ACTRiS

The Aerosol, Clouds and Trace Gases Research Infrastructure

Open for **Science**

Open for **Innovation**

A large European-wide community

22 countries committed at organizational or state level

100+ research performing organizations are involved in the ACTRIS community

What is ACTRIS?

ACTRIS helps us respond to the grand challenges faced by our society by enabling a deeper understanding of atmospheric processes.

The Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS) is a pan-European research infrastructure producing high-quality data and information on short-lived atmospheric constituents and hon the processes leading to the variability of these constituents in natural and controlled atmospheres.
ACTRIS enables free-access to high-class long-term atmospheric data through a single entry point. We offer access to our world-class facilities providing researches, from academia as well as from the private sector, with the best research environments and expertise promoting cutting-edge science and international collaborations.

ACTRIS is key to supporting scientific advances in the field of atmospheric research: fundamental understanding of atmospheric physical and chemical processes together with advances in theory, modelling, and observations is vital in narrowing gaps in the predictive capability of simulation models from the local to the global scale.
ACTRIS activities contribute to reduce uncertainties in emission sources, to understand deposition processes that remove short-lived constituents from the atmosphere, and to quantify their potential impacts on ecosystems.

Our Framework

Our vision: ACTRIS is the fundamental European research infrastructure for short-lived atmospheric constituents, increasing excellence in Earth system observation and research, and providing information and knowledge for developing sustainable solutions to societal needs.

Our mission: ACTRIS shall establish, operate, and develop a pan-European distributed research infrastructure for short-lived atmospheric constituents. ACTRIS shall provide effective access for a wide user community to its resources and services in order to facilitate high-quality Earth system research.

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

Technologic advancements through partnerships and tailored services

Our Services

We provide access to a large variety of high-quality services to a wide range of users and needs, for scientific, technological and innovation-oriented usage.

ACTRIS instrumented facilities and services are key to supporting scientific advances in the field of atmospheric research. Our observations deliver unique information on short-lived climate forcers with the required level of precision, coherence and integration essential for their use in forecast models, satellite validation. By using ACTRIS data, our users can deepen their understanding of atmospheric physical and chemical processes.

We enable our users to conduct reliable research by accessing ACTRIS world-class facilities and by taking advantage of our extensive catalogue of services. With ACTRIS services, private sector users can explore possibilities of developing new products and innovative services thanks to qualified support to advance their knowledge-based activities and enable pre-competitive and pre-commercial

Virtual access to data services and digital tools

Data services related to ACTRIS data, data products, and digital tools include:

- Access to long-term, quality controlled ACTRIS measurements data from both observational and exploratory platforms, data products, and digital tools, through a single entry point, comprising raw data, automatic calibrated and quality-assured data
- Meta data associated to the data products documenting data, data traceability and data flow, citation service, and data attribution, including version control
- Data curation service for campaigns and dedicated research projects and initiatives, external or internal to ACTRIS.

Physical and remote access to services and resources

Research services
Access to our state-of-the-art facilities

Technical services
QA/QC procedures - calibration - testing -intercomparison - retrieval methodologies

Innovation services
Market oriented applications - instrument synergies- novelty technology development

Training services
Best practices - knowledge transfer - networking - synergetic scientific community

Tailored services
On-request customized research and technical services

Open access to ACTRIS

ACTRIS offers virtual, physical and remote access to ACTRIS resources and services:

- **Virtual Access** to high quality, harmonized and documented ACTRIS data from observational and exploratory National Facilities, data products and digital tools, provided by the Data Centre
- **Physical and Remote Access** to Technical / Research / Innovation / Training services provided by the ACTRIS Central and National facilities

Virtual Access is wide and free, and does not require a selection process because the resources can be simultaneously used by an unlimited number of users.

