Deliverable 9.4: Final list of TNA services contributing to the RI's catalogue of services

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ATMO ACCESS
Access to Atmospheric Research Facilities

Table of Content

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1 Introduction

This document provides the final list of the services offered to users by the 61 facilities providing transnational access (TNA) in the context of the ATMO-ACCESS project (Solutions for Sustainable Access to Prepared in the context of the ATMO-ACCESS project (Solutions for Sustainable Access to Atmospheric Research Facilities). The project supports transnational, physical, and remote access to first-class operational European atmospheric research facilities to help conceive and implement harmonized access procedures and cross-RI access modalities and test the services developed in the project.

The ACTRIS, IAGOS and ICOS Research Infrastructures (RIs)' facilities providing transnational access in ATMO-ACCESS are:

- 29 Observational Facilities (OF), ground-based stations for long-term observations of atmospheric constituents that deliver long-term data based on a regular measurement schedule and common operation standards.
- 14 Simulation Chamber Facilities (SC), used to perform dedicated experiments under controlled conditions.
- 5 Mobile Facilities (MF).
- 13 Central Laboratories (CL), of which 4 are singular CL and 9 are co-located with OF (7), CF (1) and MF (1).

All the research, innovation, and technical services offered by the facilities in ATMO-ACCESS, as well as the new training services developed in WP4, "Developing and optimally integrating joint training services" are listed and described.

This document is meant to contribute to and enhance the participating RI's catalogues of services.

2 ATMO-ACCESS Updated list of services available via TNA

#	Facility type	FACILITY (short name)	LOCATION	SERVICE NAME	TYPE OF SERVICE	TYPE OF ACCESS
1	Obs.	AGORA	Spain, Granada	Campaigns for Aerosol-Cloud Interaction Research	Research service	Physical, remote
2	Obs.	AGORA	Spain, Granada	Experiments for Aerosol-Cloud Interaction Research	Research service	Physical, remote
3	Obs.	AGORA	Spain, Granada	Instrument Testing and Intercomparison Campaigns	Research service	Physical
4	Obs.	AGORA	Spain, Granada	Young Scientists Training	Training service	Physical, remote
5	Obs.	AGORA	Spain, Granada	Training for Companies	Training service	Physical
6	Obs.	AGORA	Spain, Granada	Support to private innovation	Technical service	Physical
7	Obs	ARN	Huelva, Spain	Field Experimental campaigns for atmospheric characterization	Research service	Physical, remote
8	Obs	ARN	Huelva, Spain	Instrument Testing and Intercomparison Campaigns in accordance with ACTRIS and ICOS requirements	Research service	Physical
9	Obs	ARN	Huelva, Spain	Service for training through hands-on-instrument operative and data analysis	Training service	Physical, remote
10	Obs.	ATMOS	Athens, Greece	Access to services of the AThens MOnitoring Supersite / In-Situ Measurements	Research service / Technical service / Training service	Physical, remote
11	Obs.	BCN	Barcelona, Spain	Campaigns for atmospheric chemistry interaction between urban and regional background	Research service	Physical, remote
12	Obs.	BCN	Barcelona, Spain	PTR-MS and PTR-TOF-MS training Service	Training service	Physical, remote
13	Obs.	BCN	Barcelona, Spain	Training for air quality managers and young scientists	Training service	Physical, remote

14	Obs.	BCN	Barcelona, Spain	Instrument Testing and Intercomparison Campaigns	Research service / Technical service	Physical, remote
15	Obs.	BCN	Barcelona, Spain	Training on Aethalometers (AE33 model)	Training service	Physical, remote
16	Obs.	BCN	Barcelona, Spain	Training on source apportionment tools (Positive Matrix Factorization PMF)	Training service	Physical, remote
17	Obs.	CAO	Agia Marina Xyliatou, Cyprus	Access to services of the Cyprus Atmospheric Observatory	Research service / Technical service	Physical, remote
18	Obs.	CESAR	Lopik, the Netherlands	Methane stable isotope analysis ($\delta^{13}C$-CH_4, δD-CH_4)	Research service / Technical service	Remote
19	Obs.	CESAR	Lopik, the Netherlands	Methane clumped isotope analysis ($\Delta^{13}C$-D-CH_4, Δ-D-D-CH_4)	Research service / Technical service	Remote
20	Obs.	CESAR	Lopik, the Netherlands	Carbon monoxide stable isotope analysis ($\delta^{13}C$-CO, $\delta^{18}O$-CO)	Research service / Technical service	Remote
21	Obs.	CESAR	Lopik, the Netherlands	Hydrogen stable isotope analysis (δD-H_2)	Research service / Technical service	Remote
22	Obs.	CESAR	Lopik, the Netherlands	In-situ, column integrated, vertical profiling and spatial atmospheric observations	Data, research, technical, innovation, training service	Physical, remote
23	Obs.	CESAR	Lopik, the Netherlands	Cloud radar calibration	Research, Technical service, Training	Physical
24	Obs.	CESAR	Lopik, the Netherlands	Trace gas remote sensing intercomparison	Research, Technical service, Training	Physical

25	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
26	Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Intercomparison of lidar systems at CIAO	Research service / Technical service	Physical
27	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
28	Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Laboratory characterization of instruments and blocks	Research service / Technical service /Training	Physical
29	Obs	CIAO	CNR-IMAA, Tito (Potenza), Italy	Testing and building lidar configurations	Research service / Technical service	Physical
30	Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena), Bologna	Calibration of chemioluminescence NOx analysers at CMN-PV	Technical service	Physical, remote
31	Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena), Bologna	Calibration of ozone analysers	Technical service	Physical, remote
32	Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, S. Pietro Capofiume (Bologna)	DOAS measurement facility	Research service	Physical, remote
33	Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena), Bologna, S. Pietro Capofiume (Bologna)	In-situ intercomparison for near-surface gas and aerosol analysers	Research service / Technical service	Physical, remote

34	Obs.	Monte Cimone - Po Valley (CMN-PV)	CNR-ISAC, Italy, Monte Cimone (Modena), Bologna, S. Pietro Capofiume (Bologna)	Analysis of atmospheric process by in-situ "near-surface"	Research service / Training service / Data service	Physical, remote
35	Obs	CVAO	Calhau, (Sao Vicente), Cape Verde	Data access, In-situ intercomparison, and calibration for aerosol physical properties and chemical composition	Data/ research/ technology/training/Technical service	Physical, remote
36	Obs.	CVAO	Mindelo, (Sao Vicente), Cape Verde	Cal/Val campaigns in support of satellite atmospheric missions	Data/ Research Service	Physical, remote
37	Obs	CVAO	Mindelo, (Sao Vicente), Cape Verde	Access to the services of the ARS and CRS facility, CVAO, Mindelo, Cape Verde	Data/Research Service	Physical, remote
38	Obs	CVAO	Mindelo, (Sao Vicente), Cape Verde	Instrument Deployment and Testing	Technical Service	Physical
39	Obs.	CO-PDD	Clermont-Ferrand, France	Access to services of the Cézeaux-Aulnat Opme Puy de Dôme station	Research service / Technical service	Physical
40	Obs.	EVASO	Evora, Portugal	Access to services of the Evora Atmospheric Science Observatory	Research service / Technical service	Physical
41	Obs.	FKL	Finokalia, Crete, Greece	Access to services of the Finokalia station	Research service / Technical service / Training Service	Physical, remote
42	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	Campaigns for investigating the properties of sub-Arctic clouds	Research service / Technical service	Physical, remote

