Consiglio Nazionale delle Ricerche
imaa istituto di metodologie per l'analisi ambientale

List of ACTRIS Services available for transnational access (TNA) under the EU projects ATMO-ACCESS and ACTRIS IMP

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1 Introduction

This document provides the list of services available for transnational access (TNA) to the Central and National Facilities of the Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS). The Service and Access Management Unit (SAMU) of the ACTRIS Head Office, operated by the CNR–IMAA, prepared the list to organize the service provision in TNA mode in the frame of various projects supporting access to facilities (like ATMO-ACCESS, H2020-INFRAIA-2020-3, Grant Agreement number 101008004; ACTRIS IMP, H2020-INFRADEV-2016-2017, Grant Agreement number: 739530).

This document, which is a prelude and first step in the organization of the ACTRIS offer for excellent science, includes detailed descriptions of the various TNA services contributing to the RI's catalog of services. The list is not exhaustive as the inventory of TNA providers is open to new inclusions and, above all, because access providers are defining, refining, and implementing services in an ongoing development process that is fostered and supported by the said projects.

The facilities offering transnational access are representative for their uniqueness within Europe, offering 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 young scientists and new users.

The document is structured in 6 sections. After this introduction, section 2 provides the overall list of services available for TNA.
Sections 3-4-5-6 present respectively the available detailed descriptions of services provided by the ACTRIS National Facilities, both Observational Platforms and the Exploratory Platforms (Simulation Chambers, Mobile Platforms and Laboratories), and the Central Facilities.

2 List of ACTRIS services available via TNA

Facility type	FACILITY (short name)	LOCATION	SERVICE NAME	TYPE OF SERVICE	TYPE OF ACCESS
Obs.	AGORA	Spain, Granada	Campaigns for Aerosol-Cloud Interaction Research	Research service	Physical, remote
Obs.	AGORA	Spain, Granada	Experiments for Aerosol-Cloud Interaction Research	Research service	Physical, remote
Obs.	AGORA	Spain, Granada	Instrument Testing and Intercomparison Campaigns	Research service	Physical
Obs.	AGORA	Spain, Granada	Young Scientists Training	Training service	Physical, remote
Obs.	AGORA	Spain, Granada	Training for Companies	Training service	Physical
Obs.	AGORA	Spain, Granada	Support to private innovation	Technical service	Physical
Obs.	ATMOS	Athens, Greece	Access to services of the AThens MOnitoring Supersite	Research service / Technical service	Physical
Obs.	BCN	Barcelona, Spain	Access to services of the BCN Atmospheric Research network	Research service / Technical service	Physical, remote
Obs.	CAO	Agia Marina Xyliatou, Cyprus	Access to services of the Cyprus Atmospheric Observatory	Research service / Technical service	Physical
Obs.	CESAR	Lopik, the Netherlands	Methane stable isotope analysis (δ^{13}C-CH_4, δD-CH_4)	Research service / Technical service	Remote
Obs.	CESAR	Lopik, the Netherlands	Methane clumped isotope analysis (Δ^{13}C-D-CH_4, Δ-D-D-CH_4)	Research service / Technical service	Remote
Obs.	CESAR	Lopik, the Netherlands	Carbon monoxide stable isotope analysis (δ^{13}C-CO, δ^{18}O-CO)	Research service / Technical service	Remote
Obs.	CESAR	Lopik, the Netherlands	Hydrogen stable isotope analysis (δD-H_2)	Research service / Technical service	Remote
Obs.	CESAR	Lopik, the Netherlands	In-situ, column integrated, vertical profiling and spatial atmospheric observations	Data, research, technical, innovation, training service	Physical, remote
Obs.	CESAR	Lopik, the Netherlands	Cloud radar calibration	Research, Technical service, Training	Physical

Obs.	CESAR	Lopik, the Netherlands	Trace gas remote sensing intercomparison	Research, Technical service, Training	Physical
Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Training on lidar data analysis, SCC and on technical aspects of lidar systems	Research service / Technical service/Training	Physical, remote
Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Intercomparison of lidar systems at CIAO	Research service / Technical service	Physical
Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Access and integration of data using different active, passive and in-situ instruments at CIAO	Research service	Physical, remote
Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Laboratory characterization of instruments and blocks	Research service / Technical service/Training	Physical
Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Testing and building lidar configurations	Research service / Technical service	Physical
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena)	Calibration of chemioluminescence NOx analyers at CMN-PV	Technical service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena)	Calibration of ozone analysers	Technical service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Bologna	Calibration of ozone analysers	Technical service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, S. Pietro Capofiume (Bologna)	DOAS measurement facility	Research service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Bologna	Calibration of chemioluminescence analyers at CMN-PV	Technical service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena)	In-situ intercomparison for near-surface gas and aerosol analysers	Research service / Technical service	Physical, remote
Obs.	Monte Cimone - Po	CNR-ISAC, Italy, Bologna	In-situ intercomparison for near-surface gas and aerosol analysers	Research service / Technical service	Physical, remote

	Valley (CMN-PV)				
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, S. Pietro Capofiume (Bologna)	In-situ intercomparison for near-surface gas and aerosol analysers	Research service / Technical service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena)	Analysis of atmospheric process by in-situ "near-surface" observations at a high mountain site	Research service / Training service / Data service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Bologna	Analysis of atmospheric process by in-situ "near-surface" observations at an urban site	Research service / Training service / Data service	Physical, remote
Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, S. Pietro Capofiume (Bologna)	Analysis of atmospheric process by in-situ "near-surface" observations at a rural site	Research service / Training service / Data service	Physical, remote
Obs.	CO-PDD	Clermont-Ferrand, France	Access to services of the Cézeaux-Aulnat Opme Puy de Dôme station	Research service / Technical service	Physical
Obs.	EVASO	Evora, Portugal	Access to services of the Evora Atmospheric Science Observatory	Research service / Technical service	Physical
Obs.	FKL	Finokalia, Crete, Greece	Access to services of the Finokalia station	Research service / Technical service	Physical
Obs.	FMI PAL-SOD	Muonio, Finland	Access to services of the Pallas-Sodankylä Atmosphere-Ecosystem Supersite	Research service / Technical service	Physical
Obs.	HTM	Forest in southern Sweden	Access to services of the HTM station	Research service / Training service	Physical, remote
Obs.	ISAF - Izaña Observatory (IZO)	Spain, Izaña (Tenerife)	ISAF-Cal Calibration and intercomparison of photometers at IZO	Research, training, technical development	Physical, remote
Obs.	ISAF- Izaña Observatory (IZO)	Spain, Izaña (Tenerife)	ISAF-Obs Atmospheric observations in free-troposphere conditions at IZO	Research, campaigns, intercomparison	Physical (once installed also remote)
Obs.	JFJ	Jungfraujoch, Switzerland	Access to services of the JFJ station	Research service / Technical service	Physical

Obs.	Melpitz	Germany, Melpitz	Aerosol physico-chemical properties (ground and vertical)	Data, research, technological, innovation, training service	Physical, remote
Obs.	NAOK	Košetice, Czech Republic	Access to services of the National Atmospheric Observatory Košetice	Research service / Technical service	Physical
Obs.	OPAR	La Réunion, France	Access to services of the Observatoire de Physique de l'Atmosphère à La Réunion	Research service / Technical service	Physical
Obs.	RADO	Magurele, Romania	Aerosol-clouds-radiation studies	Research service	Physical, remote
Obs.	RADO	Magurele, Romania	Cal/Val campaigns in support of satellite atmospheric missions	Research Service	Physical, remote
Obs.	RADO	Magurele, Romania	Training	Training service	Physical, remote
Obs.	RADO	Magurele, Romania	Deployment of mobile reference aerosol Lidar for short-term campaigns	Technical service	Physical
Obs.	RADO	Magurele, Romania	Testing of aerosol Lidar prototypes	Technical service	Physical, remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Intercomparison of instruments for cloud in situ, LWC	Technical service	Physical, remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Sampling support	Technical service	Physical, remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Instrument operation	Technical service	Physical, remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Training	research	physical
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Cable car profiles	Technical service	Physical, remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Data analysis and preparation	data, research	remote

Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Regional to global backwards modelling with ECMWF-FLEXPART model	Data, research service	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Time-series of atmospheric boundary layer heights derived from ceilometer observations	Data, research	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Measurement of boundary layer wind and turbulence profiles	Technical service, data, research	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Specific weather forecast for Mt. Hoher Sonnblick	Information service	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Climate scenarios for Mt. Hoher Sonnblick	Information service	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Meteorological consulting	Information service	remote
Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Avalanche advice and avalanche warning service	Information service	remote
Obs.	SIRTA	Plateau de Saclay, France	Access to services of the SIRTA - Site Instrumental de Recherche par Télédétection Atmosphérique	Research service / Technical service	Physical, remote
Obs.	SMEAR II	Juupajoki, Finland	Scientific services for cutting edge aerosol/trace gases and clouds science of the Station for Measuring Ecosystem - Atmosphere Relations II	Research service / Technical service	Physical, remote
Obs.	WOS	Warsaw, Poland	Access to services of the Warsaw Observatory Station	Research service / Technical service	Physical, remote
Sim. Chamber	**ACD-C** / LACIS-T	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	1) Training on state of the art offline and online analytical instrumentation 2) Training on good chamber practice	Training service	Physical
Sim. Chamber	**ACD-C** / LACIS-T	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Scientific research on tropospheric multiphase processes under controlled chamber conditions	Research service	Physical

Sim. Chamber	**ACD-C** / LACIS-T	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Newly developed instrumentation testing, (inter)calibrations and intercomparisons	Innovation service	Physical
Sim. Chamber	**ACD-C** / LACIS-T	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Support for instrument (innovation) development	Technological service	Physical
Sim. Chamber	ACD-C / **LACIS-T**	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Scientific research on cloud-microphysics - turbulence interaction	Research service	Physical
Sim. Chamber	ACD-C / **LACIS-T**	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Testing of (new) instrumentation, and instrument intercomparisons under turbulent conditions	Technical and innovation service	Physical
Sim. Chamber	ACD-C / **LACIS-T**	Germany, Leipzig, at TROPOS 51.35°N, 12.43°E, 120 m a.s.l.	Training on LACIS-T including state-of-the-art instrumentation	Training service	Physical
Sim. Chamber	AIDA	Karlsruhe, Germany	Scientific exploration at the AIDA atmospheric simulation chamber	Research service	Physical
Sim. Chamber	AURA	Aaarhus University, Langelandsgade 140, DK-8000 Aarhus	Experiments in Atmospheric Simulation Chamber	Research service	Mainly physical
Sim. Chamber	CESAM	Créteil, France	Scientific exploration at the CESAM atmospheric simulation chamber	Research service	Physical
Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Bioaerosol characterization	Research service, technical service, innovation	Physical, remote
Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Testing and characterization of bioaerosol monitors/sensors	Research service, technical service, innovation	Physical, remote
Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Measurement of aerosol optical properties	Research service, technical service, innovation	Physical, remote
Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Testing of samplers and gas/aerosol monitors	Research service, technical service, innovation	Physical, remote

Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Design, organization and execution of custom experiments	Research service, technical service, innovation	Physical, remote
Sim. Chamber	ESC-Q-UAIC	Iași, Romania	Scientific exploration at the ESC-Q-UAIC environmental simulation chamber	Research service	Physical
Sim. Chamber	EUPHORE	Paterna, Spain	Scientific research at the EUPHORE atmospheric simulation chamber	Research service	Physical (preferred) remote access
Sim. Chamber	EUPHORE	Paterna, Spain	Intercomparison and performance assessment of instrumentation at the EUPHORE atmospheric simulation chamber	Research, Technological service, Innovative service	Physical (preferred) remote access
Sim. Chamber	EUPHORE	Paterna, Spain	Technical and innovation services at the EUPHORE atmospheric simulation chamber	Technological service, Innovative service	Physical (preferred) remote access
Sim. Chamber	HELIOS	Orléans, France	Scientific exploration at the HELIOS atmospheric simulation chamber	Research service	Physical
Sim. Chamber	IASC	Cork, Ireland	Scientific exploration at the IASC atmospheric simulation chamber	Research service	Physical
Sim. Chamber	KASCs Kuopio atmospheric simulation chambers	Yliopistonranta 1, 70210 Kuopio, Finland	Atmospheric simulation chamber investigations	Research service	Physical
Sim. Chamber	MAC	Manchester, United Kingdom	Scientific exploration at the MAC atmospheric simulation chamber	Research service	Physical
Sim. Chamber	PACS-C2	Villigen, Switzerland	Scientific exploration at the PACS-CS Atmospheric Chemistry Simulation Chambers	Research service	Physical access preferred, remote access can also be provided
Sim. Chamber	PACS-C2	Villigen, Switzerland	Newly developed instrumentation testing and intercomparisons at PACS-C2	Innovation service	Physical
Sim. Chamber	QUAREC	Wuppertal, Germany	Investigation of kinetics and mechanism of gas-phase reaction systems	Research service, training service, technical service	Physical, remote

