA and ATMO-ACCESS.

The completion of the Cabo Verde station underscores ACTRIS's commitment to providing global-scale, high-quality observations essential for advancing climate science and satellite validation.

NASA Delegation Visits ACTRIS–INOE Observation Facility in Romania

On 18 October 2024, the National Institute for Research and Development in Optoelectronics (INOE 2000) hosted a high-level delegation from the National Aeronautics and Space Administration (NASA), the United States Embassy, and the Romanian Space Agency (ROSA). The visit highlighted INOE's scientific excellence and its strong engagement in international collaborations within ACTRIS and other major atmospheric research networks.

During the visit, the delegation toured INOE's state-of-the-art aerosol in situ, aerosol remote sensing, and cloud remote sensing laboratories, gaining insight into ongoing research on atmospheric composition and environmental monitoring. Discussions focused on advances in aerosol measurement technologies, satellite product validation, and future opportunities for transatlantic cooperation.

The visit also underscored INOE's active participation in CARGO-ACT (Cooperation and Agreements enhancing Global Interoperability for Aerosol, Cloud and Trace Gas Research Infrastructures); a joint project (2024–2027) between ACTRIS and three major U.S. agencies: the DOE ARM User Facility, NASA's MPLNET, and NOAA's Global Monitoring Laboratory (GML). CARGO-ACT marks an important milestone toward establishing a globally interoperable research infrastructure for atmospheric observations.

As the ACTRIS National Facility for Remote Sensing, INOE plays a key role in connecting European expertise with global initiatives. Its active involvement in EARLINET, E-PROFILE, and AERONET networks continues to strengthen data interoperability, foster scientific exchange, and ensure the reliability of atmospheric observations worldwide.

External Relations

ACTRIS Engages in Global Metrology for Climate and Environment

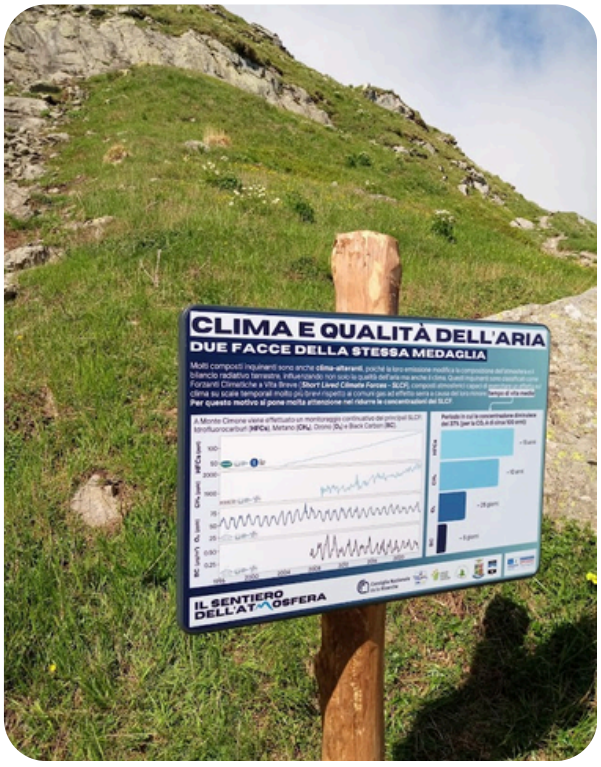
From 16 to 18 September 2024, ACTRIS participated in the 1st Stakeholder Meeting of the CIPM Sectorial Task Group on Climate Change and Environment, hosted at the BIPM headquarters in Sèvres, France. The Task Group provides a global focal point for metrology activities related to climate and environmental monitoring. Its aim is to coordinate and advance measurement standards critical for understanding and addressing climate change. Presentations and posters showcased progress on 128 recommendations and new initiatives emerging from the 2022 BIPM-WMO Workshop on Metrology for Climate Action, a workshop to which ACTRIS previously contributed.

During the meeting, Thérèse Salameh (IMT Nord Europe, CiGas deputy leader) delivered a presentation highlighting ACTRIS's mission, with a particular focus on the CiGas developments and activities. The three-day event covered topics ranging from cryosphere monitoring to atmospheric composition measurements, bringing together metrology and observational research communities to share cutting-edge science and best practices.
ACTRIS's engagement in this international forum underscores its role in advancing measurement standards, strengthening global collaborations, and ensuring the reliability of atmospheric observations critical for climate research and policy.

Celebration of the 20th Anniversary of the "Atmospheric Path" at Monte Cimone (Italy)

On 7–8 June 2024, CNR-ISAC, in collaboration with the Italian Air Force and Parchi Emilia Centrale, celebrated the 20th anniversary of the Atmospheric Path, an educational trail culminating at the ACTRIS/ICOS/GAW Global Station at Monte Cimone. The trail, visited annually by schools and tourists, serves as an open-air laboratory and classroom, showcasing how atmospheric observations are conducted to study climate and air quality.

For the anniversary, didactic panels along the trail were fully updated, and participants toured the observatory, learning about daily pollution monitoring and atmospheric composition. The event, held on World Environment Day, included a conference, a summit hike, guided tours of the scientific facilities, and a "Concert for Climate," highlighting ACTRIS's role in education, outreach, and global atmospheric monitoring.



External Relations

ACTRIS presence in the European and global research infrastructure landscape

In 2024, ACTRIS ERIC actively strengthened its visibility and engagement within the European and international research landscape through participation in key high-level events.

ACTRIS ERIC took part in the Belgian Presidency Conference on Research Infrastructures "Research Infrastructures in a Changing Global, Environmental and Socio-economic Context" and the workshop "Fostering the ERICs as Strategic Assets of the European Research Area", both held in Brussels in June 2024.

ACTRIS was also invited to contribute as a speaker and panelist at the International Conference on Research Infrastructures (ICRI 2024) and at the associated side event on European Environmental Research Infrastructures.

Earlier in the year, in January 2024, the ACTRIS ERIC Director General participated as an invited speaker at the Polar Night Week organized by SIOS.

Additionally, ACTRIS ERIC contributed to the first edition of the ESFRI Research Infrastructure Portfolio, published in spring 2024, which provides comprehensive information on ESFRI Projects and Landmarks and highlights their role within the European Research Area.

ACTRIS ERIC was represented in EUROGEO Workshop 2024, organized in Krakow, IAGOS 30th Anniversary Celebration, and ERIC Forum meetings.

ICRI 2024

Innovation and Collaboration with Industry

Bridging Science and Industry via Innovations Activities

In June 2024, ACTRIS contributed to the annual Innovation in Atmospheric Measurement Techniques Workshop 🔗 , organized by the Climate and Atmosphere Research Center (CARE-C) of the Cyprus Institute, in collaboration with key European research infrastructures, including ICOS and IAGOS. The workshop brought together scientists, instrument developers, and industrial end-users to exchange on emerging atmospheric measurement technologies and their practical applications.

The event's strong industry participation created a direct interface between technology developers and real-world users.

This aligns closely with the goals of the ENVRINNOV project 🔗, which seeks to strengthen and coordinate innovation across environmental research infrastructures through the creation of the ENVRI Innovation Hub.

By contributing to such collaborative innovation environments, ACTRIS helps ensure that emerging measurement technologies are rapidly translated into impactful tools for research and operational monitoring, demonstrating the concrete value of ENVRINNOV's coordinated innovation framework.

ENVRINNOV

Pioneering Aerosol Observations with CE710 LiDAR: Advancing ACTRIS Capabilities 🔗

ACTRIS continues to strengthen its leadership in high-quality aerosol and cloud observations through the deployment and validation of the CE710 LiDAR, a state-of-the-art multi-spectral system developed in collaboration with LOA (University of Lille) and CIMEL.