Find more on ACTRIS Data Policy

Physical or Remote access is competitive access to services or resources of the ACTRIS Facilities, which are not unlimited, depend on the facilities' availability and require a competitive process to select users following defined procedures and criteria. The Service and Access Management Unit (SAMU) of the ACTRIS Head Office manages the entire access process, with the selection of users based on:

- the scientific excellence of the research project (excellence-driven access)
- technical needs to increase performance & quality of research (technical need-driven access)
- innovation and market considerations (market-driven access)

Find more on the ACTRIS Access and Service Policy

Find detailed information on the application procedure for access at: www.actris.eu/access-services

ACTRIS Data

Open for Science

We offer a comprehensive measurement programme at the forefront of the advancement of research in the specific domains covered within ACTRIS (vertical aerosol distribution, in-situ aerosol properties, trace gases, cloud-aerosol observations) together with state-of-the-art equipment, high level of services, and capacity to provide research-driven training to new users and expert professionals.

ACTRIS Facilities
Open for Science

to all users from anywhere in the world to conduct a scientific project

Project:	**ACTRIS-2**	**EUROCHAMP-2020**
# users:	**371** **111 women** **260 men**	**245** **91 women** **154 men**
# proposals	**136** **10% from private sector**	**88** **8% from private sector**

ACTRIS offers free of charge access to 11 facilities for:

- Comprehensive measurement programmes using state-of-the art equipment and expertise within any of the ACTRIS domain
- Scientific measurement campaigns, calibration and intercomparisons, instrument testing, data analysis
- High level of services and support to users incl. training to new users and professional experts

The access is inclusive of:

- **Free trans-national access** to and use of the platform, data from permanent instruments, workspace to bring and use own equipment (according to lcoal procedure and safety regulations)
- **Scientific and technical support** (e.g., preparatory work and installation, specific training, planning, etc.)
- **Administrative and logistic support** (available on request only)

Calls for proposals are published regularly and available here. Proposal are accepted for submission at any time by any eligible user or user group during the publication of the call and before the call deadline.
The best projects will be selected by peer review through an independent and international panel of experts based on

- scientific excellence
- technical need-drived criteria

Find details on the application procedure here

In exchange for the free access, users are required to publish the results of the experiments with appropriate references to the ACTRIS facilities and to the local scientific and technical staff involved.

Read the ACTRIS Service and Access Policy

Aerosol remote sensing data centre unit

ACTRIS DC- ARES

Location: Tito Scalo, Potenza, Italy

Website: www.ciao.imaa.cnr.it/

ACTRIS DC-ARES, operated by CNR, is the main responsible for the Single calculus cHain for Aerosol Remote sEnsing (SHARE), the centralized processing suite for the processing of aerosol lidar data. The Single Calculus Chain (SCC) is currently used by some of the EARLINET/ACTRIS stations and it will become mandatory for the retrieval of ACTRIS aerosol profiling data in the operational phase.

The facility provides support in setting up SCC for the stations, configuring it, interpreting the results, but also through web forum, documentation and schools. Based on this unique expertise in the aerosol lidar processing, it offers the SCC use to external users for fostering international cooperation and standardization.

Centre for Aerosol Remote-Sensing Automatic Sun/Sky/Lunar Phtometer

CARS-ASP-FR

Location: Lille, France

Website: www-loa.univ-lille1.fr/photons

The infrastructure consists of photometry and radiometry calibration platforms for calibration of field instruments and the infrastructure holds a mobile platform simulator that allows to test instruments dedicated to mobile observations. The facility contributes to the ground-based standardized automatic sun/sky-photometer network AERONET and complements the US NASA calibration centre.

CARS-ASP-FR offer two types of services: (i) calibration and maintenance for sun/sky/lunar/polar photometers; and (ii) services dedicated to mobile photometry for users willing to upgrade their photometer for mobile (e.g., maritime) observation capabilities.

Central Data Processing Systems for FTIR remote sensing data

CDPS-FTIR

Location: Brussels, Belgium

Website: www.aeronomie.be/

CDPS-FTIR is a processing system running on HPC infrastructure for processing remote sensing FTIR level 1 data (spectra) to level 2 data (geophysical products, i.e., total column abundances and in some cases vertical concentration profiles of ACTRIS target reactive gases).

Preliminary CDPS-FTIR services have already been set up in the frame of Copernicus Atmosphere Monitoring Service (CAMS) projects. This includes central processing of all in-house measurements and of some collaborating stations. Tests with a preliminary CDPS-FTIR version have enabled users to contribute to the CAMS-84 project and resulted in several research papers. CDPS-FTIR is also of interest for new instrumental developments.