Sim. Chamber	QUAREC	Wuppertal, Germany	Testing of instruments for measuring air quality	Research service, technical service, innovation service	Physical (preferred) and remote
Sim. Chamber	SAPHIR	Forschungszentrum Jülich GmbH, Wilhelm-Johnen-Str., 52428 Jülich, Germany	Scientific exploration at the SAPHIR atmospheric simulation chamber	Research service	Physical access is preferred, remote access can also be provided
Mobile	FCoMLab	Helsinki and Tampere, Finland	Access to services of the FCoMLab Mobile Exploratory Platform	Research service	Physical, remote
Mobile	FORTH-MSC	Patras (Greece) but can be moved to any location in Europe.	Testing / intercomparisons of new instruments.	Technical service	Physical, remote
Mobile	FORTH-MSC	Patras (Greece) but can be moved to any location in Europe.	Characterization of sources and their atmospheric evolution.	Research service	Physical, remote
Mobile	FORTH-MSC	Patras (Greece) but can be moved to any location in Europe.	Chemical aging experiments for primary and secondary organic aerosol.	Research service	Physical, remote
Mobile	LACROS	Leipzig, Germany	Instrument Testing & Validation	Technical service	Physical, remote
Mobile	LACROS	Leipzig, Germany	Algorithm Testing & Validation	Research service	Physical, remote
Mobile	LACROS	Leipzig, Germany	Deployment at user-defined Location	Research service	Physical, remote
Mobile	LACROS	Leipzig, Germany	Case studies of aerosol-cloud-dynamics-precipitation interactions	Research service	Physical, remote
Mobile	LACROS	Leipzig, Germany	Training	Training service	Physical, remote
Mobile	USRL	CY, Nicosia, Cyprus	Access to services of the USRL Mobile Exploratory Platform	Research service	Physical, remote
Central Lab	DC-ARES	CNR-IMAA, Tito (Potenza), Italy	Single calculus cHain for Aerosol Remote sEnsing (SHARE)	Data service	Remote
Central Lab	CARS-ASP-FR	Lille, France	Instrumental development, characterization, calibration, data preparation and processing for aerosols retrievals of	Research, Technical, Innovation, Training	Physical, remote

			automatic sun/sky/lunar photometers		
Central Lab	CDPS - FTIR	Brussels, Belgium	Central Data Processing Systems for FTIR remote sensing data		Physical
Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	Organic trace gases (VOC/halocarbons)	Research service, technical service	Remote
Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	N2O isotopes	Research service, technical service	Remote
Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	@VOC@ QA tool	Training service	Remote
Central Lab	WCCAP	Leipzig, Germany	Calibration, Intercomparisons, Audits and Training	Research service, technical service	Physical, remote

3 Detailed list of services provided by Observational Facilities

3.1 Services provided by AGORA – Andalusian Global ObseRvatory of the Atmosphere

SERVICE 1 - Campaigns for Aerosol-Cloud Interaction Research	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Campaigns organized by local research group at urban (UGR) and mountain (SNS, CP) station for research in aerosol-cloud interaction based on synergistic combination of remote sensing and in-situ techniques. External research groups are invited to bring their own equipment (remote sensing or in situ) in order to get completeness in the essential variables (check AGORA equipment list) More information at: https://atmosphere.ugr.es/ The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Administrative support and advice for transportation, reception and storage of equipment. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: power connections, remote access, storage, security constraints, internet network (physical). - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

SERVICE 2 – Experiments for Aerosol-Cloud Interaction Research	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Specific experiments performed by using the available equipment at AGORA, combined with external equipment if needed. For example: use of polar nephelometer to study controlled ambient particles. More information at: https://atmosphere.ugr.es/ The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Administrative support and advice for transportation, reception and storage of equipment. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: power connections, remote access, storage, security constraints, internet network (physical). - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

SERVICE 3 – Instrument Testing and Intercomparison Campaigns	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Intercomparison campaigns. Comparison with AGORA instruments that follow ACTRIS protocols, in situ, remote sensing at urban (UGR) and mountain (SNS, CP) conditions. More information at: https://atmosphere.ugr.es/ The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Administrative support and advice for transportation, reception and storage of equipment. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: power connections, remote access, storage, security constraints, internet network (physical). - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

SERVICE 4 – Young Scientists Training	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Training through research of: a) operation and calibration techniques of remote sensing and in situ instrumentation available in AGORA b) algorithms for retrieval physical magnitudes from remote sensing instrumentation (LIRIC, GARRLIC, POLIPHON). This training can be performed by remote access More information at: https://atmosphere.ugr.es/ The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

SERVICE 5 – Training for Companies	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Operation, calibration and exploitation of scientific instrumentation related to aerosol, cloud and meteorological information applied to industry. Like Doppler Lidar wind information applied to unmanned aviation. More information at: https://atmosphere.ugr.es/

	The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)
SERVICE 6 – Support to private innovation	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Test, intercomparison and benchmarking services of technology from private to enhance innovation. For example: study, with the help of AGORA, in situ equipment, of impact of aerosols on new materials, properties of aerosols key for health industry, detection of hazardous aerosol particles. More information at: https://atmosphere.ugr.es/ The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). - Administrative support for managing accommodation near UGR and at mountain stations. - Technical support to remotely operate AGORA instrumentation (remote). - Scientific support for supervision and analysis of collected data (physical, remote). - Unlimited observations and measurements as long as they do not interfere with other projects or instruments availability.

ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

List of AGORA Equipment

AEROSOL REMOTE SENSING			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
Multi-spectral Raman Lidar (MULHACEN)	UGR	Emission at 355, 532, 1064 nm Detection at 355, 532, 1064 nm and at Raman 353.9, 408 and 530.2 nm	Attenuated backscatter profile Volume depolarization profile Particle backscatter coefficient profile Particle extinction coefficient profile Lidar ratio profile Ångström exponent profile Backscatter-related Ångström exponent profile Particle depolarization ratio profile Particle layer geometrical properties (height and thickness) Particle layer optical properties (extinction, backscatter, lidar ratio, Ångström exponent, M CARS DC NRT-S 60 m depolarization ratio, optical depth) Column integrated extinction Planetary boundary layer height Spectral Downward Sky Radiances Direct Sun/Moon Extinction Aerosol Optical Depth (column)
Sun photometer	UGR, CP	Radiance detection at 340, 380, 440, 500, 675, 870, 940, and 1020 nm	
Multi-spectral Raman Lidar, Dual-LMRD (in 2022)	UGR	Emission: 1064 nm, 532 nm, and 355 nm Detection at elastic channels: 355, 532, and 1064 nm; Detection at rotational Raman channels at R355, R532 nm and R1064 nm. Detection at vibrational raman channel at 408 nm	

CLOUD REMOTE SENSING			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
Microwave Radiometer	UGR	22-31 GHz (water vapor) and 51-58 GHz (O2)	Radar reflectivity factor Radar Doppler velocity Radar Doppler spectral width Radar linear depolarisation ratio Attenuated backscatter profile Cloud/aerosol target classification Drizzle drop size distribution Drizzle water content Drizzle water flux Ice water content Liquid water content Dissipation rate of TKE (turbulent kinetic energy) Atmospheric boundary layer classification Liquid water path Temperature profile Relative humidity profile Integrated water vapor path
Cloud Radar	UGR, Campaigns	Emission at 94GHz Vertical and scanning	
Doppler Lidar	UGR, Campaigns	Emission at 1500 nm	
Ceilometer	UGR, Campaigns	Emission at 1064 nm	

REACTIVE TRACE GASES REMOTE SENSING			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
UVVIS MAXDOAS (in late 2021)	UGR	Spectral Range: 270 - 530 nm	Ozone column Formaldehyde column Formaldehyde lower tropospheric profile NO2 column

AEROSOL IN SITU			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
Integrating nephelometer (InNe)	UGR, Campaigns	TSI 3563 3 wavelengths (450, 550 and 700 nm)	
Scanning particle mobility sizer (SMPS)	UGR, SNS, Campaigns	SMPS (TSI) Long and short DMA X-Rays and Kr-85 radioactive sources CPC 3772/3775	
Aerodynamic particle size spectrometer (APS)	Campaigns	TSI Mod. 3221	
Multi-angle absorption photometer (MAAP)	UGR, SNS, Campaigns	MAAP (Thermo 5012) Single wavelength (637 nm)	
Aethalometer	UGR, SNS	AE-33	Particle light scattering and backscattering coefficients
High-volume samplers	UGR, SNS, Campaigns	MCV sa, both sequential and manual operation mode	Particle number size distribution - mobility diameter Particle number size distribution-optical and aerodynamic diameter
TOF-ACSM	UGR, Campaigns	Aerodyne	Particle number concentration Nanoparticle number size distribution
CCN Counter	UGR, Campaigns	CCN200 (DMT) Dual column CCN counter Scanning SS High-time resolution	Nanoparticle number concentration Cloud condensation nuclei number concentration Mass concentration of particulate organic and elemental carbon Mass concentration of particulate organic tracers
Rapid-E	UGR, Campaigns	Automatic Bioaerosol Monitor. Fluorescence spectrometer	Mass concentration of non-refractory particulate organics and inorganics Mass concentration of particulate element
Hirst type sampler	SNS	Lanzoni	
Dry-wet deposition samplers	UGR, SNS	TISCH Scientific	
Total deposition collector	UGR, SNS	MCV sa	
Low Cost Air Quality Sensor	UGR, Campaigns	Modulair, Quantaq	
Polar Nephelometer	UGR	Airphotons CCD Camera Individual particles Scattered light from UV to IR (3 wavelengths) Scattered polarized light	

CLOUD IN SITU			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
Fog Monitor	SNS, Campaigns	FM120 (DMT) Light-scattering probe with 30 size bins 2-50 µm droplet diameters Swivel-head for wind orientation	Liquid Water Content Droplet effective diameter Droplet number concentration Droplet size distribution
Triple inlet	SNS (Total and interstitial inlets: fixed) Campaigns (GCVI)	Custom-made Total and interstitial inlets Ground-based counter flow virtual impactor (GCVI, Brechtel Inc)	Interstitial aerosol number concentration Interstitial aerosol size distribution Total aerosol number concentration Total aerosol size distribution Cloud residuals number concentration Cloud residuals composition

REACTIVE TRACE GASES IN SITU			
Instrument	**Station**	**Characteristics**	**ACTRIS Variables**
Fixed Platform (in 2022)	SNS	Thermo (CO, NOx, SO2 and O3), Syntech (VOCs) and TEOM (PM10)	Ozone column Formaldehyde column Formaldehyde lower tropospheric profile NO2 column
Mobile Platform (in 2022)	Campaigns	Air Quality mobile cabin	VOC NO NO2

COMPLEMENTARY			
Instrument	**Station**	**Characteristics**	**Variables**
Radiosondes	UGR	Graw, DFM-06 Balloons 100 g, 350 g vertical range: upper troposphere-lower stratosphere	vertical profiles of pressure, temperature, relative humidity, wind speed and direction.
Automatic Weather Station	UGR, SNS	Weather sensors Radiometers Data logger	Surface values of pressure, temperature, relative humidity, precipitation, wind speed and direction, solar irradiation (broadband, UVA, UVB and thermal infrared)
Disdrometer	UGR	Parsivel	Particle size and velocity of liquid and solid precipitation
Micro Rain Radar	SNS	MRR-2 (METEK, GmbH) Operating frequency: 24.230 GHz Zenith	Rain Rates Vertical profiles of drop size distribution, radar reflectivity, fall velocity of hydrometeors Time resolution: 0.1s Vertical resolution: 10-300m Vertical range: several km above the radar