The CE710 LiDAR provides high-resolution vertical profiles of aerosols and clouds, while integrated photometry delivers column-integrated aerosol properties. This combination ensures enhanced data quality, precise calibration, and standardized measurements across ACTRIS stations, meeting the infrastructure's stringent Quality Assurance guidelines.

Since joining ACTRIS in 2015 via its precursor LILAS system, the CE710 has evolved into a modular, transportable, and future-proof instrument. Its multi-wavelength emissions, up to 15 detection channels, and advanced laser and fluorescence capabilities allow ACTRIS to:

- Characterize aerosol physical and chemical properties in unprecedented detail
- Provide high-quality data for atmospheric models and climate research
- Standardize measurements across the ACTRIS network through integrated calibration and AUSTRAL software for real-time processing

The CE710's deployment strengthens ACTRIS's community of Lidar professionals, supporting cross-site data consistency, collaborative research, and training opportunities. Its modular design ensures adaptability to evolving scientific needs, making it a cornerstone of ACTRIS's aerosol observation capabilities for years to come.

Innovation and Collaboration with Industry

Experiments at the atmospheric simulation chamber SAPHIR

In the summer of 2024, experiments were carried out in the SAPHIR chamber mimicking conditions in the Delhi urban area.

Groups from the Universities of Birmingham and Nottingham joined forces with Airyx, a company specializing in novel gas sensing technologies.

Conditions in the chamber were pushed to 'extreme' pollution events, comparable to those observed during field campaigns in Delhi. This allowed Airyx's instruments to be tested in a wide range of chemical regimes, ensuring their stability and durability for long-term measurements in a variety of environments.

Translating research into innovative Service Tools: the RI-URBANS project featured in Green Deal's success stories

The project RI-URBANS (Research Infrastructures Services Reinforcing Air Quality Monitoring in European Urban & Industrial Areas), in which ACTRIS plays a leading role, was featured in the publication "13 Success Stories of Green Deal Projects." This recognition highlights how research infrastructures like ACTRIS are driving innovation and contributing to the objectives of the European Green Deal.

RI-URBANS translates advanced atmospheric research and ACTRIS data into operational service tools that enhance urban and industrial air quality monitoring. These tools include advanced methodologies for source apportionment, ultrafine particle and oxidative potential monitoring, and real-time data integration between ACTRIS research platforms and air quality monitoring networks.

By co-developing these services with air quality agencies, city authorities, and technology providers, RI-URBANS demonstrates how ACTRIS-based innovations can directly support policy implementation, health impact assessment, and urban air quality management. The project exemplifies how ACTRIS fosters collaboration across sectors, bridging science, policy, and industry, to deliver solutions that improve environmental and societal well-being.

Innovation and Collaboration with Industry

Advancing Climate Observation through Innovation: ACTRIS and the EarthCARE Mission

The EarthCARE satellite mission, a joint initiative of the European Space Agency (ESA) and the Japanese Space Agency (JAXA), marks a major milestone in atmospheric science. Launched on 29 May 2024, the mission delivers unprecedented insights into the interactions between clouds, aerosols, and radiation, key components influencing the Earth's climate system.

To ensure the mission's success, ACTRIS plays a central role in the calibration and validation (cal/val) of EarthCARE's satellite data. Leveraging a network of around 40 advanced ground-based stations across Europe and beyond, ACTRIS provides essential reference measurements using cutting-edge lidar and radar technologies. These facilities enable accurate comparison of satellite and ground observations, strengthening confidence in EarthCARE's data and supporting its use in climate models, weather forecasting, and environmental monitoring services.

ACTRIS's dense observational network, strategically distributed across diverse environments, offers a unique advantage for continuous calibration. With EarthCARE revisiting the same region every 25 days, ACTRIS ensures near-daily validation opportunities, maximizing data quality and reliability.

The largest ground-based contribution during EarthCARE's first year of operation came from ACTRIS, through its involvement in the ATMO-ACCESS pilot project.

Over 40 ACTRIS ground-based stations across Europe, equipped with state-of-the-art lidar and radar instruments, provided long-term, high-resolution measurements of aerosol and cloud properties. These stations were strategically aligned with EarthCARE satellite overpasses, creating a powerful platform for cross-validation. ACTRIS Central Facilities supported the campaign by offering calibrated reference data, expert services, and quality assurance, further strengthening the mission's scientific output. Collaborations with other networks, such as EARLINET and MPL-Net, contributed to a shared repository of validation data and a truly integrated observing system. ESA's recognition of ACTRIS as a key Cal/Val partner reflects the infrastructure's growing relevance for satellite validation and Earth system monitoring. The data collected will help refine EarthCARE algorithms and enhance the reliability of climate and weather models worldwide.

Beyond its scientific value, the EarthCARE campaign exemplifies how ACTRIS innovation and infrastructure enable cross-sector collaboration, providing reliable atmospheric data for space agencies, research organizations, and environmental service providers. These partnerships strengthen Europe's capacity for climate monitoring and sustainable technology development, reinforcing ACTRIS's role as a key enabler of innovation and industry application in atmospheric research.

Image credit: ESA

Innovation and Collaboration with Industry

Ensuring quality and fostering industry collaboration through ACTRIS-Compliant instruments

In 2024, ACTRIS finalized and officially released the ACTRIS-Compliant Instrument process, marking a major milestone in ensuring the quality, traceability, and reliability of atmospheric measurements across the research infrastructure. This achievement strengthens ACTRIS's position as a key provider of high-quality, standardized data on short-lived atmospheric components, supporting both scientific excellence and technological innovation.

The process is coordinated by the ACTRIS Topical Centres and the Data Centre (DC), which jointly define, implement, and maintain strict quality criteria for measurements, calibrations, and data processing. These criteria, rooted in internationally recognized standards and scientific literature, are now publicly available, serving not only ACTRIS data providers and users but also instrument manufacturers.

With the publication of the ACTRIS instrument requirements, manufacturers can now formally assess and demonstrate the compliance of their instruments with ACTRIS standards. They are invited to participate in instrument performance workshops organized by the Topical Centres, where instruments are tested against ACTRIS-defined specifications. Following successful evaluation, instruments are documented and may be listed as ACTRIS-compliant upon request.

This transparent and rigorous framework benefits both science and industry. It drives the development and improvement of atmospheric measurement technologies, while offering manufacturers visibility and recognition; reinforcing trust, credibility, and the uptake of validated technologies across both research and operational contexts.

Growing the ACTRIS Community

A new look for a growing community

In 2024, ACTRIS unveiled its new visual identity, marking an important step in strengthening our community's shared image and voice. The redesign embodies what ACTRIS has become — a dynamic, collaborative, and forward-looking research infrastructure serving a growing network of scientists, technical experts, and partners across Europe.

The new identity, detailed in the ACTRIS Brand Guidelines, brings together all parts of ACTRIS under a unified visual language. Rolling out the new look was not just a design exercise — it was a community effort. It helped align how ACTRIS presents itself, ensuring that every station, document, and event communicates one coherent message: we are the ACTRIS Community.

ACTRIS Week 2024

The ACTRIS Week is the annual meeting of the ACTRIS community, bringing together scientists, technical experts, management teams, and partners to share progress, align on strategic goals, and strengthen collaboration across the research infrastructure.

The ACTRIS Week 2024, held in Matera, Italy, brought together the largest ACTRIS community gathering to date — a testament to the infrastructure's growing reach and engagement. With 190 participants on-site and over 350 participants in total, the event fostered vibrant exchange, collaboration, and strategic dialogue across all components of ACTRIS.