Station for Measuring Ecosystem-Atmosphere Relations II

SMEAR II

Location: Hyytiälä, Juupajoki, Finland

Website: www.helsinki.fi/hyytiala-forestry-field-station

SMEAR II represents background boreal forest site consisting of main site at scots pine forest and additional flux measurements in wetland fen and boreal lake environments. The site is a world-renowned site for cutting edge aerosol science, multidisciplinary research and having one of the longest time series of atmospheric data (over 20 years).

SMEAR II is operational 24/7, year-round. On-site accommodation and support is in place and open access to comprehensive multidisciplinary SMEAR II data is available. Technical help and instrument monitoring and maintenance for observations during extended periods, research planning and training are provided. It provied users with installation, operation and maintenance of guest instrumentation, virtual training opportunities, instrument benchmarking, field calibrations for selected instrumentation.

High Altitude Research Station Jungfraujoch

JFJ

Location: Jungfraujoch, Switzerland

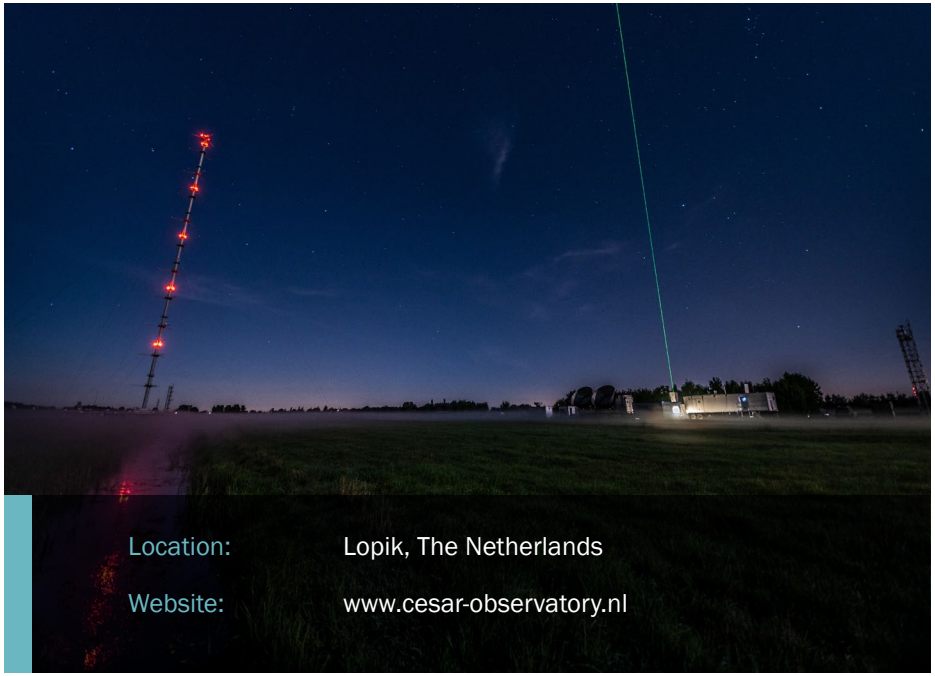
Website: www.hfsjg.ch/jungfraujoch

The highest research station in Europe that is accessible all year round by rail, JFJ is the only easily accessible observation point in Europe with adequate infrastructure that is within the free troposphere most of the year. The research station JFJ is therefore of utmost importance for ground-based observations of the free troposphere.

As the research observatory is within clouds 40% of the time throughout the year, it provides a unique opportunity for in situ studies of liquid clouds (in summer) and mixed-phase and glaciated clouds (in winter). Physical access is offered to a broad variety of atmospheric scientists. Examples of activities comprise closure of organic species in the gas and aerosol phase (links to EUROCHAMP and various CFs), characterization of black carbon, investigation of vertical transport processes, or aerosol-cloud interactions. Testing of newly developed instruments by companies will be supported by cutting-edge complementary instrumentation.