43	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	Measuring atmospheric composition of low concentration-, sub-Arctic air	Research service / Technical service	Physical, remote, virtual
44	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	sub-Arctic UAV- base	Research service / Technical service	Physical
45	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	Allergic pollen measurements	Research service	Physical, remote
46	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	Instrument inter-comparisons and field calibrations	Research service / Technical service	Physical, remote
47	Obs.	Pallastunturi facility (**FMI-PAL**) / FMI PAL-SOD	Muonio, Finland	Operation of automated atmosphere super-site and specific instrumentation	Training, Technical, Innovation service	Physical, remote
48	Obs.	Sodankylä facility (**FMI-SOD**) / FMI PAL-SOD	Muonio, Finland	Balloon borne observations	Technical service / Research	Physical
49	Obs	MHD	Mace Head, Ireland	Access to services of the HTM station	Research service / Technical service	Physical
50	Obs.	HTM	Forest in southern Sweden	Access to services of the HTM station	Research service / Training service	Physical, remote
51	Obs.	ISAF - Izaña Observatory (IZO)	Spain, Izaña (Tenerife)	ISAF-Cal Calibration and intercomparison of photometers at IZO	Research, training, technical development	Physical, remote
52	Obs.	ISAF- Izaña Observatory (IZO)	Spain, Izaña (Tenerife)	ISAF-Obs Atmospheric observations in free-troposphere conditions at IZO	Research, campaigns, intercomparisons	Physical (once installed also remote)

53	Obs.	JFJ	Jungfraujoch, Switzerland	Access to services of the high-altitude research station in an environment with frequent occurrence of free tropospheric conditions and clouds	Research service	Physical, remote
54	Obs.	JFJ	Jungfraujoch, Switzerland	Instrument testing and operation in clean environments and under high-altitude (low pressure) conditions	Innovation service / training service	Physical, remote
55	Obs.	Melpitz	Germany, Melpitz	Aerosol physico-chemical properties (ground and vertical)	Data, research, technological, innovation, training service	Physical, remote
56	Obs.	NAOK	Košetice, Czech Republic	Measurement and intercomparison of selected aerosol physico-chemical properties (ground and vertical)	Data, instrumentation, training service	Physical, remote
57	Obs.	OPAR	La Réunion, France	Campaigns for Aerosol-Cloud-Trace gases Interaction Research (ACTRIS & ICOS)	Research service / Technical service	Physical, remote
58	Obs.	OPAR	La Réunion, France	Cal/Val campaigns in support of satellite atmospheric missions (ACTRIS & ICOS)	Research service / Technical service	Physical, remote
59	Obs.	PANGEA (AKY)	NOA, Greece	Instrument Testing & Validation	Research service / Technical service	Physical, remote
60	Obs.	PANGEA (AKY)	NOA, Greece	Algorithm Testing & Validation (RS)	Research service	Physical, remote
61	Obs.	PANGEA (AKY)	NOA, Greece	Cal/Val experiments in support of satellite atmospheric missions (RS)	Research Service	Physical, remote
62	Obs.	PANGEA (AKY)	NOA, Greece	Provision of near real-time aerosol products for model applications (RS)	Research Service	Physical, remote
63	Obs.	PANGEA (AKY)	NOA, Greece	Aerosol-cloud-radiation case studies (RS)	Research service	Physical, remote

64	Obs.	PANGEA (AKY)	NOA, Greece	Training on lidar data analysis and data systems (RS)	Research service / Technical service/Training	Physical, remote
65	Obs.	PANGEA (AKY)	NOA, Greece	Instrument testing (IS)	Research service / Technical service	Physical, remote
66	Obs.	PANGEA (AKY)	NOA, Greece	Aerosol and trace gases (IS) measurements	Research service / Technical service	Physical, remote
67	Obs.	PANGEA (AKY)	NOA, Greece	Training on in-situ measurements (IS)	Training	Physical, remote
68	Obs.	RADO	Magurele, Romania	Aerosol-clouds-radiation studies	Research service	Physical, remote
69	Obs.	RADO	Magurele, Romania	Cal/Val campaigns in support of satellite atmospheric missions	Research Service	Physical, remote
70	Obs.	RADO	Magurele, Romania	Training	Training service	Physical, remote
71	Obs.	RADO	Magurele, Romania	Deployment of mobile reference aerosol Lidar for short-term campaigns	Technical service	Physical
72	Obs.	RADO	Magurele, Romania	Testing of aerosol Lidar prototypes	Technical service	Physical, remote
73	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Intercomparison of instruments for cloud in situ, LWC	Technical service	Physical, remote
74	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Sampling support	Technical service	Physical, remote
75	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Instrument operation	Technical service	Physical, remote

76	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Training	research	physical
77	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Cable car profiles	Technical service	Physical, remote
78	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Data analysis and preparation	data, research	remote
79	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Regional to global backwards modelling with ECMWF-FLEXPART model	Data, research service	remote
80	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Time-series of atmospheric boundary layer heights derived from ceilometer observations	Data, research	remote
81	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Measurement of boundary layer wind and turbulence profiles	Technical service, data, research	remote
82	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Specific weather forecast for Mt. Hoher Sonnblick	Information service	remote
83	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Climate scenarios for Mt. Hoher Sonnblick	Information service	remote