The purpose of ACTRIS Week is to foster collaboration, knowledge exchange, and community building among all ACTRIS components — from Central Facilities and National Facilities to the ACTRIS ERIC headquarters and partner organizations. The 2024 edition focused on strengthening connections across the network, promoting innovation in atmospheric research, and discussing the future direction of ACTRIS services and infrastructure development.


Image Credit: Niku Kivekäs

Sessions and workshops explored a wide range of topics, including data and service integration, technological innovation, stakeholder engagement, and international collaboration.

These discussions not only advanced shared understanding of ACTRIS's role in environmental research but also laid the groundwork for new joint activities and cross-border initiatives within the broader European and global research landscape.

"ACTRIS Week 2024 clearly demonstrated the strength of our community: open, ambitious, and ready to take the next steps together. "
Eija Juurola, ACTRIS ERIC Director General

Growing the ACTRIS Community

ACTRIS Science Conference 2024

In May 2024, ACTRIS hosted its first in-person international science conference, welcoming 350 participants from 29 countries to Rennes, France. Held at the historic Couvent des Jacobins, the four-day event became a landmark moment for the ACTRIS community, gathering scientists, students, and stakeholders to explore the latest advances in atmospheric, air quality, and climate research, and their connections to human health. Organised around five scientific themes, the conference offered a multidisciplinary view of atmospheric sciences — from aerosol–cloud interactions and advanced measurement techniques to data services, innovation, and societal applications. With over 280 abstracts accepted and 165 posters presented, the programme fostered dynamic scientific exchange and collaboration across the ACTRIS network and beyond.

Beyond the scientific sessions, the conference served as a true platform for engagement and outreach. Fifteen exhibitors and ten sponsors, including regional and national institutions, supported the event and facilitated dialogue between academia, industry, and public authorities. Outreach activities extended its impact beyond the research community: over 90 secondary school students and teachers took part in climate-awareness workshops and film screenings, while a public evening conference on the climate

emergency opened discussions to citizens.

The conference also reflected ACTRIS's commitment to sustainability and inclusivity. Eco-friendly practices, local food sourcing, and low-impact event design minimised the environmental footprint. Participants expressed strong satisfaction — over 98% rated their experience highly — praising the atmosphere of collaboration and the seamless blend of science and community spirit.

The ACTRIS Science Conference 2024 set a new benchmark for scientific excellence, engagement, and visibility, showcasing the power of a united community working toward a clearer, healthier atmosphere.


Image Credit: Niku Kivekäs

4

Strengthening operations, governance and sustainability

Ensuring effective governance and sustainable operations to secure ACTRIS trustworthy capacity to serve science and society

Progresses of the ACTRIS National Facility Labelling process

The process of labelling ACTRIS National Facilities is an essential part of ACTRIS operations. Through this process, the National Facilities are certified as providers of high-quality data that meets ACTRIS operational standards. All ACTRIS National Facilietis must go through the labelling process, which is carried out by the Topical Centres, Data Centre and the Head Office.

The ACTRIS Topical Centres provide operation support to the National Facilities through calibration, quality control, intercomparison campaigns, and standard operating procedures, while the Data Centre ensures that the data are easily accessible to users. The ACTRIS ERIC General Assembly formally approves the labels for ACTRIS NFs that have successfully completed the labelling process.

The labelling of ACTRIS National Facilities commenced in 2023, focusing initially on the Observational Platforms. The process will later be extended to include the Exploratory Platforms.

Table 1: Statistics of the labelling of ACTRIS National Facilities (only Observational Platforms) by 2024

Component	Not started	In process	Initially accepted	*Initially accepted fraction*
Aerosol In Situ	16	14	27	47%
Cloud In Situ	6	3	0	0
Reactive Trace Gases In Situ	13	10	3	12%
Aerosol Remote Sensing	8	17	12	32%
Cloud Remote Sensing	4	8	9	43%
Reactive Trace Gases Remote Sensing	4	2	2	25%
Total now	51	54	53	34%

Updates on ACTRIS ERIC Management

ACTRIS ERIC Appoints its First Director General

In 2024, ACTRIS ERIC reached a major milestone with the appointment of its first Director General, Eija Juurola. Having already served as Interim Director General since the establishment of ACTRIS ERIC in 2023, she now takes on a five-year mandate to lead the strategic and operational development of the Research Infrastructure.

Reflecting on her appointment, Juurola stated: *"I am honored to be selected as the first Director General and to lead this remarkable organization. Together, we will advance and consolidate the ACTRIS vision and mission and enhance its impact on society."*

Jean-Marie Flaud, Chair of the ACTRIS ERIC General Assembly, welcomed the appointment: *"Her expertise and leadership will be invaluable as we continue to expand ACTRIS capabilities and drive innovation in atmospheric science."*

Change in ACTRIS Scientific Chair

Paolo Laj, whose involvement with ACTRIS began at its inception, has played a pivotal role from the early conceptualization through the preparation and implementation phases, ultimately contributing to the establishment of ACTRIS as an ERIC in April 2023. During his tenure as ACTRIS Scientific Chair over the past three years, he has significantly strengthened ACTRIS' position in the atmospheric research landscape.

Beginning in January 2025, Professor Tuukka Petäjä will assume the newly titled role of ACTRIS Scientific Advisor, serving until 2029. While the responsibilities remain aligned with the previous position, the updated title better reflects ACTRIS' evolving structure and needs. In this capacity, Tuukka will support ACTRIS' international visibility and provide strategic guidance on scientific and research developments.

New Host for the Cloud in Situ Measurements Unit

The Topical Centre for Cloud in Situ Measurements (CIS) has welcomed a new host for its Centre for Cloud Particle Properties (CCPar) unit. During the 3rd ACTRIS General Assembly, delegates approved Laboratoire de Météorologie Physique (LaMP, France) as the new host, ensuring the continued implementation of essential cloud in situ variables within ACTRIS.

Jointly operated by the Centre National de la Recherche Scientifique (CNRS) and the Université Clermont Auvergne (UCA), LaMP brings extensive expertise in in situ cloud microphysics observations and operates France's airborne platform for cloud measurements (PMA), dedicated to studying mixed-phase and ice clouds from research aircraft.

The unit has also established the national cloud probe calibration centre and demonstrated strong capabilities in cloud data processing. In addition, LaMP manages the natural wind tunnel facility at Puy de Dôme (PDD), which has hosted key experiments for fog monitor and FSSP intercomparisons.

With this new hosting arrangement, CIS looks forward to implementing the CCPar unit, enabling the quality control and standardized provision of high-value cloud variables to ACTRIS National Facilities, strengthening the infrastructure's capacity to deliver reliable, high-quality cloud observations for climate and atmospheric research.

ACTRIS Central Facilities Financial Review 2024

This review provides information on the ACTRIS Central Facilities (CF) operational activities in the financial year 2024. The ACTRIS CFs are not financially audited, and their finances are reported to the ACTRIS ERIC General Assembly for discussion and information. The auditable part of ACTRIS ERIC includes the Head Office activities operated in Finland.

The year 2024 marked the first full year of ACTRIS ERIC, following its establishment in mid-2023. In 2024, 17 member countries contributed to ACTRIS by paying Membership Contributions distributed to Central Facilities and to ACTRIS ERIC. ACTRIS operations were funded also by Host Contributions, which refer to in-kind or in-cash support provided by the CF Unit host organisations, located in 12 member countries, intended to cover approximately 70% of the operation costs. Other revenues, received through EU and national project funding, supplemented the core funding and activities.