3.2 Services provided by CESAR – Cabauw Experimental Site for Atmospheric Research

SERVICE 1 – Methane stable isotope analysis ($\delta^{13}C$-CH_4, δD-CH_4)	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement of air samples and calibration of cylinders for isotopic composition of CH_4 ($\delta^{13}C$ and δD) at Utrecht University. These measurements can be used for source attribution and isotope budgeting. Atmospheric samples should be provided in clean glass or metal flasks, suitable bags or cylinders in which CH_4 is stable. Samples from other media (water, sediments, etc.) can be analyzed as well. Specification of the sample containers and expected concentrations is beneficial.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Thomas Röckmann (t.roeckmann@uu.nl), Elena Popa (M.E.Popa@uu.nl)
SERVICE 2 – Methane clumped isotope analysis ($\Delta^{13}C$-D-CH_4, Δ-D-D-CH_4)	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement of gas samples for clumped isotopic composition of CH_4 ($\Delta^{13}CDH_3$ and ΔCD_2H_2) at Utrecht University. These measurements can be used for determining methane formation temperatures and non-thermodynamic equilibrium processes. Samples should be provided in suitable flasks. The concentration needed is typically > 5%, and it may be possible to analyze samples with CH_4 as low as 0.5 %, upon discussion. One analysis needs at least 5 ml STP of pure methane. The samples should always be discussed in advance.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Remote

TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Possible long waiting times
CONTACT	Elena Popa (M.E.Popa@uu.nl), Thomas Röckmann (t.roeckmann@uu.nl)

SERVICE 3 – Carbon monoxide stable isotope analysis (δ^{13}C-CO, δ^{18}O-CO)

TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement of air samples for isotopic composition of CO (δ^{13}C, δ^{18}O) at Utrecht University. These measurements can be used for source attribution and isotope budgeting. Atmospheric samples should be provided in clean glass or metal flasks in which CO is stable.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Elena Popa (M.E.Popa@uu.nl), Thomas Röckmann (t.roeckmann@uu.nl)

SERVICE 4 – Hydrogen stable isotope analysis (δD-H_2)

TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement of air samples for isotopic composition of H_2 (δD) at Utrecht University. These measurements can be used for source attribution and isotope budgeting. Atmospheric samples should be provided in clean glass or metal flasks in which H_2 is stable.
ATMOSPHERE TYPE	Ambient, controlled

TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Elena Popa (M.E.Popa@uu.nl), Thomas Röckmann (t.roeckmann@uu.nl)

SERVICE 5 – In-situ, column integrated, vertical profiling and spatial atmospheric observations

TYPE OF SERVICE	Data, research, technical, innovation, training service
SERVICE DESCRIPTION	The CESAR location in Cabauw is characterised by a 213 m high observation tower and surrounding observation field, located 50 km far from the North Sea. The site is ideal for atmospheric research on relations between the atmospheric boundary layer, land surface, weather, climate and atmospheric composition. The site is representative for long-term atmospheric studies because surroundings do not differ significantly from those in 1972 when the site was commissioned. Cabauw is one of very few observatories around the world that monitors such a wide scope of relevant processes in atmospheric chemistry and physics, hydrology, meteorology, climate, and atmospheric chemistry. The observational programme includes the following topics: - Operational meteorological station - Operational air quality monitoring station - In-situ observations of meteorological parameters, including extensive land-atmosphere interaction. - Energy balance observations including flux measurements. - Radiation observations, including a Baseline Surface Radiation Network (BSRN) installation and hemispherical cloud cover observations. - A suite of aerosol remote sensing instruments, including a high-performance multi-wavelength Raman lidar for aerosols, clouds and water vapour, a ceilometer and a UV-depolarisation lidar. - A suite of (scanning) cloud remote sensing instruments, including 3/35/94 GHz cloud radars, microwave radiometers - Precipitation observations including a scanning drizzle radar, micro rain radar and disdrometers. - Wind profile observations along the tower up to 200 m and a scanning Doppler wind lidar - Greenhouse gas observations at four different levels in the tower between 20 m and 180 m.

	- In-situ aerosol observations, including scattering and absorbing aerosol properties, as well as chemical speciation and isotope analysis. - Atmospheric composition measurements using in-situ observations and UV-VIS remote sensing. In addition, the specific flight-restricted area over the station offers the possibility for drones, and tethered balloon flights. The Cabauw site offers access for research projects, measurement campaigns, intercomparisons, and test facility for new instruments, as well as training. More information at: https://ruisdael-observatory.nl/cabauw/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business/private sector, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Arnoud Apituley (arnoud.apituley@knmi.nl)
SERVICE 6 – Cloud radar calibration	
TYPE OF SERVICE	The Cabauw site offers expertise, service and training for cloud radar calibration as part of the ACTRIS topical center for cloud remote sensing (CCRES).
SERVICE DESCRIPTION	More information at: https://ruisdael-observatory.nl/cabauw/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, business/private sector, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Prof.dr.ir. H.W.J. Russchenberg (herman.russchenberg@tudelft.nl)
SERVICE 7 – Trace gas remote sensing intercomparison	

TYPE OF SERVICE	The Cabauw site offers expertise, service and training for UV-VIS trace gas remote sensing intercomparisons as part of the ACTRIS topical center for trace gas remote sensing (CREGARS).
SERVICE DESCRIPTION	More information at: https://ruisdael-observatory.nl/cabauw/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, business/private sector, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Arnoud Apituley (arnoud.apituley@knmi.nl)

3.3 Services provided by CIAO – CNR-IMAA Atmospheric Observatory

SERVICE 1 - Training on Lidar data analysis, SCC and on technical aspects of Lidar systems	
LOCATION	Italy, Tito (Potenza) CIAO, the CNR-IMAA Atmospheric Observatory (40.60 N, 15.72 E, 760 m a.s.l.) is a research facilities managed by the National Research Council of Italy (CNR) at Institute of Methodologies for Environmental Analysis (IMAA). See http://www.ciao.imaa.cnr.it/
TYPE OF SERVICE	Research/Technical service/Training
SERVICE DESCRIPTION	This service is meant to increase the expertise of the users but also to spread ACTRIS standards and methodologies to stakeholders and users. It can offer different possibilities related to: • application of algorithms for Lidar data analysis • experimental technical aspects typically encountered in Lidar systems • access and use of the ACTRIS Single Calculus Chain (SCC)
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Multi-day stay of external users at CIAO must be discussed and planned with CNR-IMAA. External users are allowed to access the "CIAO observatory only under CNR-IMAA personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	tna-ciao@imaa.cnr.it
SERVICE 2 – Intercomparison of Lidar systems at CIAO	
LOCATION	Italy, Tito (Potenza)
TYPE OF SERVICE	Research/Technical service
SERVICE DESCRIPTION	The service will consist in the direct intercomparison of a lidar system with the ACTRIS lidar reference system operating at CIAO. At present it is able to provide aerosol backscatter at 1064, 532 and 355 nm, extinction at 532 and 355 nm, depolarization measurements at 532. In the future, the new reference lidar system will also be able to provide depolarization measurements at 1064 and 355 nm, and water vapor mixing ratio. The intercomparison will check the instrumental and technical performances of the lidar system in terms of range corrected signals, including several QA tests and correction procedures like trigger delay, first range bin, telecover, Rayleigh fit test, depolarization calibration, dead-time corrections.

ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered). At present, the reference system for the intercomparison is 1064, 532, 355, with Raman capability at 355 and 532 nm and depolarization at 532nm
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Multi-day stay of external users at CIAO must be discussed and planned with CNR-IMAA. External users are allowed to access the "CIAO observatory only under CNR-IMAA personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	tna-ciao@imaa.cnr.it
SERVICE 3 – Access and integration of data using different active, passive and in-situ instruments at CIAO	
LOCATION	Italy, Tito (Potenza)
TYPE OF SERVICE	Research/Technical service
SERVICE DESCRIPTION	Access and integration of data provided by different ACTRIS and ICOS (next future) active, passive and in-situ instruments operating at CIAO, included the possibility to carry out integrated studies through the access with the user instrument. Specific measurements campaign can be planned based on user request. CIAO geographic position, in the Mediterranean basin but on a mountain far from big cities, makes the observatory a perfect location for investigating different aerosol types and atmospheric processes and setting up experiments with the support of the researches and technicians operating CIAO.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered). At present the following instruments are available at CIAO: multi-wavelength Raman lidar, photometer, multiwavelength Raman lidar, Doppler lidar, cloud radar, microwave profiles, ceilometer, radio-sounding.
AVAILABILITY PERIOD	All year round

TIME CONSTRAINTS	Multi-day stay of external users at CIAO must be discussed and planned with CNR-IMAA. External users are allowed to access the "CIAO observatory only under CNR-IMAA personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	tna-ciao@imaa.cnr.it
SERVICE 4 – Laboratory characterization of instruments and blocks	
LOCATION	Italy, Tito (Potenza)
TYPE OF SERVICE	Research/Technical service/Training
SERVICE DESCRIPTION	A well-equipped laboratory is offered to test and characterize optical components typically used in Lidar systems. The laboratory is equipped with experimental setups for training in operation, calibration, quality control and basic debugging of Lidar related blocks.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is in implementation (not yet available)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Multi-day stay of external users at CIAO must be discussed and planned with CNR-IMAA. External users are allowed to access the "CIAO observatory only under CNR-IMAA personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	tna-ciao@imaa.cnr.it
SERVICE 5 – Testing and building Lidar configurations	
LOCATION	Italy, Tito (Potenza)
TYPE OF SERVICE	Research/Technical service
SERVICE DESCRIPTION	A modular Lidar laboratory is offered to set-up and test different lidar configurations: aerosol fluorescence; tropospheric aerosol optical properties; temperature with rotational Raman from troposphere to stratosphere; liquid water content; HSRL configuration; scanning measurements.
ATMOSPHERE TYPE	Ambient

TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is in implementation (not yet available)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Multi-day stay of external users at CIAO must be discussed and planned with CNR-IMAA. External users are allowed to access the "CIAO observatory only under CNR-IMAA personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	tna-ciao@imaa.cnr.it

3.4 Services provided by CMN-PV – CNR-ISAC Monte Cimone - Po Valley

SERVICE 1 - Calibration of chemioluminescence NOx analyzers at CMN-PV	
LOCATION	Italy, Monte Cimone (Modena) The "O. Vittori" observatory at Mt. Cimone (44°12' N, 10°42' E, 2165 m a.s.l.), is a research facilities managed by the National Research Council of Italy (CNR) and hosted by the Italian Air Force (CAMM). See http://actris-cimone.isac.cnr.it/measurement_sites/cimone.
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Calibration of chemioluminescence NOx analyzers with NO dilution and GPT. Equipment: zero air generator (Thermo 1160), dilution system (Thermo146i with range of dilution flow (0-5 SLPM), range of span flow (0-100 sccm)), 5ppm NO standard in N2 (NPL). Air-conditioning systems are available at the laboratories where instruments are located together with devices for protection by power surges and lightning. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision access (Mt. Cimone is located in a military area). – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m3 (max: 350 kg) except than during snow season. The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 2 people to the infrastructure (during the snow season this cannot be fully guaranteed).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)