84	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Meteorological consulting	Information service	remote
85	Obs.	Sonnblick Observatory (SBO)	ZAMG, Austria, Rauris (Mt. Hoher Sonnblick)	Avalanche advice and avalanche warning service	Information service	remote
86	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
87	Obs.	SMEAR II	Juupajoki, Finland	Access to services of the Station for Measuring Ecosystem - Atmosphere Relations II	Research service / Technical service	Physical, remote
88	Obs.	SMEAR Estonia	Järvselja, Estonia	Access to services of the Station for Measuring Ecosystem - Atmosphere Relations Estonia	Research service / Technical service	Physical, remote
89	Obs.	Villum	Station Nord, Greenland; Kingdom of Denmark	Long term monitoring of Arctic haze, and campaign studies of Arctic atmospheric chemistry and physics.	Research, campaigns, intercomparisons	Physical
90	Obs.	WOPAS	Wroclaw, Poland	Campaigns for urban air quality	Research	Physical, remote
91	Obs.	WOPAS	Wroclaw, Poland	Atmospheric boundary layer structure	Research	Physical, remote
92	Obs.	WOPAS	Wroclaw, Poland	Instrument Testing and Intercomparison Campaigns	Research / Technical	Physical, remote
93	Obs.	WOPAS	Wroclaw, Poland	Allergic pollen measurements	Research	Physical, remote
94	Obs.	WOPAS	Wroclaw, Poland	Mobile measurements of air quality and meteorological and biometeorological parameters	Research / Technical	Physical, remote
95	Obs.	WOS	Warsaw, Poland	Access to facility for tailored experiments and integration of data using different active, passive and in-situ stationary and mobile instruments at WOS	Research service / Technical service	Physical, remote, hybrid

96	Obs.	WOS	Warsaw, Poland	Access to facility for new technologies / instrumentation testing and optimization	Technical service, research and development service	Physical, remote, hybrid
97	Obs.	WOS	Warsaw, Poland	Access to facility for aerosol typing and long-range transport assessment	Research service	Physical, remote, hybrid
98	Obs.	WOS	Warsaw, Poland	Access to services for urban boundary layer research	Research service	Physical, remote, hybrid
99	Obs.	WOS	Warsaw, Poland	Access to services for tailored experiment	Research/Technica/Monitoring services	Physical, remote, hybrid
100	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
101	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
102	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
103	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
104	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

105	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
106	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
107	Sim. Chamber	AIDA	Karlsruhe, Germany, at KIT Campus North	Exploration of aerosol-cloud-climate processes at the AIDA chamber	Research service	Physical and/or remote access
108	Sim. Chamber	AIDA	Karlsruhe, Germany, at KIT Campus North	Test and intercomparison of (new) instruments	Technical and Innovation service	Physical
109	Sim. Chamber	AURA	Aarhus University, Langelandsgade 140, DK-8000 Aarhus	Experiments in Atmospheric Simulation Chamber	Research service	Mainly physical
110	Sim. Chamber	CESAM	Créteil, France	Scientific research on tropospheric multiphase processes under controlled chamber conditions	Research service, Innovation service	Physical, remote
111	Sim. Chamber	CESAM-CSA	Créteil, France	Investigation of kinetics and mechanisms of gas-phase reactions	Research service, Innovation service	Physical, remote
112	Sim. Chamber	CESAM	Créteil, France	Newly developed instrumentation testing, (inter)calibrations and intercomparisons	Research service, technical service, innovation	Physical, remote
113	Sim. Chamber	CESAM	Créteil, France	Scientific research on aerosol optical properties	Research service	Physical, remote
114	Sim. Chamber	CESAM	Créteil, France	Scientific research on health impact of air pollution through exposition of living organisms	Research service	Physical

115	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Bioaerosol characterization	Research service, technical service, innovation	Physical, remote
116	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Testing and characterization of bioaerosol monitors/sensors	Research service, technical service, innovation	Physical, remote
117	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Measurement of aerosol optical properties	Research service, technical service, innovation	Physical, remote
118	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Testing of samplers and gas/aerosol monitors	Research service, technical service, innovation	Physical, remote
119	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Design, organization and execution of custom experiments	Research service, technical service, innovation	Physical, remote
120	Sim. Chamber	ChAMBRe	INFN, Italy, Genoa	Production, ageing and characterization of atmospheric aerosols	Research service, technical service, innovation	Physical, remote
121	Sim. Chamber	ESC-Q-UAIC	Iași, Romania	Scientific exploration at the ESC-Q-UAIC environmental simulation chamber	Research service	Physical
122	Sim. Chamber	EUPHORE	Paterna, Spain	Scientific research at the EUPHORE atmospheric simulation chamber	Research service	Physical (preferred) remote access
123	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

124	Sim. Chamber	EUPHORE	Paterna, Spain	Technical and innovation services at the EUPHORE atmospheric simulation chamber	Technological service, Innovative service	Physical (preferred) remote access
125	Sim. Chamber	HELIOS	Orléans, France	Scientific exploration at the HELIOS atmospheric simulation chamber	Research service	Physical, remote access
126	Sim. Chamber	IASC	Cork, Ireland	Experimental investigations of atmospheric processes	Research service	Physical, remote
127	Sim. Chamber	IASC	Cork, Ireland	Testing and development of new atmospheric measurement techniques	Research and Innovation service	Physical, remote
128	Sim. Chamber	IASC	Cork, Ireland	Performance testing of sensors and instruments	Technical service	Physical, remote
129	Sim. Chamber	KASCs Kuopio atmospheric simulation chambers	Yliopistonranta 1, 70210 Kuopio, Finland	Scientific atmospheric simulation chamber investigations with various emission sources	Research service	Physical
130	Sim. Chamber	MAC	Manchester, United Kingdom	Scientific exploration at the MAC atmospheric simulation chamber	Research service	Physical, remote
131	Sim. Chamber	MAC	Manchester, United Kingdom	Intercomparison and performance assessment of instrumentation at the MAC atmospheric simulation chamber	Research, Technological service, Innovative service	Physical, remote
132	Sim. Chamber	MAC	Manchester, United Kingdom	Technical and innovation services at the MAC atmospheric simulation chamber	Technological service, Innovative service	Physical, remote
133	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
134	Sim. Chamber	PACS-C2	Villigen, Switzerland	Newly developed instrumentation testing and intercomparisons at PACS-C2	Innovation service	Physical

135	Sim. Chamber	QUAREC	Wuppertal, Germany	Investigation of kinetics and mechanism of gas-phase reaction systems	Research service, training service, technical service	Physical, remote
136	Sim. Chamber	QUAREC	Wuppertal, Germany	Testing of instruments for measuring air quality	Research service, technical service, innovation service	Physical (preferred)and remote
137	Sim. Chamber	SAPHIR	Forschungszentrum Jülich GmbH, Wilhelm-Johnen-Str., 52428 Jülich, Germany	Investigation of atmospheric processes in the gas- and particle phase. Testing and validating instruments.	Research service, Innovation service	Physical access is preferred, remote access can also be provided
138	Mobile	AMP	Sosnowiec, Poland	Access to services of the ACTRIS-Poland Mobile LAB In-situ measurements	Research service / Technical service	Physical, remote
139	Mobile	AMP	Sosnowiec Poland	Access to services of the ACTRIS-Poland Mobile LAB remote sensing measurements	Research service / Technical service	Physical, remote
140	Mobile	FCoMLab	Helsinki and Tampere, Finland	Calibration and station audits	Technical service	Physical, remote
141	Mobile	FComLab	Helsinki and Tampere, Finland	Deployment to user-defined location	Research service	Physical, remote
142	Mobile	FORTH-MSC	Patras (Greece) but can be moved to any location in Europe.	Testing / intercomparisons of new instruments.	Technical service	Physical, remote