The 2023 Membership Contributions were fully collected and released in early 2024, which meant that all the CF Units could not utilise or report these funds retroactively.

This led to some financial deviations, as the absence of 2023 Membership Contributions in the 2023 financial reports resulted in a positive outcome in many cases in the 2024 reporting. Final balancing is expected in the 2025 reporting cycle. Consequently, the Key Performance Indicators related to deviation from budgeted revenue and deviation from budget balance were negative in 2023 but showed a positive trend in 2024.

In 2024, the personnel costs represented more than half of the total operation costs, amounting to 1 050 Person Months (PM). This includes the work efforts funded through both core funding and external project revenues. The use and maintenance of equipment accounted for 10% of the total costs. Travel costs remained low, at approximately 3%, as virtual, hybrid and back-to-back meetings were widely used. The remaining 30% of other costs included organisational overheads, consumables, facility spaces and event related expenses including internal meetings, ACTRIS 2024 Science Conference and technical campaigns and training sessions organized by the CF Units.

ACTRIS Central Facilities Financial Review 2024

Table 2: ACTRIS Central Facilities Financial Review 2024

ACTRIS Central Facilities		
OPERATION REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	3 206 090	*801 555*
Host Contribution Austria	386 106	*131 563*
Host Contribution Belgium	275 945	*98 792*
Host Contribution Czech Republic	87 705	*92 703*
Host Contribution Finland	1 661 735	*1 052 938*
Host Contribution France	1 939 964	*1 318 345*
Host Contribution Germany	1 592 814	*873 755*
Host Contribution Italy	1 225 641	*789 693*
Host Contribution Netherlands	936 157	*157 196*
Host Contribution UK	0	*1 933*
Host Contribution Norway	582 594	*572 823*
Host Contribution Romania	272 590	*145 026*
Host Contribution Spain	299 226	*241 679*
Host Contribution Switzerland	358 268	*57 569*
Other Revenues	910 482	*297 187*
TOTAL REVENUES	**13 735 317**	***6 632 757***

ACTRIS Central Facilities Financial Review 2024

Table 3: ACTRIS Central Facilities Financial Review 2024

ACTRIS Central Facilities		
OPERATION COSTS		
Personnel Costs	7 034 006	*4 370 626*
Equipment Costs	1 249 435	*806 321*
Travel Costs	392 810	*454 548*
Other Costs	4 025 052	*2 077 044*
TOTAL COSTS	**12 701 302**	***7 708 539***
BALANCE REVENUES - COSTS	**1 034 015**	***-1 075 782***
KPI Deviation Budget Balance	8%	*-16%*
KPI Deviation Budgeted Revenue	15%	*-14%*
PERSON MONTHS	**1 050**	***679***

MEMBERSHIP CONTRIBUTIONS 2024

AUSTRIA	96 865
BELGIUM	128 664
BULGARIA	72 739
CYPRUS	89 401
CZECH REPUBLIC	103 485
DENMARK	70 246
FINLAND	180 067
FRANCE	315 407
GERMANY	505 778
ITALY	320 619
NETHERLANDS	136 162
NORWAY	95 014
POLAND	142 714
ROMANIA	147 967
SPAIN	204 847
SWEDEN	138 371
SWITZERLAND	107 876
	2 856 222

5 Annexes

Annex I - ACTRIS Central Facility Financial Reports 2024

A 2024 financial review for each ACTRIS Central Facility (Head Office, Data Centre, Centre for Aerosol In Situ (CAIS-ECAC), Centre for Aerosol Remote Sensing (CARS), Centre for Cloud In Situ (CIS), Centre for Cloud Remote Sensing (CCRES), Centre for Reactive Trace Gases In Situ (CiGas), Centre for Reactive Trace Gases Remote Sensing (CREGARS).

Head Office

There are three Units in Finland and one in Italy.

HEAD OFFICE		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	261 391	*193 593*
Host Contribution Finland	870 847	*535 200*
Host Contribution Italy	255 640	*131 860*
Other Revenues	308 646	*2 121*
TOTAL REVENUES	**1 696 524**	***862 774***
Operation COSTS		
Personnel Costs	757 792	*402 023*
Equipment Costs	18 782	*2 823*
Travel Costs	92 071	*34 422*
Other Costs	625 695	*321 760*
TOTAL COSTS	**1 494 340**	***761 028***
BALANCE Operation Revenues - Costs	**202 184**	***101 746***
KPI Deviation Budget Balance	12%	*12%*
KPI Deviation Budgeted Revenue	21%	*-7%*
Operation Person Months	**122**	***54***

Annex I - ACTRIS Central Facility Financial Reports 2024

Data Centre (DC)

There were ten financial Units in DC of which three consisted of eight Sub-Units.

DATA CENTRE		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	586 989	*416 259*
Host Contribution Finland	443 282	*252 852*
Host Contribution France	636 760	*516 034*
Host Contribution Italy	463 804	*333 069*
Host Contribution Norway	582 594	*572 823*
Host Contribution Spain	0	*0*
Other Revenues	187 138	*0*
TOTAL REVENUES	**2 900 567**	***2 091 037***
Operation COSTS		
Personnel Costs	1 595 329	*1 159 574*
Equipment Costs	172 875	*179 459*
Travel Costs	83 815	*52 583*
Other Costs	1 048 548	*830 714*
TOTAL COSTS	**2 900 567**	***2 222 330***
Balance Operation Revenues - Costs	**0**	***-131 293***
KPI Deviation Budget Balance	0%	*-6%*
KPI Deviation Budgeted Revenue	0%	*1%*
Operation Person Months	**202**	***168***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Aerosol In Situ Measurements – European Centre for Aerosol Calibration and Characterisation (CAIS-ECAC).

There were six Units in CAIS-ECAC of which one consisted of three Sub-Units.

CAIS-ECAC		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	619 134	*46 470*
Host Contribution Czech Republic	87 705	*92 703*
Host Contribution Finland	127 655	*78 157*
Host Contribution France	288 490	*197 763*
Host Contribution Germany	510 799	*333 209*
Host Contribution Italy	108 536	*76 385*
Other Revenues	57 814	*0*
TOTAL REVENUES	**1 800 133**	***824 687***
OPERATION COSTS		
Personnel Costs	795 035	*490 418*
Equipment Costs	203 809	*145 879*
Travel Costs	41 285	*30 494*
Other Costs	523 827	*213 737*
TOTAL COSTS	**1 563 956**	***880 528***
BALANCE REVENUES - COSTS	**236 177**	***-55 841***
KPI Deviation Budget Balance	13%	*-7%*
KPI Deviation Budgeted Revenue	11%	*-20%*
PERSON MONTHS	**136**	***98***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Aerosol Remote Sensing (CARS)

There were nine Units in CARS of which one consisted of two Sub-Units.

CARS		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	535 815	*0*
Host Contribution France	317 950	*177 860*
Host Contribution Germany	206 590	*75 657*
Host Contribution Italy	397 660	*248 380*
Host Contribution Romania	272 590	*145 026*
Host Contribution Spain	299 226	*241 679*
Host Contribution Switzerland	275 300	*0*
Other Revenues	275 846	*49 098*
TOTAL REVENUES	**2 580 978**	***937 700***
Operation COSTS		
Personnel Costs	1 406 056	*758 799*
Equipment Costs	346 387	*182 024*
Travel Costs	48 226	*26 724*
Other Costs	462 290	*287 303*
TOTAL COSTS	**2 262 959**	***1 254 850***
Balance Operation Revenues - Costs	**318 019**	***-317 150***
KPI Deviation Budget Balance	12%	*-34%*
KPI Deviation Budgeted Revenue	24%	*-27%*
Operation Person Months	**279**	***189***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Cloud In Situ Measurements (CIS)

There were four Units in CIS of which one consisted of two Sub-Units. One Unit was elected in mid-2024 and did not perform operational activities yet in 2024.