Cabaw Experimental Site for Atmospheric Research

Cabauw



Location: Lopik, The Netherlands

Website: www.cesar-observatory.nl

The infrastructure is designed to study the physical and chemical atmosphere and its interaction with the land surface. The 213 m high Cabauw tower was built in 1972 for meteorological research to study the state of the atmospheric boundary layer linked to land surface conditions.

Cabauw provides access to users for i) Cloud remote sensing – hands on capacity training, developing and testing new technologies and/or scientific exploration (in particular cloud calibration), ii) aerosol remote sensing equipment (state of the art (Raman) lidar techniques), and iii) mobile trace gas instruments, iv) installation of instruments by users and access to the equipment via remote access, and v) maintenance of user instrumentation by local personnel.

Sonnblick Observatory

SBO

Location: Mt. Hoher Sonnblick, Austria

Website: www.sonnblick.net

Established in 1886 and is surrounded by glaciers and permafrost, SBO today is a station of interdisciplinary research covering the atmosphere, cryosphere, biosphere, lithosphere and the hydrosphere.

SBO provides a platform for temporary installation of scientific instrumentation to users, testing instruments, measuring campaigns, dedicated cloud in situ training and workshops. CDPS-FTIR is also of interest for new instrumental developments,e.g.,by a commercial company, which may require verification of the data that CDPS-FTIR can be provide.

Unmanned System Research Laboratory

USRL

Location: Nicosia, Cyprus (Workshop)Orounda, Cyprus (airfield)

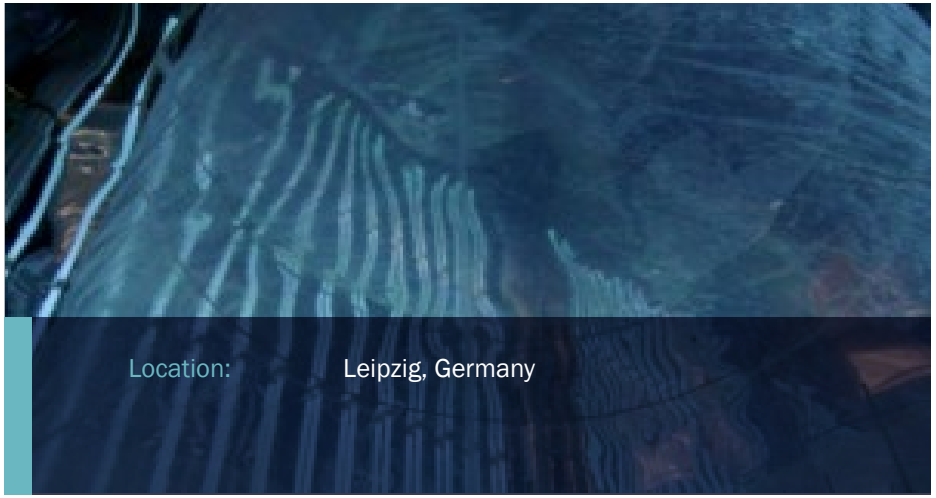
Website: http://usrl.cyi.ac.cy/

USRL focuses on cost-effective Unmanned Aerial Vehicles, atmospheric applications (vertical profiling, 3D mapping, plume tracking) with miniaturized and lightweight atmospheric sensors fulfilling ACTRIS QA/QC and SOPs. It comprises laboratories (150m^2) with weather chamber for sensor qualification, specialised mechanical/electronic workshops, as well as a private airfield and permanent airspace (up to 3km altitude).

USRL provides 1) research support in performing intensive field campaigns (profiling, 3D mapping) of UAV-sensor systems, 2) technical support through customized integration of lightweight sensors into UAVs (multi-copter, fixed wing), 3) innovation support through the optimization of lightweight instrumentation for their specific use onboard UAVs, 4) quality UAV training of new users (pilots and scientists).