143	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
144	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
145	Mobile	LACROS	Leipzig, Germany	Instrument Testing & Validation	Technical service	Physical, remote
146	Mobile	LACROS	Leipzig, Germany	Algorithm Testing & Validation	Research service	Physical, remote
147	Mobile	LACROS	Leipzig, Germany	Deployment at user-defined Location	Research service	Physical, remote
148	Mobile	LACROS	Leipzig, Germany	Case studies of aerosol-cloud-dynamics-precipitation interactions	Research service	Physical, remote
149	Mobile	LACROS	Leipzig, Germany	Training	Training service	Physical, remote
150	Mobile	USRL	Nicosia, Cyprus	Access to services of the USRL Mobile Exploratory Platform	Research service	Physical, remote
151	Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	Organic trace gases (VOC/halocarbons)	Research service, technical service	Remote
152	Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	N2O isotopes	Research service, technical service	Remote
153	Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	@VOC@ QA tool	Training service	Remote
154	Central Lab	CiGAS-CH	Switzerland, Dübendorf [Zürich]	Workshop on sensors and drones	Training service	Physical, Remote

155	Central Lab	ICOS-ATC	Plateau de Saclay, Paris suburb, France	Access to services of the ICOS-ATC Central Laboratory	Research service, technical service	Physical
156	Central Lab	PACC	Prague, Czech republic	Calibration of CPC	Research service, technical service, training service	Physical, remote
157	Central Lab	PACC	Prague, Czech republic	Calibration of MPSS	Research service, technical service, training service	Physical, remote
158	Central Lab	PACC	Prague, Czech republic	Estimation of size resolved particle losses in the parts of sampling line	Research service, technical service, training service	Physical, remote
159	Central Lab	PACC	Prague, Czech republic	Technical audits of the microphysical measurements	Research service, technical service, training service	Physical, remote
160	Central Lab	PACC	Prague, Czech republic	ACTRIS - CAIS-ECAC Aerosol In-Situ Course @NAOK	Training service	Physical
161	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 ARN - ESAt-El Arenosillo

SERVICE 1 – Field Experimental Campaigns for Atmospheric Characterization	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Field experimental campaigns conducted by the user's own devices and/or by the available equipment at ARN. ARN observatory is a remote, experienced and multi-instrumented atmospheric observatory and located in the most western sector of the European continent, at 1 km from Atlantic Ocean and not far from the Mediterranean Sea and the North African coast. It is situated in a protected rural environment (Doñana National Park) surrounded by an extensive area of evergreen Mediterranean pine forest. ARN observatory combines complementary facilities and high-degree of expertise providing an ideal capability for a wide range of atmospheric aerosol and gases research under GAW, ACTRIS and ICOS frameworks. ARN operates under well-established monitoring programs as NASA/AERONET, NASA/MPLNet, NOAA/FAN, EUBREWNET and others. ARN observatory favors synergetic studies by using a variety instrumentation from passive and active remote sensing to a diversity of in-situ methodologies. In addition to the above-ground platform for solar radiation, aerosol, reactive gases and meteorological research, a 100 m-tower is equipped by meteorological sensors and greenhouse gases monitoring at 10, 50 and 100 m. Rotary and medium-size fixed-wind commercial and customized unmanned aerial vehicles (UAV) systems are available for vertical atmospheric composition characterization up 3100 m and in particular, if it is of interest, including several aerosol in-situ payloads and PTU meteorological sensors. Radio- and ozone-soundings can be also performed. ARN observatory has the capacity to provide service for experimental campaigns in the field of atmospheric science beyond our facilities, if it is of interest to the user. ARN observatory also has the ability to provide services when the access is requested to several ATMOS ACCESS facilities simultaneously, thanks to the JRU signed between diverse Spanish organizations dedicated to atmospheric research. Some of these are already participating in ATMOS ACCESS. The service includes: - Access to the technical and research platforms at ARN. - Administrative support for providing access to the facility, a workspace with internet access, and to advice on logistics for equipment transport and users and on accommodation near ARN observatory. - Technical staff support reception and storage of the transport cases, for adapting the facility to assemble the new equipment, for its installation (internet connection, power supply, etc) and for its operation. - Security service. - Synergetic observation of atmospheric aerosol and gases (tracer and greenhouse), meteorological and solar radiation, with comparability with consolidated international networks. - Radio- and/or ozonesondes, if it of interest.

	- Management of the airspace use for UAV flights, and technical and instrumental support for control and communication with UAVs and telemetry data during the mission
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, 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	Margarita Yela (yelam@inta.es), Mar Sorribas (sorribasm@inat.es)
SERVICE 2 – Instrument Testing and Intercomparison Campaigns	
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	Provision of diverse platforms with manifolds equipped with ACTRIS-ICOS compliant sampling systems for in-situ aerosol and reactive and greenhouse gases for exercises of instrument intercomparison. The platforms are hosted in two air-conditioned shelters equipped with internet. Multiple inlets to the sampling systems are available for the external users. Provision also of a 300 m^2 open terrace which overpass the pines canopy providing a 360º free horizon for optical field calibration and a radiometric calibration laboratory (absolute irradiance calibration and instrument characterization). All platforms are equipped with continuous power supply and security service. The service includes: - Access to the intercomparison platforms at ARN. - Administrative support for providing access to the facility, a workspace with internet access, and to advice on logistics for equipment transport and users and on accommodation near ARN observatory. - Technical staff support to reception and storage of the transport cases, for adapting the facility to assemble the new equipment, for its installation (internet connection, power supply, etc) and for its operation. - Provision of calibration or intercomparison reports.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical (once installed also remote)
TARGET USERS	Academia, 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	Margarita Yela (yelam@inta.es), Mar Sorribas (sorribasm@inta.es)
SERVICE 3 – Service for Training through hands-on-instrument operative and data analysis	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	Service for training through hands-on-instrument operative and data analysis in accordance with ACTRIS and ICOS requirements. The service applies to in-situ aerosol measurement techniques (variables defined in ACTRIS), aerosol remote sensing (photometry, zenithal radiation and LIDAR), DOAS technique, reactive and greenhouse (ICOS) gases, solar radiation measurements. The service includes: - Administrative support for providing access to the facility, a workspace with internet access, and to advice on logistics for equipment transport and users and on accommodation near ARN observatory (physical). - Hands-on training for the operation and calibration of the instruments. - Training for the creation of data processing environments, as well as for the use of advanced processing algorithms and tools.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, 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	Margarita Yela (yelam@inta.es), Mar Sorribas (sorribasm@inta.es)