CIS		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	76 374	*0*
Host Contribution Austria	108 156	*0*
Host Contribution Germany	232 884	*0*
Host Contribution NN	0	*0*
Other Revenues	0	*0*
TOTAL REVENUES	**417 414**	***0***
Operation COSTS		
Personnel Costs	273 729	*0*
Equipment Costs	3 860	*0*
Travel Costs	9 503	*0*
Other Costs	130 322	*0*
TOTAL COSTS	**417 414**	***0%***
Balance Operation Revenues - Costs	**0**	***0***
KPI Deviation Budget Balance	0%	
KPI Deviation Budgeted Revenue	20%	
Operation Person Months	**34**	***0***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Cloud Remote Sensing (CCRES)

There were four Units in CCRES of which one consisted of two Sub-Units.

CCRES		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	257 914	*9 705*
Host Contribution Finland	55 263	*42 400*
Host Contribution France	273 420	*156 661*
Host Contribution Germany	72 197	*25 239*
Host Contribution Netherlands	93 475	*92 030*
Host Contribution UK	0	*1 933*
Other Revenues	36 730	*119 065*
TOTAL REVENUES	**788 999**	***447 033***
Operation COSTS		
Personnel Costs	425 640	*280 143*
Equipment Costs	17 681	*52 616*
Travel Costs	15 222	*10 659*
Other Costs	195 993	*106 254*
TOTAL COSTS	**654 536**	***449 672***
Balance Operation Revenues - Costs	**134 463**	***-2 639***
KPI Deviation Budget Balance	17%	*-1%*
KPI Deviation Budgeted Revenue	-1%	*-22%*
Operation Person Months	**69**	***45***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Reactive Trace Gases In Situ Measurements (CiGas)

There were six Units in CiGas.

CiGas		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	597 687	*0*
Host Contribution Finland	164 688	*144 329*
Host Contribution France	238 449	*217 136*
Host Contribution Germany	544 667	*419 850*
Host Contribution Switzerland	82 968	*57 569*
Other Revenues	21 416	*60 292*
TOTAL REVENUES	**1 649 875**	***899 176***
Operation COSTS		
Personnel Costs	861 275	*628 441*
Equipment Costs	89 382	*40 388*
Travel Costs	46 328	*29 372*
Other Costs	572 952	*273 707*
TOTAL COSTS	**1 569 937**	***971 908***
Balance Operation Revenues - Costs	**79 938**	***-72 732***
KPI Deviation Budget Balance	5%	*-8%*
KPI Deviation Budgeted Revenue	5%	*-13%*
Operation Person Months	**121**	***101***

Annex I - ACTRIS Central Facility Financial Reports 2024

Centre for Reactive Trace Gases Remote Sensing (CREGARS)

There were eight Units in CREGARS of which one consisted of two Sub-Units.

CREGARS		
Operation REVENUES	**Report 2024**	***Report 2023***
Membership Contribution	207 552	*135 528*
Host Contribution Austria	277 950	*131 563*
Host Contribution Belgium	275 945	*98 792*
Host Contribution France	184 895	*52 890*
Host Contribution Germany	25 677	*19 800*
Host Contribution Netherlands	842 682	*65 166*
Other Revenues	22 891	*66 611*
TOTAL REVENUES	**1 837 592**	***570 350***
Operation COSTS		
Personnel Costs	919 150	*408 817*
Equipment Costs	396 658	*14 108*
Travel Costs	56 359	*17 715*
Other Costs	465 424	*129 711*
TOTAL COSTS	**1 837 592**	***570 351***
Balance Operation Revenues - Costs	**0**	***-1***
KPI Deviation Budget Balance	0%	*0%*
KPI Deviation Budgeted Revenue	63%	*-27%*
Operation Person Months	**88**	***48***

Annex II - International education and training activities

1- ACTRIS Aerosol School at NAOK (14.4. – 20.4. 2024), 16 participants.

2- ACTRIS training course “Atmospheric observations of aerosols, clouds and trace gases”, Helsinki/online, 20-24.5.2024, organized by the University of Helsinki.

3- AGORA Aerosol Training course ‘Characterization of atmospheric aerosol using in-situ and remote sensing techniques’ organised by the Andalusian Global ObseRvatory of the Atmosphere (AGORA) in Granada, Spain. The school was attended by 35 participants.

4- Autumn School "Analysis of Atmosphere-Surface Interactions and Feedbacks", Hyytiälä forestry field station, Finland, 7.-18.10.2024, organized by the University of Helsinki.

5- Autumn School organised by CARE-C at the Cyprus Institute’s premises in Nicosia on 11-15.11.2024.

6- HErZ 2024 Summer School on Modern Methods for Atmospheric Profiling, organised by the JOYCE consortium (Research Center Jülich, Germany) in August 2024. The school gathered over 50 international participants.

7- Intensive course ‘Formation and Growth of Atmospheric Aerosols’, Hyytiälä forestry field station, Finland 12.-22.8.2024 in Hyytiälä, Finland, organized by the University of Helsinki.

8- Maïdo Observatory Summer School (MOSS) organised at La Réunion, France, on 18-22.11.2024. There were 40 participants, mostly PhD students, postdoctoral and young scientists. https://realistic.univ-reunion.fr/maido-observatory-summer-school-2024/

9- Training “Lidar Tools Training” on new lidar data analysis tool EMERALD for the ARS sites personnel in Poland (University of Warsaw, University of Wroclaw, and University of Silesia) organized by the University of Warsaw.

10- Winter School “Advanced analysis of atmosphere-surface interactions and feedbacks”, Hyytiälä forestry field station, Finland, 4-15.3.2024, organized by the University of Helsinki.

Annex III - Events in 2024

Name of the Event	Organizer	Date	Place	No of attendees
ENVRINNOV KOM	CARE-C	19-21.01.2024	Nicosia, Cyprus	40
ASC Meeting	BUW QUAREC-NF	19.03.2024	Wuppertal, Germany	36
ATMO-ACCESS Annual Meeting	BUW QUAREC-NF	19-21.03.2024	Wuppertal, Germany	70
GIVE KOM	LMU, TROPOS, DLR	25-27.03.2024	LMU Munich, Germany	45
MUOAA 2024	IRCELYON, PhLAM, EPOC, UM6P, ICARE-HELIOS	1-5.04.2024	Cargèse, France	80
Science Fair	The Cyprus Institute	17.04.2024	Nicosia, Cyprus	6000
EGU 2024	ENVRI Community	14-19.04.2024	Vienna, Austria	3000
ACTRIS Spain Annual meeting	Univ.Granada.IISTA	22-23.04.2024	Granada, Spain	16
ACTRIS-D Annual meeting	DWD + GUF	6-8.05.2024	Offenbach, Germany	40
ACTRIS Science Conference 2024	ACTRIS ERIC HO, ACTRIS France	13-16.05.2024	Rennes, France	350
Air ion and aerosol workshop	INAR, University of Helsinki and Tartu University	27-29.05.2024	Puhajärve, Estonia	35
3rd ACTRIS ERIC General Assembly	ACTRIS HO, Geosphere	28-29.05.2024	Vienna, Austria	30
ACTRIS2BE KO meeting	BIRA-IASB	09.06.2024	Brussels, Belgium	20
Scientific Day of SIRTA	IPSL	12.06.2024	Palaiseau, France	100
Earlinet meeting	Earlinet Council	23.06.2024	Landshut, Germany	50