AVAILABILITY PERIOD	All year round, but accessibility cannot be fully guaranteed during the snow season
TIME CONSTRAINTS	Multi-day stay of external users at the "O. Vittori" observatory must be discussed and planned with CNR-ISAC. External users are allowed to access the "O. Vittori" observatory only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 2 – Calibration of ozone analyzers at CMN-PV	
LOCATION	Italy, Monte Cimone (Modena)
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Calibration of ozone analyzers with secondary ozone calibrator. Equipment: secondary ozone calibrator Thermo 49i-PS with WMO-GAW certification. Air-conditioning systems are available at the laboratories where instruments are located together with devices for protection by power surges and lightning. More information at http://actris-cimone.isac.cnr.it/measurement_sites/cimone This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision access (Mt. Cimone is located in a military area). – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m3 (max: 350 kg) except than during snow season. The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 2 people to the infrastructure (during the snow season this cannot be fully guaranteed).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector

SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, but accessibility cannot be fully guaranteed during the snow season
TIME CONSTRAINTS	Multi-day stay of external users at the "O. Vittori" observatory must be discussed and planned with CNR-ISAC. External users are allowed to access the "O. Vittori" observatory only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 3 – Calibration of ozone analyzers	
LOCATION	Italy, Bologna
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Calibration of ozone analysers with secondary ozone calibrator. Equipment: secondary ozone calibrator Thermo 49i-PS with WMO-GAW certification. More information http://actris-cimone.isac.cnr.it/measurement_sites/bologna This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision of access to CNR-ISAC HQs. – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Access to chemistry laboratories and instrumental workshops at CNR-ISAC HQs.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Access to the CNR Campus is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access the CNR-ISAC HQs

	only with presence of CNR personnel. Accessibility rules can change ad a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 4 – DOAS measurement facility	
LOCATION	Italy, S. Pietro Capofiume (Bologna) The CMN-PV facility at S. Pietro Capofiume (50 km from Bologna) is located at the meteorological station "Giorgio Fea" which is owned by ARPAE Emilia-Romagna (43°21'N, 12°34'E, 11 m asl). http://actris-cimone.isac.cnr.it/measurement_sites/spc
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Provision of a rural site platform for DOAS and MAX-DOAS measurements with focus on tropospheric and stratospheric composition and processes, intercomparison campaigns and satellite validation. The facility is equipped with in-situ near-surface monitoring of SO2, particulate matter sampling for atmospheric chemical speciation, speciation of non-refractory chemical species (by Aerosol Mass Spectrometer, AMS) and measurements of number concentration (by twin - DMPS in collaboration with the University of Kuopio and one OPS). A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO2, SO2, HCHO, HONO, Glyoxal, BrO, IO, Ozone). Further observations will be implemented during 2022: physico-chemical-optical properties of both columnar aerosol population (sun photometry and lidar), near-surface aerosol scattering and absorption measurements, near-surface anthropogenic VOCs, SF6 and F-gases, radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone as well as meteo-radar measurements, radio soundings (at 00:00 and 12:00 UTC) and operates a phenological station. The facility is hosted in an air-conditioned shelter (15 m2) equipped with fast internet connection which allows for real-time data delivery and remote control of instrumentations. 5kW. Two sampling systems (ACTRIS-compliant) designed for trace gases and aerosol particles (respectively) are available at the station. Both the sampling systems are characterized by monitoring of T and RH with active control of air fluxes. Multiple inlets to the sampling systems are available for the external users (diameters: ¼" for trace gases and ¼", ½ and ¾" for aerosol). Three quartz windows (one on the roof, two on the walls) are available for vertical and horizontal remote sensing observations. Support structures to research activities are available at the field station: a chemistry laboratory, wi-fi covering the entire area, distribution of electric current through specific towers in different locations of the field, a 10-m two-storey tower.

	This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign) – Administrative support for the fulfilment of the internal procedures related with the provision access to the site. – Storing of the equipment at the CNR-ISAC HQs before and after the access. – Technical support at the infrastructure by senior technicians (including the support during installation of equipment and execution of measurements). – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded by CNR-ISAC. – Administrative support will be provided to ask access to the data by ARPAE Emilia – Romagna. – Access to the air quality and weather forecasts routinely produced by CNR-ISAC. – Access to laboratory and workshops at CNR-ISAC HQs for maintenance of instrumentation. – Transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m3 (max: 350 kg). The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 3 users to the facility (please note that not-UE users equipped with their own car/van must have an International Driving Permit valid in EU).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	Implementation
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Access to the S. Pietro Capofiume site is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access site only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it

SERVICE 5 – Calibration of chemioluminescence analyzers at CMN-PV	
LOCATION	Italy, Bologna
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Calibration of chemioluminescence NOx analysers with NO dilution and GPT. Equipment: zero air generator (Thermo 1160), dilution system (Thermo146i with range of dilution flow (0-5 SLPM), range of span flow (0-100 sccm)), 5ppm NO certified standard in N2. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision of access to CNR-ISAC HQs. – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Access to chemistry laboratories and instrumental workshops at CNR-ISAC HQs.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	Implementation
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Access to the CNR Campus is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access the CNR-ISAC HQs only with presence of CNR personnel. Accessibility rules can change ad a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 6 – In-situ intercomparison for near-surface gas and aerosol analyzers (mountain site platform)	
LOCATION	Italy, Monte Cimone (Modena)
TYPE OF SERVICE	Research service / Technical service

SERVICE DESCRIPTION	Provision of a high-mountain laboratory equipped with ACTRIS-compliant and ICOS-compliant sampling systems for reactive gases, aerosol and GHG as well as manifolds for intercomparison exercises of trace gas and aerosol instruments. The "O. Vittori" observatory at Mt. Cimone is the only high mountain station for atmospheric research both South of the Alps and the Po basin: it represents a strategic platform to study the South Europe and Mediterranean basin troposphere and the anthropogenic emissions from the Po basin. At this platform, co-located atmospheric ICOS and ACTRIS observations exist. Continuous measurement programmes for aerosol properties (physical/optical properties), trace gases (GHG and reactive), meteorological parameters are carried out at Mt. Cimone. The most part of these measurements are ICOS-, ACTRIS-, or INGOS- compliant in terms of equipment, materials and SOP. CMN-PV offers access to state-of-art technical and scientific equipment at the “O. Vittori” observatory. In particular, 2 sampling systems for trace gases and aerosol particles are available. The aerosol sampling system is equipped with T and RH monitoring. Multiple inlets are available for the external users (1/4” for gases, ¼”, ½ and ¾” for aerosol). One slot is available indoor for hosting one guest instrument for remote sensing. The terrace (about 40 m2) is equipped for hosting experimental activity and a small chemistry laboratory permits a clean treatment of collected samplings. Air-conditioning systems are available at the laboratories where instruments are located together with devices for protection by power surges and lightning. Fast internet connection allows real/time data delivery and remote control of acquisition systems. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision access (Mt. Cimone is located in a military area). – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded at the station. – Access to air quality and weather forecasts routinely produced by CNR-ISAC. – Access to storage and computation resources for the duration of TNA+12 months. – Shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m3 (max: 350 kg) except than during snow

	season. The transport of dangerous good or larger/heavier materials which need special vehicles are NOT included in the offered services. – Daily transportation of max 2 people to the infrastructure (during the snow season this cannot be fully guaranteed). – The "O. Vittori" observatory is equipped for overnight stay (max 5 people). Also a small kitchen is available.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, but accessibility cannot be fully guaranteed during the snow season
TIME CONSTRAINTS	As a function of the available slots for guest instruments. Multi-day stay of external users at the "O. Vittori" observatory must be discussed and planned with CNR-ISAC. External users are allowed to access the "O. Vittori" observatory only under CNR-ISAC personnel supervision. Accessibility rules can change ad a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 7 – In-situ intercomparison for near-surface gas and aerosol analysers (urban site platform)	
LOCATION	Italy, Bologna
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	Provision of an *urban site platform* equipped with ACTRIS-compliant sampling systems for reactive gases and aerosol with manifolds for intercomparison excercises of trace gas and aerosol instruments. The CMN-PV facility at Bologna is located on the roof of the CNR-ISAC HQs (25 m a.g.l.) within the CNR campus (Via Gobetti 101) at the city suburbs (http://actris-cimone.isac.cnr.it/measurement_sites/bologna). The measurement site is classified as urban background. The A14 motorway, BLQ international airport and the city center are located 0.8 km to North, 2.6 km to West and 1.7 km to South. The facility is hosted in an air-conditioned shelter (15 m2) located at the roof of CNR-ISAC HQs (39 m a.g.l.) equipped with fast internet connection which allows

	for real-time data delivery and remote control of instrumentations. Two sampling systems (ACTRIS-compliant) designed for trace gases and aerosol particles (respectively) are available at the station. Both the sampling systems are characterized by monitoring of T and RH with active control of air fluxes. Multiple inlets to the sampling systems are available for the external users (diameters: ¼" for trace gases and ¼", ½ and ¾" for aerosol). Three quartz windows (one on the roof, two on the walls) are available for vertical and horizontal remote sensing observations. Host instrumentations are represented by one ozone UV-absorption analyzer, one chemioluminescence NOx analyzer (with pre-reactor) and one meteorological station. A self-built MAX-DOAS system (TROPOGAS) is available at the station for measurement of trace gases (NO2, Ozone). A secondary ozone calibrator is available at the CNR-ISAC HQs. During 2022 the instrumental suite will be implemented (calibration facility for NOx, OPC, nephelometer). Submicron aerosol chemical composition by HR-ToF-AMS and equvalent black cabrbon observations are available by ARPAE-Emilia Romagna at the near "Supersito" site. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign) – Administrative support for the fulfilment of the internal procedures related with the provision of access to CNR-ISAC HQs. – Storing of the equipment at the CNR-ISAC HQs before and after the access. – Technical support at the infrastructure by senior technicians (including the support during installation of equipment and execution of measurements). – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded at the station by CNR - ISAC. – Access to the air quality and weather forecasts routinely produced by CNR-ISAC. – Access to storage and computation resources available at CNR-ISAC HQs for the duration of the TNA+12 months. – Access to chemistry laboratories and instrumental workshops at CNR-ISAC HQs.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round

TIME CONSTRAINTS	As a function of the available slots for guest instruments. Access to the CNR Campus is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access the CNR-ISAC HQs only with presence of CNR personnel. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 8 – In-situ intercomparison for near-surface gas and aerosol analysers (rural site platform)	
LOCATION	Italy, S. Pietro Capofiume (Bologna)
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	Provision of a *rural site platform* equipped with ACTRIS-compliant sampling systems for reactive gases and aerosol with manifolds for intercomparison exercises of trace gas and aerosol instruments. The station is equipped with in-situ near-surface monitoring of SO2, particulate matter sampling for atmospheric chemical speciation, speciation of non-refractory chemical species (by Aerosol Mass Specrometer, AMS) and measurements of particle number concentration (by twin - DMPS in collaboration with the University of Kuopio and one OPS). A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO2, SO2, HCHO, HONO, Glyoxal, BrO, IO, Ozone). Further observations will be implemented during 2022: physico-chemical-optical properties of both columnar aerosol population (sun photometry and lidar), near-surface aerosol scattering and absorption measurements, near-surface anthropogenic VOCs, SF6 and F-gases, radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone as well as meteo-radar measurements, radio soundings (at 00:00 and 12:00 UTC) and operates a phenological station. The facility is hosted in an air-conditioned shelter (15 m2) equipped with fast internet connection which allows for real-time data delivery and remote control of instrumentations. 5kW. Two sampling systems (ACTRIS-compliant) designed for trace gases and aerosol particles (respectively) are available at the station. Both the sampling systems are characterized by monitoring of T and RH with active control of air fluxes. Multiple inlets to the sampling systems are available for the external users (diameters: ¼" for trace gases and ¼", ½ and ¾" for aerosol). Three quartz windows (one on the roof, two on the walls) are available for vertical and horizontal remote sensing observations. Support structures to research activities are available at the field station: a chemistry laboratory, wi-fi covering the entire area, distribution of electric current through specific towers in different locations of the field, a 10-m two-storey tower.