3.3 Services provided by BCN - Barcelona atmospheric research network

SERVICE 1 - Campaigns for atmospheric chemistry interaction between urban and regional background.	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Campaigns organized by local research group at urban (BCN) and background (MSY) stations for research in atmospheric chemistry interactions based on synergistic combination of in-situ techniques at urban background and regional background site in the Western Mediterranean Basin. External research groups are invited to bring their own equipment (remote sensing or in situ) in order to get completeness in the essential variables. At BCN station we count with: SMPS 10-800nm, CPC>10nm, UCPC>3nm, optical particle counter, ACSM, aethalometer, nephelometer, OC/EC, filter sampling and chemical analysis of PM10, PM2.5 and PM1 fractions, gas analyzers (NOx, CO,

	SO2, O3), meteo, PTR-TOF-MS 4000X2, a PTR-TOF-MS Liquid Calibration Unit (LCU) At MSY we count with: SMPS 10-800nm, CPC>10nm, UCPC>3nm, optical particle counter, aethalometer, nephelometer, filter sampling and chemical analysis of PM10, PM2.5 and PM1 fractions, gas analyzers (NOx, CO, SO2, O3), meteo and High resolution PTR-MS The service includes: - Administrative support to comply with internal procedures for accessing facilities (physical). - 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 BCN and MSY 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 and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around
TIME CONSTRAINTS	None
CONTACT	Noemí Pérez (noemi.perez@idaea.csic.es), Cristina Reche (cristina.reche@idaea.csic.es)

SERVICE 2 - PTR-MS and PTR-TOF-MS training Service	
TYPE OF SERVICE	Training Service
SERVICE DESCRIPTION	The BCN site offers expertise and training for PTR-MS and PTR-TOF-MS operation, calibration and data analysis. The service has a Liquid Calibration Unit, a Zero Air generator and several calibration gas standards including a NPL(National Physical Laboratory) PTR-MS mix. This service includes: – Administrative support for the fulfilment of the internal procedures related with the provision of access. – Storing of the equipment at the IDAEA-CSIC 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.
ATMOSPHERE TYPE	Ambient / Controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia and research and innovation centers
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around
TIME CONSTRAINTS	None
CONTACT	Ana Maria Yáñez Serrano (ana.yanez@idaea.csic.es), Roger Seco (roger.seco@idaea.csic.es)

SERVICE 3 - Training for air quality managers and young scientists	
TYPE OF SERVICE	Training Service
SERVICE DESCRIPTION	The BCN site offers expertise and training for all air regulated metrics and parameters (operation of equipment, data quality, data analysis and exploitation). This service includes: – Administrative support for the fulfilment of the internal procedures related with the provision of access. - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). – Scientific and technical support for supervision and analysis of collected data (physical, remote).
ATMOSPHERE TYPE	Ambient / Controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Companies and public authorities, air quality monitoring managers, young scientists
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around
TIME CONSTRAINTS	None
CONTACT	Noemi Perez (noemi.perez@idaea.csic.es), Cristina Reche (cristina.reche@idaea.csic.es)

SERVICE 4 - Instrument Testing and Intercomparison Campaigns	
TYPE OF SERVICE	Research service/Technical service

SERVICE DESCRIPTION	The BCN site offers the support for the testing and intercomparison of instruments for the measurement of air regulated metrics and parameters This service includes: – Administrative support for the fulfilment of the internal procedures related with the provision of access. - Administrative and technical support for providing a workspace for visitors: desk space with computer and internet access, meeting rooms, kitchen and lunch room (physical). – Scientific and technical support for instrument installation and operation and analysis of collected data (physical, remote).
ATMOSPHERE TYPE	Ambient / Controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia and research and innovation centers, air quality networks
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around
TIME CONSTRAINTS	None
CONTACT	Noemi Perez (noemi.perez@idaea.csic.es), Cristina Reche (cristina.reche@idaea.csic.es)

SERVICE 5 - Training on Aethalometers (AE33 model)	
TYPE OF SERVICE	Training Service
SERVICE DESCRIPTION	The BCN site offers expertise and training for Aethalometers (AE33) operation, calibration, maintenance and data analysis. The service has AE33 and AE36s instruments. This service includes: – Administrative support for the fulfilment of the internal procedures related with the provision of access. – Storing of the equipment at the IDAEA-CSIC 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 instrument maintenance, data interpretation and optimal definition of experiment strategy.
ATMOSPHERE TYPE	Ambient / Controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia and research and innovation centers
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around

TIME CONSTRAINTS	None
CONTACT	Marco Pandolfi (marco.pandolfi@idaea.csic.es)

SERVICE 6 - Training on source apportionment tools (Positive Matrix Factorization PMF)	
TYPE OF SERVICE	Training Service
SERVICE DESCRIPTION	The BCN site offers expertise and training for the application of the Positive Matrix Factorization (PMF) tool. This service includes: – Administrative support for the fulfilment of the internal procedures related with the provision of access. – Support and training about the PMF (EPA PMFv5.0) PM source apportionment analysis
ATMOSPHERE TYPE	Ambient / Controlled
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia and research and innovation centers
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year around
TIME CONSTRAINTS	None
CONTACT	Marco Pandolfi (marco.pandolfi@idaea.csic.es)

3.4 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	Technical service, Research
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, private 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 (Δ^{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, private 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, private 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, private 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, 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, 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)

3.5 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, Private sector, 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, Private sector, 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, Private sector, 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, Private sector, 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, Private sector, 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

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

SERVICE 1 - Calibration of chemioluminescence NOx analyzers at CMN-PV	
LOCATION	1) **Italy, Mt. Cimone (Modena)** The "O. Vittori" observatory at Mt. Cimone (44°12' N, 10°42' E, 2165 m a.s.l.), is a research facility managed by the National Research Council of Italy (CNR) and hosted by the Italian Air Force (CAMM). See https://atmo-access.isac.cnr.it/monte_cimone 2) **Italy, Bologna** 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. See https://atmo-access.isac.cnr.it/bologna

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), 5 ppm certified NO standards in N_2. 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 of access. – 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. – For Mt. Cimone: shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m^3 (max: 350 kg) except during snow season. The transport of dangerous goods or larger/heavier materials which need special vehicles is NOT included in the offered services. – For Mt. Cimone: 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, Private sector, 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 for accesses at Mt. Cimone
TIME CONSTRAINTS	**For Mt. Cimone**: 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. **For Bologna**: 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 the presence of CNR personnel.
CONTACT	atmo-access@isac.cnr.it
SERVICE 2 – Calibration of ozone analyzers at CMN-PV	
LOCATION	1) **Italy, Mt. Cimone (Modena)**

	The "O. Vittori" observatory at Mt. Cimone (44°12' N, 10°42' E, 2165 m a.s.l.), is a research facility managed by the National Research Council of Italy (CNR) and hosted by the Italian Air Force (CAMM). See https://atmo-access.isac.cnr.it/monte_cimone 2) **Italy, Bologna** 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. See https://atmo-access.isac.cnr.it/bologna
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 of access. – 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. – For Mt. Cimone: shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m^3 (max: 350 kg) except during snow season. The transport of dangerous goods or larger/heavier materials which need special vehicles is NOT included in the offered services. – For Mt. Cimone: 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, Private sector, 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 for Mt. Cimone.