Annex III - Events in 2024

Name of the Event	Organizer	Date	Place	# Attendees
Innovation in Atmospheric Measurement Techniques workshop	CARE-C, ACTRIS, IAGOS, ICOS	27.06.2024	Online	129
Life Lidar Demo	University of Warsaw	27-29.06.2024	Warsaw, Poland	200
RWS thematic morning	TNO	08.07.2024	Delft, Netherlands	20
HErZ VITAL I Campaign	JOYCE-NF consortium	8.2024	Jülich, Germany	20
ACTRIS-CH Annual Meeting	PMOD-WRC	22.08.2024	Davos, Switzerland	15
ACTRIS Norway Annual Meeting	NILU	26-27.08.2024	Birkenes, Norway	22
European Aerosol Conference	FAAR, Finnish Aerosol Foundation, ACTRIS-FI	25-30.08.2024	Tampere, Finland	1000
ICOS Science Conference	ACTRIS HO, CNRS	10-12.09.2024	Versailles, France	400
IAGOS 30th Anniversary	ACTRIS HO, CNRS	19.09.2024	Toulouse, France	100
RI-URBANS 3rd Science Meeting	ACTRIS HO, University of Helsinki and FMI	25-26.09.2024	Helsinki, Finland	50
Workshop on ACTRIS's scientific impact: preliminary results based on bibliometric analysis	CNR IMAA	26.09.2024	Potenza, Italy	50

Annex III - Events in 2024

Name of the Event	Organizer	Date	Place	No of attendees
23rd International Conference and School on Quantum Electronics "Laser Physics and Applications"	Institute of Electronics, Bulgarian Academy of Sciences	23-27.09.2024	Ravda, Bulgaria	>100
CAMPOLA 2024	UM6P, ICARE-HELIOS	2-4.10.2024	Ben Guerir, Maroc	60
OKO ACTRIS seminary for internal Stakeholders	ACTRIS-CZ	8-9.10.2024	Váňův Statek, Vysočina, Czech Republic	45
ACTRIS FR workshop 2024	CNRS	15-18.10.2024	St Pierre D'Oleron, France	74
XIII Konferencja Naukowa „Ochrona Powietrza w Teorii i Praktyce	Institute of Environmental Engineering of the Polish Academy of Sciences	15-18.10.2024	Zakopane, Poland	80
Launch of the ACTRIS-UBB Platform	UBB	21.10.2024	Cluj-Napoca, Romania	50
Air Quality Directive Workshop	INOE, UBB	21.10.2024	Cluj-Napoca, Romania	30
ACTRIS-RO meeting	UBB	21.10.2024	Cluj-Napoca, Romania	16
ACTRIS-CZ SAB meeting	ACTRIS-CZ	05.11.2024	Matera, Italy	15
ACTRIS WEEK 2024	CNR IMAA, ACTRIS ERIC HO	4-7.11.2024	Matera, Italy	200

Annex III - Events in 2024

Name of the Event	Organizer	Date	Place	No of attendees
CARS ARES workshop	CNR-IMAA	08.11.2024	Matera, Italy	90
CARGO ACT meeting	CNR-IMAA	08.11.2024	Matera, Italy	30
Sino-French Joint Workshop on Atmospheric Environment	Many RPOs involved	6-10.11.2024	Bordeaux, France	80
Annual Conference of the Czech Aerosol Society, Ovzduší v ČASe	CAS, RECETOX, ACTRIS-CZ	11-13.11.2024	OREA Resort Devět Skal Vysočina, Sněžné, CzR	75
ERATOTHENES Info DAY	ERATOSTHENES CoE	14.11.2024	Limassol	200
Obs4Clim Annual Meeting	CNRS, UCA	18-19.11.2024	Clermont Ferrand, France	35
4th ACTRIS ERIC General Assembly	ACTRIS HO	25-26.11.2024	Madrid, Spain	30
ICRI 2024	ACTRIS HO	3-5.12.2014	Brisbane, Australia	300
AGU 2024	ACTRIS HO	9-13.12.2024	Washington DC, USA	20000

Annex IV - Glossary

ACTRIS – The Pan-European distributed Aerosol, Clouds and Trace Gases Research Infrastructure which produces high-quality data documenting short-lived atmospheric constituents and processes leading to their variability in natural and controlled atmospheres and integrates, harmonizes and distributes datasets, activities and services provided by Central Facilities and National Facilities.

ACTRIS data – the data produced by the ACTRIS National Facilities complying with the procedures established within ACTRIS and is defined in ACTRIS data policy as accepted and amended by the decisions of the Interim ACTRIS Council and later General Assembly.

ACTRIS ERIC – The Aerosol, Clouds and Trace Gases Research Infrastructure European Research Infrastructure Consortium is the legal entity that coordinates and facilitates the operation of ACTRIS at the European level, ensuring long-term sustainability, governance, and strategic development of the research infrastructure. ACTRIS ERIC includes all functions of ACTRIS Head Office and part of the Data Centre. The statutory seat of ACTRIS ERIC is in Helsinki, Finland.

ACTRIS label – The "ACTRIS National Facility" label is granted through the ACTRIS labelling process to Observational and Exploratory Platforms that comply with the ACTRIS standards.

ACTRIS labelling process – proves the operational capacities of the National Facilities and ensures the high quality of ACTRIS data by granting the label "ACTRIS National Facility" to Observational and Exploratory Platforms that comply with the ACTRIS standards.

ACTRIS observational components - ACTRIS observational components refer to the classification of measurement techniques. ACTRIS has six observational components: aerosol in situ (AIS), cloud in situ (CIS), reactive trace gases in situ (RTGIS), aerosol remote sensing (ARS), cloud remote sensing (CRS), and reactive trace gases remote sensing (RTGRS).

Atmospheric Simulation Chamber Committee (ASCC) - supports the operation of ACTRIS atmospheric simulation chambers on matters related to procedures, quality, consistency and relevance.

Central Facility (CF) – a European-level ACTRIS component, either Head Office, Data Centre or Topical Centre, that offers ACTRIS data or research services and other services to users as well as operation support to National Facilities.

Central Facility (CF) Leader – the person responsible for leading, managing, developing and implementing the activities of a Central Facility according to the agreed ACTRIS policies and rules.

Central Facility (CF) Unit – part of a Central Facility located at and operated by a research performing organization (RPO) or by ACTRIS ERIC.

Central Facility (CF) Unit Head – the person responsible for the coordination and representation of a Central Facility Unit.

Central Facility (CF) Management Board – an internal Management Board to support the implementation of CF tasks and the daily CF operation and management. Each Central Facility (DC and TCs) has this board and it is chaired by the CF leader and includes the Head of each CF Unit.

Centre for Aerosol In Situ Measurements (CAIS ECAC) – one of the six ACTRIS Topical Centres. The European Centre for Aerosol Calibration and Characterization (ECAC) acts as the ACTRIS Centre for Aerosol In Situ measurements (CAIS), whose mission is to offer operation support to ACTRIS National Facilities operating instrumentation for aerosol in situ measurements and specialized services to a wide range of users.

Centre for Aerosol Remote Sensing (CARS) – one of the six ACTRIS Topical Centres. The mission of the CARS is to offer operation support to ACTRIS National Facilities operating aerosol remote sensing instrumentation and specialized services to a wide range of users.