Atmospheric Chemistry Department - Chamber combined with the Organic Tracers and Aerosol Constituents - Calibration Centre

ACD-C/OGTAC CC



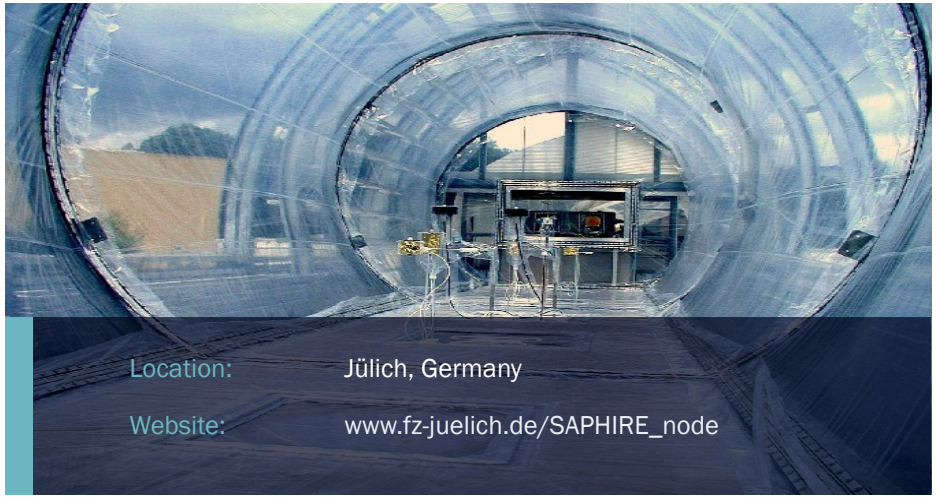
Location: Leipzig, Germany

ACD-C/OGTAC uniquely combines chamber and state-of-the-art online and offline measurement techniques. ACD-C is a twin chamber with a broad variety of online and offline instrumentation, including two SMPS, PTR-TOFMS, PTR-QMS, two CAPS, two sub-ppb level NO2 analysers, an AMS, a CI-APi-TOFMS to comprehensively characterize a wide variety of chamber processes.

Good chamber practice, hands-on training in online and offline instrumentation relevant for chamber experiments and comprehensive data analysis are a fixed part of the services offered.
The chamber is attractive for toxicologists, biologists, as well as for health and biodiversity studies. ACD-C strongly cooperates with SMEs like Ionicon for PTR-TOFMS technology and Aerodyne for CI-API-TOFMS.

Simulation of Atmospheric Photochemistry in a large Reaction Chamber in combination with Centree for Reactive Trace Gases In-Situ Measurements

SAPHIR-CiGas-FZJ



Location: Jülich, Germany

Website: www.fz-juelich.de/SAPHIRE_node

SAPHIR provides a platform for reproducible studies of the atmospheric degradation of biogenic and anthropogenic trace gases and the build-up of secondary particles and pollutants. It is equipped with a comprehensive, unique set of sensitive instruments for radicals (OH, HO2, RO2, NO3), traces gases (NOx, N2O5, O3, HONO, OH reactivity, VOC, OVOC), aerosols, and physical parameters.

The provided services include SAPHIR chamber studies, hands-on training activities on NOx instrumentation, side by side inter-comparisons to reference methods, overarching instrument inter-comparisons, investigation of possible interferences by tuneable atmospheric matrices, and data quality workshops.

Atmospheric simulation chamber - European PhotoREactor

EUPHORE

Location: Paterna, Valencia, Spain

Website: www.euphore.es

EUPHORE is an installation with two twin outdoor simulation chambers. Its characteristics allow the study of atmospheric behaviour of biogenic and anthropogenic VOCs, formation of ozone and aerosols under near-real conditions thanks to its large size (200 m3 each) and the use of natural light.

Scientific services comprise the study of atmospheric behaviour of biogenic and anthropogenic VOCs and semi-VOCs, formation of O3, aerosols and secondary products (determination of life times in air, and degradation products) and validation of photochemical models. Technical services include intercomparison of instrumentation with possibility of accommodating a large number of external instruments, and the use of the chamber to test, develop or improve new instruments or technological solutions.

The number of ACTRIS Facilities open to transnational access will increase as our Research Infrastructure solidifies.

Our users will have even a wider variety of Facilities to conduct advanced research and development!

ACTRiS

Exploring the Atmosphere

Fostering excellence in **atmospheric** and **Earth System Research**

supporting users from all over the world towards research-based and technological breakthroughs

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