TIME CONSTRAINTS	**For Mt. Cimone**: 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. **For Bologna**: 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 the presence of CNR personnel.
CONTACT	atmo-access@isac.cnr.it
SERVICE 3 – 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). https://atmo-access.isac.cnr.it/san_pietro_capofiume
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 surface meteorological measurements, in-situ near-surface monitoring of SO_2, near-surface aerosol absorption measurements, aerosol number concentrations by aerosol optical counter (OPC), columnar aerosol properties (sun photometry, ceilometer), and radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). Particulate matter sampling for atmospheric chemical speciation and speciation of non-refractory chemical species (by Aerosol Mass Specrometer, AMS) can be set up during intensive observation periods. A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO_2, HCHO, HONO, Glyoxal, Ozone). Further observations will be implemented during 2025: measurements of number concentration (by twin - DMPS in collaboration with the University of Kuopio), aerosol vertical profiling (lidar), near-surface aerosol scattering measurements, near-surface anthropogenic VOCs. ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone and ammonia, 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 m^2) 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 for 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, and 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. – 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. – Transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m^3 (max: 350 kg). The transport of dangerous goods 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, Private sector, 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 the site only under CNR-ISAC personnel supervision.
CONTACT	atmo-access@isac.cnr.it
SERVICE 4 – In-situ intercomparison for near-surface gas and aerosol analyzers	
LOCATION	**1) Italy, Mt. Cimone (Modena)**

	The "O. Vittori" observatory at Mt. Cimone (44°12' N, 10°42' E, 2165 m a.s.l.), is a research facility managed by the National Research Council of Italy (CNR) and hosted by the Italian Air Force (CAMM). See https://atmo-access.isac.cnr.it/monte_cimone **2) Italy, Bologna** 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. See https://atmo-access.isac.cnr.it/bologna **3) 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). The measurement site is classified as *rural background*. See https://atmo-access.isac.cnr.it/san_pietro_capofiume
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	**Mt. Cimone** 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. Most 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. **Bologna** Provision of an *urban 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 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 m^2) 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 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 equivalent black carbon observations are available by ARPAE-Emilia Romagna at the nearby "Supersito" site. **San Pietro Capofiume** 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 facility is equipped with surface meteorological measurements, in-situ near-surface monitoring of SO_2, near-surface aerosol absorption measurements, aerosol number concentrations by aerosol optical counter (OPC), columnar aerosol properties (sun photometry, ceilometer), and radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). Particulate matter sampling for atmospheric chemical speciation and speciation of non-refractory chemical species (by Aerosol Mass Specrometer, AMS) can be set up during intensive observation periods. A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO_2, HCHO, HONO, Glyoxal, Ozone). Further observations will be implemented during 2025: measurements of number concentration (by twin - DMPS in collaboration with the University of Kuopio), aerosol vertical profiling (lidar), near-surface aerosol scattering measurements, near-surface anthropogenic VOCs. ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone and ammonia, 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 m^2) 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 for 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, and 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 of access. – 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. – 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. – For Mt. Cimone: shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m^3 (max: 350 kg) except during snow season. The transport of dangerous goods or larger/heavier materials which need special vehicles is NOT included in the offered services. – For Mt. Cimone: daily transportation of max 2 users to the infrastructure (during the snow season this cannot be fully guaranteed). Not-UE users equipped with their own car/van must have an International Driving Permit valid in the EU. – For San Pietro Capofiume: 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 the EU. – For San Pietro Capofiume: transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m^3 (max: 350 kg). The transport of dangerous goods or larger/heavier materials which need special vehicles is NOT included in the offered services.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Private sector, 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 for Mt. Cimone.
TIME CONSTRAINTS	**For Mt. Cimone**: 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.

	For Bologna: 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 the presence of CNR personnel. **For San Pietro Capofiume**: 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
CONTACT	atmo-access@isac.cnr.it
SERVICE 5 – Analysis of atmospheric process by in-situ "near-surface" observations	
LOCATION	**1) Italy, Mt. Cimone (Modena)** The "O. Vittori" observatory at Mt. Cimone (44°12' N, 10°42' E, 2165 m a.s.l.), is a research facility managed by the National Research Council of Italy (CNR) and hosted by the Italian Air Force (CAMM). See https://atmo-access.isac.cnr.it/monte_cimone **2) Italy, Bologna** 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. See https://atmo-access.isac.cnr.it/bologna **3) 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). The measurement site is classified as *rural background*. See https://atmo-access.isac.cnr.it/san_pietro_capofiume
TYPE OF SERVICE	Research service /Training service/Data service
SERVICE DESCRIPTION	**Mt. Cimone** 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. Most 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 m^2) 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. **Bologna** 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 m^2) 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 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 equivalent black carbon observations are available by ARPAE-Emilia Romagna at the nearby "Supersito" site. **San Pietro Capofiume** Provision of a rural platform for investigation of atmospheric processes related to reactive and greenhouse gases, aerosol and clouds. The facility is equipped with surface meteorological measurements, in-situ near-surface monitoring of SO_2, near-surface aerosol absorption measurements, aerosol number concentrations by aerosol optical counter (OPC), columnar aerosol properties (sun photometry, ceilometer), and radiative balance and albedo description (solar tracker equipped with radiometers for solar and thermal down-welling radiation). Particulate matter sampling for atmospheric chemical speciation and speciation of non-refractory chemical species (by Aerosol Mass Specrometer, AMS) can be set up during intensive observation periods. A MAX-DOAS system (SkySpec-2D-210) is available at the station (NO_2, HCHO, HONO, Glyoxal, Ozone). Further observations will be implemented during 2025: measurements of number concentration (by twin - DMPS in collaboration with the University of Kuopio), aerosol vertical profiling (lidar), near-surface aerosol scattering measurements, near-surface anthropogenic VOCs. ARPAE Emilia-Romagna runs near-surface measurements of nitrogen oxides, ozone and ammonia, 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 m^2) equipped with fast internet connection which allows for real-time data delivery and remote control of instrumentations. 5 kW. 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 for 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, and 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 of access. – 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. Activation of data delivery service and access to data routinely recorded at the station. – 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. – For Mt. Cimone: shipping to the infrastructure from Bologna (not dangerous goods) for equipment with total volume < 2 m^3 (max: 350 kg) except during snow season. The transport of dangerous goods or larger/heavier materials which need special vehicles is NOT included in the offered services. – For Mt. Cimone: daily transportation of max 2 users to the infrastructure (during the snow season this cannot be fully guaranteed). Not-UE users equipped with their own car/van must have an International Driving Permit valid in the EU. – For San Pietro Capofiume: 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 the EU. – For San Pietro Capofiume: transport to the infrastructure from Bologna (not dangerous goods) for equipment with total volume less than 2 m^3 (max: 350 kg). The transport of dangerous good or larger/heavier materials which need special vehicles is NOT included in the offered services.
ATMOSPHERE TYPE	Ambient

TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Private sector, 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 for Mt. Cimone.
TIME CONSTRAINTS	**For Mt. Cimone**: 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. **For Bologna**: 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 the presence of CNR personnel. **For San Pietro Capofiume**: 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
CONTACT	atmo-access@isac.cnr.it

3.7 Services provided by FKL - Finokalia Station

SERVICE 1 - Access to services of the Finokalia station	
TYPE OF SERVICE	Research service / Technical service / Training service
SERVICE DESCRIPTION	The FKL sampling station (http://finokalia.chemistry.uoc.gr/) is situated on the north coast of Crete, Greece. The station is located at the top of a hilly elevation (250 m a.s.l.) facing the sea within a sector 270o to 90o. No significant human activities occur at a distance shorter than 15km within the above mentioned sector. The area is characterized by the existence of two well-distinguished seasons equally distributed throughout the year: The dry season (from April to September) and the wet season (from October to April). It is located in a unique environment: FKL is in the southernmost region of Europe, with high insolation which favours photochemical activity and fast processing of aerosols. Observations at FKL are related to ACTRIS RI and especially to in situ aerosol characterization. In addition, measurements of gaseous precursors such as O3, NOx, VOCs are also performed. Finally, FKL is member of EMEP, AERONET network and ICOS and e-LTER RIs. The site can be used for research projects, measurement campaigns and training purposes, as well as for comparison and testing of in-situ equipment. Long-term observations of physical and chemical properties of aerosols combine online and offline measurements. Campaigns organized by the ECPL group (https://ecpl.chemistry.uoc.gr/) for research and training (e.g. https://edu4clima.gr; https:///climademy.eu) as well as for equipment testing on in-situ techniques.

	Aerosol and trace gases equipment of FKL can be used as reference for instrument testing, as for instance for air quality sensors (low and medium cost) distributed by the PANACEA–RI (https://air-quality.gr/). Physical access includes use of the facilities, as well as help in the preparatory work and training (if needed), technical and scientific support during the execution (physical or remote after set-up), as well as access to the FKL observational data for science purposes on the basis of collaboration. The services include: - Support for accessing facilities (physical). - Provision of workspace for visitors: desk space and internet access (physical). - Advice for shipping of materials, transportation, reception and storage of equipment. - Advice for managing accommodation. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: set-up support, power connections, internet access, storage, security constraints (physical). - Technical support to remotely operate and audit the external instrumentation (remote after installation). - Training/hands-on for young scientists/research/ technical personnel on in-situ instrumentation (physical) - Educational activities (e.g. experiments for schools) - 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. - Laboratory analysis (e.g. aerosol chemical composition on filters).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical and remote (after installation)
TARGET USERS	Academia, 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	Maria Kanakidou (mariak@uoc.gr), Nikos Mihalopoulos (mihalo@uoc.gr)

3.8 Services provided by FMI PAL-SOD - Pallas-Sodankylä Atmospheric Ecosystem Supersite

3.8.1 Pallastunturi facility (FMI-PAL)

SERVICE 1 – Campaigns for investigating the properties of sub-Arctic clouds	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The "Pallas Cloud Experiments" (PACE's) are 6-8 weeks long campaigns taking place at the Pallastunturi facility annually or bi-annually, from the beginning of September until November-December. During this period, the region at Pallas has a high fraction of low-level clouds, which reside at the altitude of the main measurement station, Sammaltunturi. This enables comprehensive studies that can be built around direct *in situ* observations of clouds. At PAL, the infrastructure and continuous measurements offer a strong capacity that support specialized campaigns. The Sammaltunturi station is equipped with total- and interstitial aerosol inlets which host continuous measurements of aerosol physical and optical properties. The inlets have a provision for additional campaign measurements. The station has continuous measurements of cloud droplet microphysical properties, and comprehensive meteorological measurements are conducted. In addition to the Sammaltunturi station, Pallas hosts below-cloud infrastructure including for example cloud remote sensing measurements and measurements for radiation balance, cloud base height and boundary layer height. Most importantly, at Pallas, an airspace up to 2km altitude is reserved for research flights, offering possibilities to utilize e.g. UAV- based measurements and tethered balloon systems. Flying beyond visual line of sight is permitted, making vertical measurements through clouds possible. The campaigns offer a relatively inexpensive opportunity to gather comprehensive data of sub-Arctic clouds, one of the most uncertain pieces of the global climate change puzzle.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Annually, end of August to beginning of December
TIME CONSTRAINTS	Early December is a challenging period for moving heavy equipment to/from the station
CONTACT	David Brus (David.brus@fmi.fi) Konstantinos Doulgeris (konstantinos.doulgeris@fmi.fi) Eija Asmi (eija.asmi@fmi.fi)
SERVICE 2 – Measuring atmospheric composition of low concentration-, sub-Arctic air	
TYPE OF SERVICE	Research service, Technical service

SERVICE DESCRIPTION	The ambient air in Pallastunturi is amongst the cleanest in the World, with particle number concentrations reaching levels of 10 #/cm3 during cold winter days, and up to a few thousand #/cm3 during strong biological activity in the summer. This provides an excellent opportunity to study the atmospheric composition of sub-Arctic air, where climate change is affecting the atmospheric composition rapidly. In addition to research services, the station offers excellent possibilities for instrument development and -testing in the low concentration, Arctic setting. Virtual Access is offered to continuous measurements conducted for ACTRIS aerosol in situ-, trace gases in situ-, cloud in situ- and cloud remote sensing measurements. Pallastunturi also hosts an air quality background supersite fulfilling the requirements of the new European air quality guidelines. Physical- and remote Access for installing additional instruments at the station is provided.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote, Virtual
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	Eija Asmi (eija.asmi@fmi.fi) Antti Hyvärinen (antti.hyvarinen@fmi.fi) David Brus (david.brus@fmi.fi)