Centre for Cloud In Situ Measurements (CIS) – one of the six ACTRIS Topical Centres. The mission of the CIS is to offer operational support to ACTRIS National Facilities operating instrumentation for cloud in situ measurements and specialized services to wide range of users.

Centre for Cloud Remote Sensing (CCRES) – one of the six ACTRIS Topical Centres. The mission of the CCRES is to offer operational support to ACTRIS National Facilities operating cloud remote sensing instrumentation and specialized services to a wide range of users.

Centre for Reactive Trace Gases In Situ Measurements (CiGas) – One of the six ACTRIS Topical Centres. The mission of CiGas is to offer operational support to ACTRIS National Facilities operating instrumentation for reactive trace gases in situ measurements and specialized services to a wide range of users.

Centre for Reactive Trace Gases Remote Sensing (CREGARS) – One of the six ACTRIS Topical Centres. The mission of CREGARS is to offer operational support to ACTRIS National Facilities operating reactive trace gases remote sensing instrumentation and specialized services to a wide range of users.

Cooperation Agreement – an agreement between ACTRIS ERIC and a National Facility or between ACTRIS ERIC and a Central Facility which is not included in ACTRIS ERIC.

Data Centre (DC) – the Central Facility responsible for ACTRIS data curation, preservation, and distribution of the data, value-added products and tools, and hosting the ACTRIS data portal that is a single-entry point for all ACTRIS data.

Director General (DG) – the legal representative of ACTRIS ERIC appointed by the General Assembly; responsible for the implementation of the decisions by the General Assembly and ensure the scientific and strategic development of ACTRIS.

Annex IV - Glossary

Ethical Advisory Board – consists of independent external members appointed by the General Assembly; the board provides feedback and makes recommendations to develop the ethical aspects of ACTRIS ERIC and the research infrastructure activities.

Exploratory Platform – ACTRIS National Facility; an atmospheric simulation chamber, a laboratory or a mobile platform that performs dedicated experiments and provides quality-controlled data on atmospheric compounds, processes, events or regions of relevance by following common standards.

Financial Committee – consists of expert members appointed by the General Assembly; the committee supports on matters related to the management of financial planning of ACTRIS ERIC as an advisory body of GA.

General Assembly (GA) – the governing body of ACTRIS ERIC, composed of delegates of members, permanent observers and observers.

Head Office (HO) – the Central Facility responsible for coordinating and representing ACTRIS as well as enabling ACTRIS services. HO supports the work of the General Assembly, the advisory bodies and committees of the ACTRIS ERIC.

Host country – a country where a Central Facility unit is located and operated.

Host contribution – support provided by members or permanent observers for the functioning of the Central Facilities that are not part of ACTRIS ERIC, hosted in their own country.

Host premium contribution – the support provided by ACTRIS ERIC members and permanent observers for the functioning of the Central Facilities that are part of ACTRIS ERIC, hosted in their own country.

In situ measurements – in the context of ACTRIS, in situ measurements of aerosol, cloud, and reactive-trace-gas properties refer to techniques that characterise a sampling point. They can be performed from Observational Platform near the surface, from mobile surface-based or airborne platforms, and in atmospheric simulation chambers and laboratories. ACTRIS has three in situ observational components (AIS, CIS, RTGIS).

ACTRIS Scientific Advisor – an expert appointed by the Director General to advise ACTRIS on scientific matters, supporting the development and advancement of ACTRIS research and services.

Member of ACTRIS ERIC – a Member State of the European Union, associated country, third country other than associated country, or an intergovernmental organization that has joined ACTRIS ERIC. The rules of ACTRIS membership and obligations and rights of members are defined in the ACTRIS ERIC statutes.

Membership contribution – a cash contribution to ACTRIS ERIC to be collected from a member, permanent observer or observer according to the rules defined in the ACTRIS Internal Financial Rules. ACTRIS ERIC is responsible for allocating the agreed contributions to each Central Facility.

National Contact Person (NCP) – a person nominated by the countries that have shown their commitment to ACTRIS at organizational or state level. The ACTRIS National Contact Person is responsible for organizing the coordination of the ACTRIS community at the national level and is responsible for ensuring the proper dissemination and information flow from the European ACTRIS activities to the national science communities and the relevant national stakeholders.

National Facility (NF) – an observational or exploratory platform which has a contractual relationship with ACTRIS ERIC and which provides data and/or physical/remote access to its premises. National Facilities are developed, managed and operated by national Research Performing Organisations.

National Facility Principal Investigator (NF PI) – The scientist in charge of the measurements performed at a National Facility, usually also the contact person of the facility.

National Facility (NF) Technical and Scientific Forum – a highly technical and operative forum to develop the RI and ensure the connection of scientific expertise and technological development. It as an advisory body that may provide recommendations to the RI Committee or to the ACTRIS community. The forum is inclusive; the forum is open for the whole ACTRIS community and ACTRIS users.

Observational Platform – ACTRIS National Facility; a fixed ground-based station acquiring reliable high-quality data on the variability of aerosol, clouds and trace gases and their complex interactions by applying standardized remote sensing and in situ measurement techniques. Observational Platforms may also provide physical and/or remote access to users.

Observer of ACTRIS ERIC – a Member State of the European Union, associated country, third country other than associated country, or an intergovernmental organisation that has joined ACTRIS ERIC as an observer or permanent observer. The rules of ACTRIS observership and obligations and rights of observers are defined in the ACTRIS ERIC statutes.

Physical access – physical access to an ACTRIS Central Facility or National Facility. Centrally managed via the ACTRIS Head Office's Service and Access Management Unit, following the ACTRIS Access and Service Policy.

Remote access – access to an ACTRIS Central Facility or National Facility without users physically visiting the facility.

Remote sensing measurements – in the context of ACTRIS, remote sensing measurements refer to active and passive atmospheric remote-sensing techniques for the observation of aerosol, clouds, and trace gases. They can be applied at observational sites and on mobile surfacebased platforms. ACTRIS has three remote sensing observational components (ARS, CRS, RTGRS).

Research Infrastructure Committee (RI Committee) – the committee supports the Director General on matters related to the Research Infrastructure to ensure consistency, coherence, and sustainability of the operations of the Research Infrastructure.

Annex IV - Glossary

The RI Committee is convened by the Director General and shall have representatives both from the Central Facilities and National Facilities.

Scientific and Innovation Advisory Board (SIAB) – consists of independent external members appointed by the General Assembly; the board monitors the scientific and operative quality of ACTRIS and advises to development of ACTRIS ERIC and the research infrastructure activities in the operation phase.

Science and User Access Forum – a focused space dedicated to all matters related to the physical and remote access of users to ACTRIS services and for users to interact with ACTRIS.

Service and Access Management Unit (SAMU) – a Unit of ACTRIS Head Office facilitating the access to ACTRIS services.

Topical Centre (TC) – a Central Facility supporting the operation of the National Facilities and offering services and operation support for quality assurance and quality control of ACTRIS measurements and data (including training and knowledge transfer, calibration, quality assurance/quality control tools, and development of standard operation and evaluation procedures).

Six Topical Centres are set up to respond to the scientific and technical needs of ACTRIS, each with a particular focus on either remote sensing (from the ground) or in situ (near-surface) measurements:

- **CAIS-ECAC** – Centre for Aerosol In Situ Measurements – European Centre for Aerosol Calibration and Characterization
- **CARS** – Centre for Aerosol Remote Sensing
- **CIS** – Centre for Cloud In Situ Measurements
- **CCRES** – Centre for Cloud Remote Sensing
- **CiGas** – Centre for Reactive Trace Gases In Situ Measurements
- **CREGARS** – Centre for Reactive Trace Gases Remote Sensing

User – a person, a team, or an institution making use of ACTRIS data or other ACTRIS services, including access to ACTRIS facilities.