	This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign) – Administrative support for the fulfilment of the internal procedures related with the provision access to the site. – Storing of the equipment at the CNR-ISAC HQs before and after the access. – Technical support at the infrastructure by senior technicians (including the support during installation of equipment and execution of measurements). – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded by CNR-ISAC. – Administrative support will be provided to ask access to the data by ARPAE Emilia – Romagna. – Access to the air quality and weather forecasts routinely produced by CNR-ISAC. – Access to storage and computation resources available at CNR-ISAC HQs for the duration of the TNA+12 months. – Access to laboratory and workshops at CNR-ISAC HQs for maintenance of instrumentation. – Transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m3 (max: 350 kg). The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 3 users to the facility (not-UE users equipped with their own car/van must have an International Driving Permit valid in EU).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	As a function of the available slots for guest instruments. Access to the S. Pietro Capofiume site is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access site only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it

SERVICE 9 – Analysis of atmospheric process by in-situ "near-surface" observations at a high mountain site	
LOCATION	Italy, Monte Cimone (Modena)
TYPE OF SERVICE	Research service /Training service/Data service
SERVICE DESCRIPTION	Provision of a high-mountain platform for investigation of atmospheric processes related to reactive and greenhouse gases, aerosol and clouds. The "O. Vittori" observatory is the only high mountain station for atmospheric research both South of the Alps and the Po basin: it represents a strategic platform to study the South Europe and Mediterranean basin troposphere and the anthropogenic emissions from the Po basin. At this platform, co-located atmospheric ICOS and ACTRIS observations exist. Continuous measurement programmes for aerosol properties (physical/optical properties), trace gases (GHG and reactive), meteorological parameters are carried out at Mt. Cimone. The most part of these measurements are ICOS-, ACTRIS-, or INGOS- compliant in terms of equipment, materials and SOP. CMN-PV offers access to state-of-art technical and scientific equipment at the “O. Vittori” observatory. In particular, 2 sampling systems for trace gases and aerosol particles are available. The aerosol sampling system is equipped with T and RH monitoring. Multiple inlets are available for the external users (1/4” for gases, ¼”, ½ and ¾” for aerosol). One slot is available indoor for hosting one guest instrument for remote sensing. The terrace (about 40 m2) is equipped for hosting experimental activity and a small chemistry laboratory permits a clean treatment of collected samplings. Air-conditioning systems are available at the laboratories where instruments are located together with devices for protection by power surges and lightning. Fast internet connection allows real/time data delivery and remote control of acquisition systems. The "O. Vittori" observatory is equipped for overnight stay (max 5 people). Also a small kitchen is available. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign). – Administrative support for the fulfilment of the internal procedures related with the provision access (Mt. Cimone is located in a military area). – Storing of the equipment at the CNR-ISAC headquarters before and after the access. – Technical support at the infrastructure by senior technicians, including support during installation of equipment and execution of measurements. – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded at the station.

	– Access to air quality and weather forecasts routinely produced by CNR-ISAC. – Access to storage and computation resources for the duration of TNA+12 months. – Shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m3 (max: 350 kg) except than during snow season. The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 2 people to the infrastructure (during the snow season this cannot be fully guaranteed).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, but accessibility cannot be fully guaranteed during the snow season
TIME CONSTRAINTS	As a function of the available slots for guest instruments. Multi-day stay of external users at the "O. Vittori" observatory must be discussed and planned with CNR-ISAC. External users are allowed to access the "O. Vittori" observatory only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it
SERVICE 10 – Analysis of atmospheric process by in-situ "near-surface" observations at an urban site	
LOCATION	Italy, Bologna
TYPE OF SERVICE	Research service /Training service/Data service
SERVICE DESCRIPTION	Provision of an urban platform for investigation of atmospheric processes related to reactive and greenhouse gases, aerosol and clouds. The measurement site is classified as urban background. The A14 motorway, BLQ international airport and the city center are located 0.8 km to North, 2.6 km to West and 1.7 km to South. The facility is hosted in an air-conditioned shelter (15 m2) located at the roof of CNR-ISAC HQs (39 m a.g.l.) equipped with fast internet connection which allows for real-time data delivery and remote control of instrumentations. Two sampling systems (ACTRIS-compliant) designed for trace gases and aerosol particles (respectively) are available at the station. Both the sampling systems are characterized by monitoring of T and RH with active control of air fluxes. Multiple inlets to the sampling systems are available for the external users (diameters: ¼"

	for trace gases and ¼", ½ and ¾" for aerosol). Three quartz windows (one on the roof, two on the walls) are available for vertical and horizontal remote sensing observations. Host instrumentations are represented by one ozone UV-absorption analyzer, one chemioluminescence NOx analyzer (with pre-reactor) and one meteorological station. A self-built MAX-DOAS system (TROPOGAS) is available at the station for measurement of trace gases (NO2, Ozone). A secondary ozone calibrator is available at the CNR-ISAC HQs. During 2022 the instrumental suite will be implemented (calibration facility for NOx, OPC, nephelometer). Submicron aerosol chemical composition by HR-ToF-AMS and equvalent black cabrbon observations are available by ARPAE-Emilia Romagna at the near "Supersito" site. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign) – Administrative support for the fulfilment of the internal procedures related with the provision of access to CNR/ISAC HQs. – Storing of the equipment at the CNR-ISAC HQs before and after the access. – Technical support at the infrastructure by senior technicians (including the support during installation of equipment and execution of measurements). – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded at the station by CNR - ISAC. – Access to the air quality and weather forecasts routinely produced by CNR-ISAC. – Access to storage and computation resources available at CNR-ISAC HQs for the duration of the TNA+12 months. – Access to chemistry laboratories and instrumental workshops at CNR-ISAC HQs.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	As a function of the available slots for guest instruments. Please not that access to the CNR Campus is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access the CNR-ISAC HQs only with presence of CNR personnel. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.

CONTACT	atmo-access@isac.cnr.it
SERVICE 11 – Analysis of atmospheric process by in-situ "near-surface" observations at a rural site	
LOCATION	Italy, S. Pietro Capofiume (Bologna)
TYPE OF SERVICE	Research service /Training service/Data service
SERVICE DESCRIPTION	Provision of a rural platform for investigation of atmospheric processes related to reactive and greenhouse gases, aerosol and clouds. The facility is equipped with in-situ near-surface monitoring of SO2, particulate matter sampling for atmospheric chemical speciation, speciation of non-refractory chemical species (by Aerosol Mass Specrometer, AMS) and measurements of number concentration (by twin - DMPS in collaboration with the University of Kuopio and one OPS). A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO2, SO2, HCHO, HONO, Glyoxal, BrO, IO, Ozone). Further observations will be implemented during 2022: physico-chemical-optical properties of both columnar aerosol population (sun photometry and lidar), near-surface aerosol scattering and absorption measurements, near-surface anthropogenic VOCs, SF6 and F-gases, radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone as well as meteo-radar measurements, radio soundings (at 00:00 and 12:00 UTC) and operates a phenological station. The facility is hosted in an air-conditioned shelter (15 m2) equipped with fast internet connection which allows for real-time data delivery and remote control of instrumentations. 5kW. Two sampling systems (ACTRIS-compliant) designed for trace gases and aerosol particles (respectively) are available at the station. Both the sampling systems are characterized by monitoring of T and RH with active control of air fluxes. Multiple inlets to the sampling systems are available for the external users (diameters: ¼" for trace gases and ¼", ½ and ¾" for aerosol). Three quartz windows (one on the roof, two on the walls) are available for vertical and horizontal remote sensing observations. Support structures to research activities are available at the field station: a chemistry laboratory, wi-fi covering the entire area, distribution of electric current through specific towers in different locations of the field, a 10-m two-storey tower. This service includes: – Administrative support for helping the users with shipping of materials (before and after the campaign) – Administrative support for the fulfilment of the internal procedures related with the provision access.

	– Storing of the equipment at the CNR-ISAC HQs before and after the access. – Technical support at the infrastructure by senior technicians (including the support during installation of equipment and execution of measurements). – Interaction with senior atmospheric scientists for data interpretation and optimal definition of experiment strategy. – Activation of data delivery service and access to data routinely recorded by CNR-ISAC. – Access to storage and computation resources available at CNR-ISAC HQs for the duration of the TNA+12 months. – Administrative support will be provided to ask access to the data by ARPAE Emilia – Romagna. – Access to the air quality and weather forecasts routinely produced by CNR-ISAC. – Access to laboratory and workshops at CNR-ISAC HQs for maintenance of instrumentation. – Transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m3 (max: 350 kg). The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services. – Daily transportation of max 3 users to the facility (not-UE users equipped with their own car/van must have an International Driving Permit valid in EU) .
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	As a function of the available slots for guest instruments. Access to the S. Pietro Capofiume site is typically not allowed during the weekend and over 20:00 – 7:00 local time. External users are allowed to access site only under CNR-ISAC personnel supervision. Accessibility rules can change as a function of the evolution of the COVID-19 pandemic.
CONTACT	atmo-access@isac.cnr.it

3.5 Services provided by the ISAF – Izaña Observatory (IZO)

SERVICE 1 – ISAF-Cal Calibration and intercomparison of photometers at IZO	
TYPE OF SERVICE	Technical service [including research, technical developments, intercomparisons, calibrations (traceability to world reference)]
SERVICE DESCRIPTION	Calibration of photometers in terms of Langley procedures in pristine conditions (a certificate will be provided) and comparison of photometers with reference instrument enabling improvements and optimization of them. More information at: https://izana.aemet.es/column-aerosols/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Natalia Prats (npratsp@aemet.es)

SERVICE 2 – ISAF-Obs Atmospheric observations in free-troposphere conditions at IZO	
TYPE OF SERVICE	Research, campaigns, intercomparisons
SERVICE DESCRIPTION	Synergistic observation of aerosol and trace gases with in-situ and remote sensing techniques, meteorology and radiation (ICOS/INGOS/ACTRIS synergy); Intercomparisons with operational instruments (reporting data to worldwide networks and programmes as WMO-GAW, NDACC, etc); study of atmospheric composition in pristine conditions and with desert dust influences; support in specific campaigns to study atmosphere in remote high mountain conditions, for example to study NPF, desert dust aerosols, transatlantic transport, etc. https://izana.aemet.es/observatories/#izo https://izana.aemet.es/--> R&D --> Research and Monitoring Programs. Physical access includes use of the facilities, as well as help in the preparatory work and training (if needed), and technical and scientific support during the execution. Remote access includes remote access to instruments with in-situ support by ISAF scientist and technicians. Also offered: – Set-up and disassembling, instrument handling and operation, – training on the use of the facility, – scientific or technical expertise (data handling/use), – power with UPS, internet, – accommodation facilities (residence with 7 double-rooms) and kitchen, transportation service available on schedule for displacement from Santa Cruz to ISAF, – support in customs clearance and paperwork, – advice on instrumentation shipping and transport, – storage space, security service.
ATMOSPHERE TYPE	Ambient (also in laboratory conditions, ex. Temp around 22ºC)
TYPE OF ACCESS	Physical (once installed also remote)
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Natalia Prats (npratsp@aemet.es)

3.6 Services provided by the JFJ - High Altitude Research Station Jungfraujoch

SERVICE 1 – Research programmes on trace gases (i.e. greenhouse gases, reactive air pollutants) and aerosols	
TYPE OF SERVICE	Research, data, innovation
SERVICE DESCRIPTION	JFJ (3450 m asl) is the highest research station in Europe that is accessible all year round by rail, and it 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 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). Users have access to JFJ measurement platforms to deploy and operate instruments and to data from continuously operating instruments (access to real-time and archived data). Examples of scientific activities that can be performed at the facility 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. - Installation, operation and maintenance of specific instrumentation to be operated remotely. More information at: **:** http://www.hfsjg.ch/jungfraujoch
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Martin Gysel Beer, PSI, martin.gysel@psi.ch Nora Kristina Nowak, PSI, nora.nowak@psi.ch

3.7 Services provided by the Melpitz Research Station

SERVICE 1 – Aerosol physico-chemical properties (ground and vertical)	
TYPE OF SERVICE	Data, research, technical, innovation, training service
SERVICE DESCRIPTION	Long-time observation of Physical and chemical properties of aerosols combining online and offline measurements. Ground-based measurements can be completed with vertical measurements (ceilometer, LIDAR, …). In addition, the specific flight-restricted area over the station offers the possibility for UAVs, drones, and tethered balloon flights. The research site Melpitz can be used for research projects, measurement campaigns, intercomparison, and test facility for new instruments. More information at: https://www.tropos.de/en/research/projects-infrastructures-technology/coordinated-observations-and-networks/tropos-research-site-melpitz
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business/private sector, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Prof. Hartmut Herrmann (herrmann@tropos.de) Dr. Laurent Poulain (poulain@tropos.de)