Virtual access – wide and free access to ACTRIS data and digital tools provided by DC through the ACTRIS website.

ACTRIS data and service specific glossary

ACTRIS data levels:

- **level 0 data:** Raw sensor output. Native resolution, metadata necessary for next level.
- **level 1 data**: Calibrated and quality assured data with minimum level of quality control.
- **level 2 data:** Approved and fully quality controlled ACTRIS data product or geophysical variable.
- **level 3 data:** Elaborated ACTRIS data products derived by post-processing of ACTRIS Level 0 -1 -2 data, and data from other sources. The data can be gridded or not.

Data curation – the activity that stores, manages and ensures access to all persistent data sets produced within the infrastructure.

Data originator – entity operating instruments at a National Facility or Topical Centre, resulting in ACTRIS data and delivering ACTRIS data to the Data Centre.

Data provider – the Data Centre offering the ACTRIS data and value-added data products and tools to users.

Digital tools – tailored codes and software for processing and visualization of ACTRIS data, production of ACTRIS data products, and for data analysis and research.

Data traceability – an unbroken chain of uniquely identified process steps leading from raw data to any kind of processed data, where identification of process steps follows the data.

Measurement traceability – an unbroken chain of comparisons relating an instrument's measurements to a known standard, in the ideal case SI units.

Quality assurance and control – quality assurance is process-oriented and focuses on defect prevention and quality control is product-oriented and focuses on defect identification:

- Quality Assurance (QA) – the process or set of processes used to ensure the quality of a product (e.g. data series, instrument, sample, measured value of a variable, etc.).
- Quality Control (QC) – the process and activities of ensuring products and services meet the expectations.

Synthesis product – data product not under direct ACTRIS responsibility from e.g. research activities, citizen science, for which ACTRIS offers repository and access.

Variables – almost 135 different atmospheric variables are measured within ACTRIS. The variables are listed in the ACTRIS data management plan.

Annex V - 2024 Delegates of the ACTRIS ERIC General Assembly

Country	Name
Austria	Karolina Begusch-Pfefferkorn
Belgium	Aline van der Werf; Verreet Gert
Bulgaria	Kalin Mutavchiev; Tanja Dreischuh
Czech Republic	Zdimal Vladimir; Jan Svehla
Cyprus	Michalis Mouskos; Chrysanthos Savvides
Denmark	Mads Rugaard Christensen
Finland	Petteri Kauppinen; Hannele Korhonen
France	Jean Marie Flaud; Jérôme Rose
Germany	Jonas Esche; Jochen Elberskirch
Italy	Mauro Bertelletti; Gelsomina Pappalardo
Netherlands	Arnoud Apituley
Norway	Odd Ivar Eriksen
Poland	Michał Rybiński; Iwona Stachlewska
Romania	Viorel Vulturescu; Beatrice Păduroiu
Spain	María Vallejo Abascal
Sweden	Sara Moa; Ulf Jonsell
Switzerland	Maarten Lupker

Annex VI - Scientific and Innovation Advisory Board

Name	Affiliation
Leonard Barrie (SIAB Chair)	McGill University, Stockholm University, The Cyprus Institute
Valérie Thouret	European Research Infrastructure In-service Aircraft for Global Observing System (IAGOS-AISBL)
Øystein Hov	The Norwegian Academy of Science and Letters
Vincent-Henri Peuch	Copernicus Atmosphere Monitoring Service (CAMS), European Centre for Medium-Range Weather Forecasts (ECMWF)
Carlo Rizzuto	CERIC-ERIC (Central European Research Infrastructure Consortium)
Oksana Tarasova	World Meteorological Organization (WMO)

Annex VII - Projects

Logo	Name	Period	Website
ACTRIS | Germany	ACTRIS-D	2021-2026	https://www.tropos.de/en/research/actris-d
ACTRIS | Norway	ACTRIS-Norway	2022-2026	https://actris.no/
	AeroPan	2022-2026	https://www.igf.fuw.edu.pl/en/projects/186/
AIRSENSE	AIRSENSE	2023-2024	https://www.grasp-earth.com/portfolio/airsense/
ATMO ACCESS Access to Atmospheric Research Facilities	ATMO-ACCESS	2021-2025	https://www.atmo-access.eu
Atmosphere Monitoring Service ECMWF	CAMS2_ 21a	2023-2026	Near-Real-Time provision of aerosol and reactive species from ACTRIS and EMEP surface observation networks
Atmosphere Monitoring Service ECMWF	CAMS2_21b	2023-2026	https://ciao.imaa.cnr.it/research/projects/cams-21b/
Atmosphere Monitoring Service ECMWF	CAMS2_27_BIRA-IASB	2022-2027	https://atmosphere.copernicus.eu/provision-improved-access-ndacc-observations
CARGO ACT	CARGO-ACT	2024-2027	https://www.cargo-act.eu
CERTAINTY CLOUD-AEROSOL INTERACTIONS & THEIR IMPACTS IN THE EARTH SYSTEM	CERTAINTY	2024-2028	https://certainty-aci.eu
CleanCloud	CleanCloud	2024-2027	https://projects.au.dk/cleancloud
ESA | JAXA earthcare	EarthCARE	Launched in 2024	https://earth.esa.int/eogateway/missions/earthcare

Annex VII - Projects - Ongoing

Logo	Acronym	Period	Website
	ENVRIhub-NEXT	2024-2027	https://envri.eu/envri-hub-next/
	ENVRINNOV	2024-2027	https://envri.eu/envrinnov/
	FORCeS	2024-2028	https://eu-polarin.eu
	FRM4DOAS	2021-2025	https://frm4doas.aeronomie.be
	HARMONIA	2022-2026	https://harmonia-cost.eu
	IRISCC	2024-2028	https://www.iriscc.eu
	ITINERIS	2022-2025	https://itineris.cnr.it
	Mi-TRAP	2024-2027	https://mitrap-project.eu/
	Net4Cities	2024-2027	https://www.net4cities.eu
	OBS4CLIM	2021-2029	https://www.obs4clim.fr
	Pangea4CalVal	2024-2027	https://pangea4calval.space.noa.gr
	PAREMPI	2023-2025	https://parempi.eu
	POLARIN	2024-2028	https://eu-polarin.eu
	RI-URBANS	2021-2025	https://riurbans.eu
	VILMA	2022-2029	https://www.helsinki.fi/en/researchgroups/vilma

Annex VIII - List of reported Peer-Reviewed Publications in 2024

- Aas, W., Fagerli, H., Alastuey, A., Cavalli, F., Degorska, A., Feigenspan, S., Brenna, H., Gliß, J., Heinesen, D., Hueglin, C., Holubová, A., Jaffrezo, J.L., Mortier, A., Murovec, M., Putaud, J.P., Rüdige, J., Simpson, D., Solberg, S., Tsyro, S., Tørseth, K., Yttri, K.E., 2024: Trends in Air Pollution in Europe, 2000–2019. Aerosol Air Qual. Res. https://doi.org/10.4209/aaqr.230237.
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Annex VIII - List of reported Peer-Reviewed Publications in 2024

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Annex VIII - List of reported Peer-Reviewed Publications in 2024

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Annex VIII - List of reported Peer-Reviewed Publications in 2024

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Annex VIII - List of reported Peer-Reviewed Publications in 2024

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Annex VIII - List of reported Peer-Reviewed Publications in 2024

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