3.8 Services provided by RADO – Romanian Atmospheric 3D research Observatory

SERVICE 1 – Aerosol-clouds-radiation studies	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Short and long-term experimental campaigns at RADO premises, using RADO's infrastructure and user's own instrumentation. The infrastructure at RADO combines ACTRIS compliant aerosol remote sensing, cloud remote sensing and aerosol in-situ instrumentation, along with complementary measurements for meteorological parameters and radiation. Additional instruments from the users can be accommodated indoor or outdoor, as needed. The service includes: • Support from the technical staff to install and operate the instruments • Support from the scientific staff to collect, process and analyze the data.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Jeni Vasilescu (jeni@inoe.ro)

SERVICE 2 – Cal/Val campaigns in support of satellite atmospheric missions	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Short and long-term experimental Cal/Val campaigns at RADO premises, using RADO's infrastructure and user's own instrumentation. The infrastructure at RADO combines ACTRIS compliant aerosol remote sensing, cloud remote sensing and aerosol in-situ instrumentation, along with complementary measurements for meteorological parameters and radiation. Additional instruments from the users can be accommodated indoor or outdoor, as needed. Overflights with small research aircrafts possible. The service includes: • Support from the technical staff to install and operate the instruments • Support from the scientific staff to set the measurements schedule coincident with satellite overpasses • Support from the scientific staff to collect, process and analyze the data.
ATMOSPHERE TYPE	Pre-urban
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia, ESA, EUMETSAT
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Jeni Vasilescu (jeni@inoe.ro)
SERVICE 3 –Training	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Training through hands-on operation of instruments and data analysis. The service applies to aerosol remote sensing, cloud remote sensing and aerosol in-situ measurement techniques and variables as defined in ACTRIS. The service includes: • Hands-on training for operation and calibration of instruments • Training for setting up data processing environments • Training for using advanced processing algorithms (NATALI, GRASP)
ATMOSPHERE TYPE	Ambient

TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Jeni Vasilescu (jeni@inoe.ro)
SERVICE 4 – Deployment of mobile reference aerosol lidar for short-term campaigns	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Deployment of a mobile aerosol lidar for short-term campaigns and/or direct comparisons with similar instruments. The instrument operates at 1064, 532 and 355 nm wavelengths, with polarization at 532 nm and nighttime extinction capabilities at 532 and 355 nm. It can be operated inside a van (provided by RADO on request) or accommodated in the user's laboratory (specific conditions to be discussed in advance). The service includes: • Deployment and installation of the instrument at the user's premises • Calibration, and operation of the instrument • Provision of the raw measurements • Provision of the processed data
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector, privates
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Livio Belegante (livio@inoe.ro)

SERVICE 5 – Testing of aerosol lidar prototypes	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Testing of aerosol lidar prototypes by direct comparison with the reference Aerosol High-power Lidar operated at RADO premises by the ACTRIS Centre for Aerosol Remote Sensing (CARS). The instrument operates at 1064, 532 and 355 nm wavelengths, with polarization and daytime extinction capabilities, including HSRL at 532 nm. The user can either send the instrument, or accompany the instrument at RADO's premises. The service includes: • Support from the technical staff to install and operate the instruments • Support from the scientific staff to select and implement the testing scenarios • Support from the scientific staff to perform the comparative measurements and analyze the results
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Livio Belegante (livio@inoe.ro)

3.9 Services provided by the SBO – Sonnblick Observatory

SERVICE 1 – Intercomparison of instruments for cloud in situ, LWC	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Comparison of instruments measuring LWC with a fixed European ACTRIS reference instrument, short report and certificate
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business, public sector
SERVICE STATUS	In implementation, starting in 2023/24
AVAILABILITY PERIOD	Summer, Autumn
TIME CONSTRAINTS	Yearly
CONTACT	Christian Maier (christian.maier@zamg.ac.at)
SERVICE 2 – Sampling support	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Support in the collection of precipitation (snow, ice, rain), filter or other samples in the area of Mt. Hoher Sonnblick for scientific analyses, also event-based sampling
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Elke Ludewig (elke.ludewig@zamg.ac.at)

SERVICE 3 – Instrument operation	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Planning, installation, commissioning and support of measuring instruments, which should measure at the Sonnblick Observatory. Connection to inlet, indoor or outdoor operation, documentation and feedback with instrument owner.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Elke Ludewig (elke.ludewig@zamg.ac.at)
SERVICE 4 – Training	
TYPE OF SERVICE	Research service, Training service
SERVICE DESCRIPTION	Internship for students to become familiar with observatory operations and conduct their own small studies. Duration at least 2 weeks at the observatory.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Twice a year
TIME CONSTRAINTS	Winter, Summer
CONTACT	Elke Ludewig (elke.ludewig@zamg.ac.at)
SERVICE 5 – Cable car profiles	
TYPE OF SERVICE	Technical service

SERVICE DESCRIPTION	The Sonnblick Observatory has a cable car that covers 1,500 meters in altitude between the valley and the mountain. The cable car can be used for measuring profiles.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business, public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	No operation during thunderstorms
CONTACT	Elke Ludewig (elke.ludewig@zamg.ac.at)
SERVICE 6 – Data analysis and preparation	
TYPE OF SERVICE	Data service, Research service
SERVICE DESCRIPTION	Data analysis and preparation of SBO data on specific issues, as well as graphical processing and reporting
ATMOSPHERE TYPE	n/a
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business, public sector
SERVICE STATUS	Implementation
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Depending on free resources and available lead time
CONTACT	Elke Ludewig (elke.ludewig@zamg.ac.at)
SERVICE 7 – Regional to global backwards modelling with ECMWF-FLEXPART model	
TYPE OF SERVICE	Data service, Research service
SERVICE DESCRIPTION	Identification of possible source regions for air masses arriving at observatory based on atmospheric transport modelling based on meteorological forecast or analysis data from ECMWF
ATMOSPHERE TYPE	n/a
TYPE OF ACCESS	Remote

TARGET USERS	Academia, business
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Upon request depending on requirements (e.g. time period)
CONTACT	Kathrin Baumann-Stanzer (k.baumann-stanzer@zamg.ac.at)
SERVICE 8 – Time-series of atmospheric boundary layer heights derived from ceilometer observations	
TYPE OF SERVICE	Data service, Research service
SERVICE DESCRIPTION	Identification of height-range above valley floor influenced by boundary layer air/free troposphere.
ATMOSPHERE TYPE	n/a
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Upon request depending on requirements (e.g. time period)
CONTACT	Kathrin Baumann-Stanzer (k.baumann-stanzer@zamg.ac.at)
SERVICE 9 – Measurement of boundary layer wind and turbulence profiles	
TYPE OF SERVICE	Technical service, data service, research service
SERVICE DESCRIPTION	Conduction of wind Lidar measurements, data processing
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	Depending on the availability of instrumentation

CONTACT	Kathrin Baumann-Stanzer (k.baumann-stanzer@zamg.ac.at)
SERVICE 10 – Specific weather forecast for Mt. Hoher Sonnblick	
TYPE OF SERVICE	Information
SERVICE DESCRIPTION	Weather forecast for Mt. Hoher Sonnblick: From permanently updated very short range forecasts (Nowcasts) over day-to-day forecasts to long-term and trends over weeks
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, Business, Public sector, privates
SERVICE STATUS	Implementation
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Michael Butschek (m.butschek@zamg.ac.at)
SERVICE 11 – Climate scenarios for Mt. Hoher Sonnblick	
TYPE OF SERVICE	Information
SERVICE DESCRIPTION	Climate scenarios and climate change information for Sonnblick, for different altitude levels by the year 2100
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, Business, Public sector, privates
SERVICE STATUS	Implementation
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Alexander Ohms (a.ohms@zamg.ac.at)
SERVICE 12 – Meteorological consulting	
TYPE OF SERVICE	Information

SERVICE DESCRIPTION	Individual consulting on meteorological topics of any kind associated with Mt. Hoher Sonnblick (in particular weather briefings)
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, Business, Public sector, privates
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round 24/7
TIME CONSTRAINTS	None
CONTACT	Michael Butschek (m.butschek@zamg.ac.at)
SERVICE 13 – Avalanche advice and avalanche warning service	
TYPE OF SERVICE	Information
SERVICE DESCRIPTION	Access to avalanche warning system and individual consulting on avalanche topics associated with Sonnblick
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, Business, Public sector, privates
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Winter, Spring, late Autumn
TIME CONSTRAINTS	None
CONTACT	Michael Butschek (m.butschek@zamg.ac.at)

3.10 Services provided by the SMEAR II - Station for measuring Ecosystem-Atmosphere relations

SERVICE 1 – Scientific services for cutting edge aerosol/trace gases and clouds science	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	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 has several operation units to reach into and above the stand canopy. 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). The site contributes to ACTRIS (in-situ aerosol and trace gases, and remote sensing of clouds). SMEAR is comprehensive and co-located ICOS, ACTRIS and LTER site. More information at: https://www.helsinki.fi/en/research-stations/hyytiala-forestry-field-station Available services: - in-depth calibration and verification laboratories, - development, co-development and testing of new technologies/scientific exploration, new instruments, - hands-on training activities at the site - virtual training opportunities, - installation, operation and maintenance of guest instrumentation, - instrument benchmarking, field calibrations for selected instrumentation. SMEAR II is operational 24/7, year-round. The services also include: • On-site accommodation and support • open access to comprehensive multidisciplinary SMEAR II data • Technical help and instrument monitoring and maintenance for observations during extended periods, • research planning and training.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia, Private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round

TIME CONSTRAINTS	None
CONTACT	Tuukka Petäjä, tuukka.petaja@helsinki.fi

4 Detailed list of services provided by Simulation Chambers

4.1 Services provided by ACD-C/LACIS-T – Aerosol Chamber of the Atmospheric Chemistry Department (ACD-C) and Turbulent Leipzig Aerosol Cloud Interaction Simulator (LACIS-T)

SERVICE 1 – Training on: (a) state of the art offline and online analytical instrumentation, (b) good chamber practice at ACD-C	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	a) Hands-on training sessions on state of the art analytical instrumentation connected to ACD-C. b) Training on how to perform chamber experiments by experienced scientists.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Open
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	PI: Prof. Hartmut Herrmann; Contact person: Dr. Falk Mothes
SERVICE 2 – Scientific research on tropospheric multiphase processes under controlled chamber conditions at ACD-C	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	ACD-C with its twin chamber setup is a unique research infrastructure to study VOC degradation mechanism, SOA formation processes, the chemical composition of the gas/ particle phase, and toxicological effects of formed SOA. The twin chamber is equipped with a broad 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. The Leipzig Biomass Burning Facility (LBBF) as additional part of ACD-C allows studies on primary emissions as well as the processing of the emitted smoke. A broad online and offline instrumentation at ACD-C enables highly sophisticated research on tropospheric multiphase processes to provide the heighest level of understanding on a molecular level.

ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Open
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	PI: Prof. Hartmut Herrmann; Contact person: Dr. Falk Mothes
SERVICE 3 – Newly developed instrumentation testing, (inter)calibrations and intercomparisons at ACD-C	
TYPE OF SERVICE	Innovation service
SERVICE DESCRIPTION	ACD-C provides the possibility of testing new instrumentation and to perform (inter)calibrations or intercomparisons. Existing standard operation procedures can be used for comparison of new with established analytical techniques/instruments by the user.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Open
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	PI: Prof. Hartmut Herrmann; Contact person: Dr. Falk Mothes
SERVICE 4 – Support for instrument (innovation) development at ACD-C	
TYPE OF SERVICE	Technological service
SERVICE DESCRIPTION	The technological services of ACD-C provide comprehensive basic principles for instrument development and strategic improvements.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical

TARGET USERS	Open
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	PI: Prof. Hartmut Herrmann; Contact person: Dr. Falk Mothes
SERVICE 5 – Scientific research on cloud-microphysics - turbulence interaction at LACIS-T	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	LACIS-T is a unique infrastructure for investigating turbulence and its influences on cloud-microphysical processes. The investigations take place under well-controlled and reproducible flow, turbulence and thermodynamic (temperature, humidity) conditions. LACIS-T is equipped with high-end instrumentation for characterizing the prevailing thermodynamic, flow, turbulence and microphysical conditions. This includes measurements of temperature, mean water vapor concentration, flow velocity, turbulence intensity and dissipation rate as well as cloud particle size distributions.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Dennis Niedermeier (niederm@tropos.de) Frank Stratmann (stratman@tropos.de)
SERVICE 6 – Testing of (new) intrumentation, and instrument intercomparisons under turbulent conditions at LACIS-T	
TYPE OF SERVICE	Technical and innovation service

SERVICE DESCRIPTION	LACIS-T provides the possibility of testing (new) instrumentation (e.g., velocity, temperature, humidity, as well as optical particle sensors) and to perform sensor intercomparisons under well-defined laboratory conditions. Existing standard operation procedures can be used for comparison of new with established instruments by the user.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Dennis Niedermeier (niederm@tropos.de) Frank Stratmann (stratman@tropos.de)
SERVICE 7 – Training on LACIS-T including state-of-the-art instrumentation	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Training on how to perform experiments in humid turbulent flows by experienced scientists as well as hands-on training on high-end and state-of-the-art instrumentation for characterizing turbulent flows, as well as thermodynamic and aerosol particle and droplet microphysical properties.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Dennis Niedermeier (niederm@tropos.de) Frank Stratmann (stratman@tropos.de)

4.2 Services provided by AURA – Aarhus University Research on Aerosols chamber

SERVICE 1 – Experiments in Atmospheric Simulation Chamber	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Aerosol generation and ageing in the temperature range -16 to 26°C and possibility for ramping of temperature during experiments. Sea spray simulation chamber (AEGOR) can be connected to the AURA chamber. A suite of state of the art on-line and off-line methods are available for gas and particle characterization. For a description of the methods for off-line analysis: https://chem.au.dk/en/research/research-areas-and-research-groups/analyticalchemistry/ac3/equipment/ More information at: https://chem.au.dk/forskning/forskningsomraader/fysiskkemi/atmosfaerisk-fysisk-kemi/udstyr/
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Mainly physical
TARGET USERS	Mainly academia (collaborative projects), potentially business/private sector
SERVICE STATUS	The service is available (under continued development)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	Merete Bilde, bilde@chem.au.dk (PI) Mads Mørk Jensen (facility manager), madsmj@chem.au.dk

4.3 Services provided by ChAMBRe – Chamber for Atmospheric Modelling and Bio-Aerosol Research

SERVICE 1 – Bioaerosol characterization	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Measurement of bacteria viability vs. atmospheric and air quality conditions: injection of viable bacteria through different nebulizer, production in the chamber of different atmospheric conditions and composition (meteo-climatic, gaseous and aerosol species concentration), monitoring of the bacteria concentration via particle counters and WIBS, collection of viable bacteria through Andersen impactor, liquid impingers, petri dishes, filters. Incubation and counting, microscopic characterization. More details at: https://labfisa.ge.infn.it/index.php/chambre
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Paolo Prati (prati@ge.infn.it
SERVICE 2 – Testing and characterization of bioaerosol monitors/sensors	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Testing/characterization/calibration of bioaerosol on-line monitors/sensors: injection of different bacteria strains and measurement of the detectors response, testing of selection/identification algoritms, comparison with WIBS-NEO response, possibility to include fungi and pollens. More details at: https://labfisa.ge.infn.it/index.php/chambre
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector

SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Paolo Prati (prati@ge.infn.it
SERVICE 3 – Measurement of aerosol optical properties	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Multi-wavelength on-line and off-line measurement of the optical properties (absorption and scattering) of atmospheric aerosols: injection of different aerosol species (soot, dust, salt, organic), modulation of the meteo-climatic conditions, on-line measurement by 3-lambda photoacoustics monitors (PAXs), OPS and SMPS, sampling on filters/impactors and off-line analyses by Multi Wavelength Absorbance Analyzer (MWAA)and two-lambda thermo-optical analysis. More details at: https://labfisa.ge.infn.it/index.php/chambre.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Paolo Prati (prati@ge.infn.it
SERVICE 4 – Testing of samplers and gas/aerosol monitors	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Testing and calibration of aerosol samplers and aerosols/gas monitors (e.g. low-cost detectors): connection/introduction of the samplers/detectors to/in the chamber, production of different aerosol and gas species, comparison of the detectors response with those of the ChAMBRe reference equipment. More details at: https://labfisa.ge.infn.it/index.php/chambre
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote

TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Paolo Prati (prati@ge.infn.it
SERVICE 5 – Design, organization and execution of custom experiments	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Custom experiments on aerosol chemistry and physics: ChAMBRe is a multi-purpouse facility connected to a laboratory fully equipped for aerosol sampling and characterization. Specific experiments/tests can be organized with the support of the ChAMBRe teams. Full description of the multi-purpose facility at https://labfisa.ge.infn.it/
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Paolo Prati (prati@ge.infn.it

4.4 Services provided by EUPHORE – Simulation of Atmospheric PHotochemistry In a large Reaction Chamber

SERVICE 1 – Scientific research at the EUPHORE atmospheric simulation chamber	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	- Provision of data from simulation chamber experiments on study of atmospheric behaviour of biogenic and anthropogenic VOCs and semiVOCs, aerosols, product formation, etc. under nearly real conditions. - Access to a broad variety of instruments, both stablished and state-of-the art, including PTR-ToF-MS, CI-APi-ToFMS, etc. - Validation of photochemical models. - Support for planning and evaluation of data experiments.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None. Coordination with other activities of the facility is needed.
CONTACT	Amalia Muñoz (amalia@ceam.es)
SERVICE 2 – Intercomparison and performance assessment of instrumentation at the EUPHORE atmospheric simulation chamber	
TYPE OF SERVICE	Research, Technological service, Innovative service
SERVICE DESCRIPTION	- Intercomparison of instrumentation to evaluate performance under different environmental conditions. - Study of interferences. - Accommodation of a large number of external instruments. Support in planning and installation. - Use of the chamber for technological development of instruments
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Academia, Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)

AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None. Coordination with other activities of the facility is needed.
CONTACT	Amalia Muñoz (amalia@ceam.es)
SERVICE 3 – Technical and innovation services at the EUPHORE atmospheric simulation chamber	
TYPE OF SERVICE	Technological service, Innovative service
SERVICE DESCRIPTION	- Prototype testing. - Use of the chamber to test, develop or improve new depolluting materials or devices, e.g. air cleaners, etc. - Tests close to market - Support for planning and evaluation of data experiments.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Business, Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None. Coordination with other activities of the facility is needed.
CONTACT	Amalia Muñoz (amalia@ceam.es)

4.5 Services provided by PACS-C2 – PSI Atmospheric Chemistry Simulation Chambers

SERVICE 1 – Scientific exploration at the PACS-C2 atmospheric simulation chamber	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The service consists of: - Provision of data from simulation chamber experiments, - possibility to perform 6hr experiments in the simulation chamber, - technical service to use own instruments, - training for planning, evaluation and interpretation of experiments. - Hands-on training sessions with state of the art instrumentation connected to PACS-C2 - Training on how to perform chamber experiments by experienced scientists. PSI has a full suite of state of the art instrumentation. Depending on the objectives of the campaign, the chambers can be equipped with the following instruments for gas phase characterization: a proton-transfer reaction time of flight mass spectrometer (PTR-TOF-MS), a chemical ionization atmospheric pressure interface time of flight MS (CI-APi-TOF), as well as the standard NOx and ozone monitors; for NO there is also a high sensitivity instrument (detection limit 5 ppt) available, important for experiments a low NOx conditions. For the characterization of the particle phase the following instrumentation is available: condensation particle counters with different lower cut-off sizes (3 and 10 nm), a particle size magnifier (PSM for even smaller particles, scanning mobility particle sizers (SMPS) for the size distribution (two different size ranges available with a nano and a standard SMPS), a high resolution time of flight aerosol mass spectrometer (TOF-AMS), extractive electrospray ionization time-of-flight mass spectrometer (EESI-ToF), an instrument for on-line determination or reactive oxygen species (ROS) and peroxides. For black carbon measurements, a single particle soot photometer (SP2) and an aethalometer are available. PACS-C2 also focuses on studies on primary emissions and has many sources of primary emissions available (e.g residential wood burning, coal combustion, open burning emissions, vehicular idle emissions).
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Mainly academia, but also business /private sector
SERVICE STATUS	The service is available (operational and ready to be offered)

AVAILABILITY PERIOD	Year round.
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	David Bell (david.bell@psi.ch)
SERVICE 2 – Newly developed instrumentation testing and intercomparisons at PACS-C2	
TYPE OF SERVICE	Innovation service
SERVICE DESCRIPTION	PACS-C2 provides the possibility of testing new instrumentation and to perform (inter)calibrations or intercomparisons. Existing standard operation procedures can be used for comparison of new with established analytical techniques/instruments with the user.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Open
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	David Bell (david.bell@psi.ch)

4.6 Services provided by QUAREC-ASC – QUAREC Atmospheric Simulation Chamber

SERVICE 1 – Investigation of kinetics and mechanism of gas-phase reaction systems	
TYPE OF SERVICE	Research service, training service, technical service
SERVICE DESCRIPTION	The QUAREC facility (the simulation chamber and the analytical instruments) allows investigating: - homogeneous gas-phase reaction systems (determination of rate coefficients and products formation for the reactions of OH, NO3 halogens and ozone with VOCs) - formation of airborne particulates in homogeneous gas-phase reaction systems.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Private and Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, excepting March – obligatory maintenance of the ventilation systems.
TIME CONSTRAINTS	None, but the request of access should be sent at least 2 months in advance.
CONTACT	Peter Wiesen (wiesen@uni-wuppertal.de)
SERVICE 2 – Testing of instruments for measuring air quality	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	QUAREC can be used to test instruments developed for use in air quality measurements: - testing and comparison of instruments and methods - scientific and technical training.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred), remote
TARGET USERS	Academia, Private and Public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, excepting March – obligatory maintenance of the ventilation systems.

TIME CONSTRAINTS	None, but the request of access should be sent at least 2 months in advance.
CONTACT	Ralf Kurtenbach (kurtenba@uni-wuppertal.de)

4.7 Services provided by SAPHIR – Simulation of Atmospheric PHotochemistry In a large Reaction Chamber

SERVICE 1 – Scientific exploration at the SAPHIR atmospheric simulation chamber	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	SAPHIR is operated by FZJ and 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. Controlled artificial trace gas mixtures, ambient air or emissions from plants can be added to SAPHIR. 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. CiGas-FZJ manages the calibration activities for the in situ measurements of NOx within ACTRIS and GAW. More information at: http://www.fz-juelich.de/iek/ iek-8/EN/Expertise/ Infrastructure/ SAPHIR/ SAPHIR_node.html The chamber is used for high quality experiments investigating the transformation of gas-phase species and aerosols with: i) permanently installed and calibrated instrumentation; ii) additional instrumentation provided by users while planning of experiments is carried out in collaboration with experts from FZJ. 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. The services also includes: - Provision of data from simulation chamber experiments, - possibility to perform several day-long experiments in the simulation chamber, - technical service to use own instruments, - training for planning, evaluation and interpretation of experiments.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Mainly academia, but also business /private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Typically between April and September (photo-chemistry experiments)

TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	Hendrik Fuchs (h.fuchs@fz-juelich.de)

5 Detailed list of services provided by Mobile Facilities

5.1 Services provided by the FORTH Mobile Atmospheric Simulation Chamber

SERVICE 1 – Testing / intercomparisons of new instruments	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Testing / intercomparisons of new instruments (inorganic and organic, gas-phase and particulate pollutants) More information at: http://cstacc.iceht.forth.gr/research-facilities/experimental-facilities/laboratories
ATMOSPHERE TYPE	Controlled or ambient or a combination of the two.
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None in general. Coordination and planning in advance needed for the transportation of the facility.
CONTACT	Spyros Pandis (spyros@chemeng.upatras.gr) Christos Kaltsonoudis (kaltsonoudis@iceht.forth.gr)
SERVICE 2 – Characterization of sources and their atmospheric evolution	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Sources tested in the past include diesel and gasoline engines, wood stoves, pellet stoves, barbecues, etc. Both the primary emissions (after dilution) and their evolution during daytime and nighttime reactions are quantified. The user can supply the source to be studied. More information at: http://cstacc.iceht.forth.gr/research-facilities/experimental-facilities/laboratories

ATMOSPHERE TYPE	Controlled or ambient or a combination of the two.
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None in general. Coordination and planning in advance needed for the transportation of the facility.
CONTACT	Spyros Pandis (spyros@chemeng.upatras.gr) Christos Kaltsonoudis (kaltsonoudis@iceht.forth.gr)
SERVICE 3 – Chemical aging experiments for primary and secondary organic aerosol	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Investigations of the evolution of ambient air in different environments. Potential for use of two chambers with changes of the conditions in one of the two with the addition of a pollutant or an oxidant. More information at: http://cstacc.iceht.forth.gr/research-facilities/experimental-facilities/laboratories
ATMOSPHERE TYPE	Controlled or ambient or a combination of the two.
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None in general. Coordination and planning in advance needed for the transportation of the facility.
CONTACT	Spyros Pandis (spyros@chemeng.upatras.gr) Christos Kaltsonoudis (kaltsonoudis@iceht.forth.gr)

5.2 Services provided by the LACROS – Leipzig Aerosol and Cloud Remote Observations System

SERVICE 1 – Instrument Testing & Validation	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Operation of LACROS equipment and/or user-owned equipment to test and/or validate the instrumentation. Based on an agreement between the user and the service provider, the instrument is added to LACROS and its operation is monitored by the service provider (in case of remote access) or by the user (physical access). The LACROS data products are provided for the time period of the TNA.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical & Remote
TARGET USERS	Academia, Private sector
SERVICE STATUS	Available
AVAILABILITY PERIOD	The service is available. Location is subject to change, due to the mobility of LACROS.
TIME CONSTRAINTS	None
CONTACT	Patric Seifert, seifert@tropos.de
SERVICE 2 – Algorithm Testing & Validation	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Application, testing, and/or validation of custom retrieval techniques based on measurements of LACROS. LACROS datasets are provided to the user. It is also possible to create customized data products, in agreement to the needs of the user. Possibilities are, e.g., special operation modes or scan modes of the LACROS instruments.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, Private sector
SERVICE STATUS	Available. Location is subject to change, due to the mobility of LACROS.

AVAILABILITY PERIOD	The service is available. It can either be applied to existing datasets or to observations at the current location of LACROS.
TIME CONSTRAINTS	None
CONTACT	Patric Seifert, seifert@tropos.de
SERVICE 3 – Deployment at user-defined Location	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Deployment of the LACROS suite, or components, at a user-defined custom location. It will require strong coordination between user and service provider.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical & Remote
TARGET USERS	Academia, Private sector
SERVICE STATUS	Available
AVAILABILITY PERIOD	The service is available, but needs to fit into the deployment schedule of LACROS.
TIME CONSTRAINTS	- Must fit into the regular, existing deployment schedule of the site - Deployment duration is at least 4 weeks - Preparation time at least 3 months, but additionally depending on the conditions present at the measurement location and administrative regulations
CONTACT	Patric Seifert, seifert@tropos.de
SERVICE 4 – Case studies of aerosol-cloud-dynamics-precipitation interactions	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	This service aims on providing special, customized datasets to companies (weather forecast, industry, NGOs), research organizations, or policy makers. Based on constraints provided by the user, the service provider screens the dataset for fitting scenarios and provides the requested tailored datasets. This service is also applicable in order to obtain customized datasets about special situations, such as natural hazards (volcanic eruptions, wildfire events, dust outbreaks, special weather situations). It can also find application for evaluation studies of numerical weather simulations.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote

TARGET USERS	Academia, Private sector
SERVICE STATUS	Available
AVAILABILITY PERIOD	The service is available
TIME CONSTRAINTS	None
CONTACT	Patric Seifert, seifert@tropos.de
SERVICE 5 – Training	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Training of users (scientists, private sector) in instrument handling, campaign planning, calibration procedures, or application of algorithms. On-site training as well as virtual training is possible.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Industry, Policy makers
SERVICE STATUS	Available
AVAILABILITY PERIOD	The service is available
TIME CONSTRAINTS	None
CONTACT	Patric Seifert, seifert@tropos.de

5.3 Services provided by the USRL – Unmanned Systems Research Laboratory

SERVICE 1 – Scientific exploration services	
TYPE OF SERVICE	Research, Innovation service
SERVICE DESCRIPTION	USRL focuses on cost-effective UAV (Unmanned Aerial Vehicle) atmospheric applications (vertical profiling, 3D mapping, plume tracking) with miniaturized and lightweight atmospheric sensors fulfilling ACTRIS QA/QC and SOPs (e.g. Aerosol Number Size Concentration, Black Carbon Concentration). It comprises laboratories (150m²) with weather chamber for sensor qualification, specialized mechanical/electronic workshops, as well as a private airfield and permanent airspace (with max ceiling of 3km altitude) located nearby the Cyprus Atmospheric Observatory. USRL includes a large fleet of customized UAVs (fixed and rotary wings) with different payload capacity (up to 10kg) and miniature air sensors. More information at: http://usrl.cyi.ac.cy/ 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).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Academia, business /private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year long
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	Jean Sciare, j.sciare@cyi.ac.cy

6 Detailed list of services provided by Central Laboratories

6.1 Services provided by the DC-ARES, Data Centre Aerosol Remote Sensing Unit

SERVICE 1 – Single calculus cHain for Aerosol Remote sEnsing (SHARE)	
TYPE OF SERVICE	Research, data service
SERVICE DESCRIPTION	The Single Calculus Chain (SCC) provided by the ACTRIS DC-ARES operated by CNR is the centralized processing suite for the processing of aerosol Lidar data. The 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 harmonized and centralized processing allows for faster analysis, traceability and faster developments of advanced products. ACTRIS DC-ARES 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, CNR will offer the SCC use to external users for fostering international cooperation and standardization. The use of the aerosol Lidar processing chain could act as baseline for new products development in the private sector for example at prototype system developments, but even as testing for automatic low power lidar and ceilometer processing delivered by producing SMEs. More information at: http://www.ciao.imaa.cnr.it/, https://scc.imaa.cnr.it
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote access
TARGET USERS	Academia, business /private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year long
TIME CONSTRAINTS	None
CONTACT	Lucia Mona, lucia.mona@imaa.cnr.it

6.2 Services provided by the CARS-ASP-FR, Centre for Aerosol Remote Sensing-Automatic Sun/sky/lunar Photometers

SERVICE 1 – Instrumental development, characterization, calibration, data preparation and processing for aerosols retrievals of automatic sun/sky/lunar photometers	
TYPE OF SERVICE	Technical, Research service
SERVICE DESCRIPTION	The Topical Centre Unit is in charge of instrumental development, characterization, calibration, data preparation and processing for aerosols retrievals of automatic sun/sky/lunar photometers. The facility contributes to the ground-based standardized automatic sun/sky- photometer network AERONET and complements the US NASA calibration centre. The infrastructure consists of photometry and radiometry calibration platforms for calibration of field instruments. The infrastructure holds a mobile platform simulator that allows to test instruments dedicated to mobile observations. Services currently offered by the facility: (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. (iii) training services Current CE318T photometer has the capability to perform measurements on mobile platform, as already done (e.g on ships). However, additional components are requested. Aerosols products derived from AERONET Europe activities have shown to be very useful and relevant for supporting lidar aerosol retrievals, joint photometer LiDAR retrievals (LIRIC and GARRLIC), aerosol absorption profiling, night-time AOD and satellite and model validation. More information at: http://www-loa.univ-lille1.fr/photons
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote access
TARGET USERS	Academia, business /private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year long
TIME CONSTRAINTS	None
CONTACT	Philippe Goloub, philippe.goloub@univ-lille.fr Anne Priem, anne.priem@univ-lille.fr

6.3 Services provided by the CDPS-FTIR, Central Data Processing Systems for FTIR remote sensing data.

SERVICE 1 – Central Data Processing Systems for FTIR remote sensing data	
TYPE OF SERVICE	Technical, Research service
SERVICE DESCRIPTION	The Unit is part of the Topical Centre for Reactive Traces Gases Remote Sensing (CREGARS). CDPS-FTIR is a processing system running on HPC infrastructure at BIRA-IASB, 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). It consists of a S/W chain, of which the heart is a spectral inversion code agreed in CREGARS, with a web-based interface for communication with the users, including upload of level1 data, and access to the processing results (level2 data and associated processing logbook). CDPS-FTIR is under development: a beta version is expected in 2020, a fully operational system by 2022. More information at: https://www.aeronomie.be/ Services currently offered include the central processing of all in-house measurements and of some collaborating stations. The service is available to all external instrument operators in the worldwide FTIR community; most of them are NDACC-affiliated or candidate NDACC affiliates, but also new FTIR operators outside NDACC may appear, e.g., in developing countries (capacity building). There is a strong willingness to have worldwide consistency of the data to enable research that makes use of the global dataset, e.g., for satellite validation. For users of the ACTRIS CDPS-FTIR service, this consistency is automatically ensured and the data will be much more easily integrated in research studies pertaining to the global scale. 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.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote access
TARGET USERS	Academia, business /private sector
SERVICE STATUS	The service is in the testing phase, available in beta version
AVAILABILITY PERIOD	All year long

TIME CONSTRAINTS	None
CONTACT	Martine de Maziere (PI), martine.demaziere@aeronomie.be Bart Dils, Bart.Dils@aeronomie.be Bavo Langerock, bavo.langerock@aeronomie.be,

6.4 Services provided by the CiGAS-CH – Centre for Reactive Trace Gases In Situ Measurements

SERVICE 1 – Organic trace gases (VOC/halocarbons)	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement and calibration for VOCs/halocarbons. These measurements can be used for source allocation and emission estimation of VOCs and halocarbons. EMPA has a long-standing experience in these analyses and is one of the only institutes equipped with analytics and link to international scales for these challenging measurements. Also a combination of these measurements is possible in the canisters.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Stefan Reimann (stefan.reimann@empa.ch)
SERVICE 2 – N2O isotopes	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Measurement and calibration for N2O isotopes. These measurements can be used for source allocation and emission estimation of N2O. EMPA has a long-standing experience in these analyses and is one of the only institutes equipped with analytics and link to international scales for these challenging measurements. Also a combination of these measurements is possible in the canisters.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector

SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Joachim Mohn (joachim.mohn@empa.ch)
SERVICE 3 – @VOC@ QA tool	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	CiGAS-CH provides remote access for the support of users of the @VOC@ tool, used for VOC data quality assessment.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote
TARGET USERS	Academia, business sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Stefan Reimann (stefan.reimann@empa.ch)

6.5 Services provided by the WCCAP – World Calibration Centre for Aerosol Physic

SERVICE 1 – Calibration, Intercomparisons, Audits and Training	
TYPE OF SERVICE	Research, technical service
SERVICE DESCRIPTION	The service consists of: • Quality-assurance of physical and optical in-situ aerosol measurements achieved via instrument intercomparisons, calibration workshops, round-robin test and on-site intercomparisons • Capacity building to perform high-quality physical and optical in-situ aerosol characterization via on-site trainings and trainings in the calibration workshops
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, (remote)
TARGET USERS	Academia, business and public/private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	There are special time slots for the workshops. For more information visit https://www.actris-ecac.eu/schedule.html
CONTACT	Alfred Wiedensohler - ali@tropos.de