SERVICE 3 – sub-Arctic UAV- base	
TYPE OF SERVICE	Research Service, Technical service
SERVICE DESCRIPTION	The Pallastunturi facility offers a designated air space for research flights with e.g. UAV's and tethered balloon systems. The airspace is horizontally 7km*7km, with 2km ceiling altitude above ground level. Flying beyond visual line of sight is permitted, making vertical measurements through clouds possible. Physical access is provided to operate user's own airborne platforms, or utilizing measurements with the FMI's UAV- fleet. FMI's measurements encompass ACTRIS aerosol in situ-, and cloud in situ measurements, as well as meteorological parameters. Operations are supported by continuous measurements of e.g. surface meteorological conditions, cloud base height, boundary layer height and cloud remote sensing observations. The Sammaltunturi station measurements (565 a.s.l.) can be used as reference to airborne observations. The opportunity is ideal for research on the vertical distribution of atmospheric composition in the sub-Arctic as well as instrument testing.
ATMOSPHERE TYPE	Ambient

TYPE OF ACCESS	Physical
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	David Brus (david.brus@fmi.fi)
SERVICE 4 – Allergic pollen measurements	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Continuous real-time measurements of plant pollen in the background sub-Arctic atmosphere. The measurements are conducted with in-situ observations (using the Swissens Poleno Jupiter automatic pollen analyzer).
ATMOSPHERE TYPE	ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, 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	Eija Asmi (eija.asmi@fmi.fi) Mikhail Sofiev (mikhail.sofiev@fmi.fi)
SERVICE 5 – Instrument inter-comparisons and field calibrations	
TYPE OF SERVICE	Research service, Technical service
SERVICE DESCRIPTION	The comprehensive set of aerosol research instrumentations at the site can be used in intercomparisons of aerosol- and in-situ cloud instruments. The site has availability of field calibration equipment and a selection of calibration aerosols to perform field calibrations and intercomparison experiments of standard optical and size segregated aerosol measurements. Technical support for such exercises is also available.
ATMOSPHERE TYPE	Controlled or ambient or a combination of the two
TYPE OF ACCESS	Physical, 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	Eija Asmi (eija.asmi@fmi.fi) Henri Servomaa (henri.servomaa@fmi.fi)
SERVICE 6 – Operation of automated atmosphere super-site and specific instrumentation	
TYPE OF SERVICE	Training, technical, innovation service
SERVICE DESCRIPTION	The site has a long history of state of the art, automated atmospheric measurements, with over 30 years of experience in operating in a remote, cold environment. Visitors from diverse backgrounds are invited to learn this know-how from the establishment of the site to its continuous operation, including practical hands-on training of specific instrumentation and practices related with instrument handling, sampling and station logistics. More information at: https://en.ilmatieteenlaitos.fi/pallas-atmosphere-ecosystem-supersite
ATMOSPHERE TYPE	ambient
TYPE OF ACCESS	Physical, 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	Antti Hyvärinen (antti.hyvarinen@fmi.fi) Eija Asmi (eija.asmi@fmi.fi)

3.8.2 Sodankylä facility (FMI-SOD)

SERVICE 1 – Balloon borne observations	
TYPE OF SERVICE	Technical service, Research

SERVICE DESCRIPTION	Sodankylä: The Finnish Meteorological Institute's (FMI) Sodankylä facility (67°22' N, 26°39' E) hosts programs exploring upper air chemistry and dynamics, atmospheric column and profile measurements, snow/soil hydrology, biosphere-atmosphere interaction and satellite calibration-validation studies. The Sodankylä station contributes to Aeronet, NDACC, TCCON, GRUAN and other networks. At Sodankylä infrastructure is available for various atmospheric measurements. The services include: - support for in situ balloon borne measurements of atmospheric composition. Examples are balloon-borne observations of atmospheric trace gases and aerosol properties. Regular radiosonde profiles are taken twice per 24 hours, at noon and at midnight. It is also possible to increase frequency of automated sonde launches for special observational periods. - auxiliary ground-based observations are performed by various spectrometers dedicated to atmospheric composition measurements.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, private 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	Rigel Kivi (rigel.kivi@fmi.fi), Antti Hyvärinen (antti.hyvarinen@fmi.fi)

3.9 Services provided by 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, 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	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, 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	Natalia Prats (npratsp@aemet.es)

3.10 Services provided by JFJ - Jungfraujoch high-altitude research station

SERVICE 1 - Access to services of the high-altitude research station in an environment with frequent occurrence of free tropospheric conditions and clouds	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The Jungfraujoch research station is ideally suited for continuous measurements and intensive field experiments in a high-altitude environment. The site is ideally suited to investigate i) composition and processes in the lower free troposphere, ii) properties of liquid and mixed-phase clouds and their interactions with aerosols and trace gases. iii) aged pollution and long-range transported plumes. External research groups are invited to bring their own equipment complementing the broad range of already existing observations. The research groups operating the continuous monitoring at Jungfraujoch can also provide additional research equipment for intensive experiments. (More information at: https://www.actris.ch/) The service includes: ● Support in aligning the experiment design with research questions and local conditions. ● Support in data interpretation in context of the peculiarities of the remote high-altitude environment. ● Logistical support for the entire life-cycle of the experiment. ● Lab facilities and outdoor platforms. ● Accommodation at the research station operated by the foundation High Altitude Research Stations Jungfraujoch & Gornergrat (https://www.hfsjg.ch/en/home/).
ATMOSPHERE TYPE	Ambient, often free troposphere and frequently in clouds
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	Martin Gysel-Beer (martin.gysel@psi.ch); https://www.actris.ch/

SERVICE 2 – Instrument testing and operation in clean environments and under high-altitude (low pressure) conditions	
TYPE OF SERVICE	Innovation service / training service
SERVICE DESCRIPTION	The free tropospheric air masses (low concentrations), high altitude (low pressure), cold temperatures (for outdoor instruments), frequent clouds

	(including supercooled liquid and mixed-phase clouds) pose many challenges for research equipment and often require adaptation of calibration, operation and data processing procedures. These boundary conditions, along with a comprehensive suite of continuous observations of many atmospheric variables (https://www.actris.ch/) make the site an ideal platform for testing performance of new and specifically adapted equipment, as well as for training of instrument operators. The service includes: ● Support in preparing the experimental setup for instrument testing. ● Training for calibration and operation of research equipment under the high-altitude conditions. ● Provision of reference data from established observations. ● Lab facilities and outdoor platforms. ● Logistical support ● Accommodation at the research station operated by the foundation High Altitude Research Stations Jungfraujoch & Gornergrat (https://www.hfsjg.ch/en/home/).
ATMOSPHERE TYPE	Ambient, often free troposphere and frequently in clouds
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Instrument manufacturers and Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Martin Gysel-Beer (martin.gysel@psi.ch); https://www.actris.ch/

3.11 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, 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)

3.12 Services provided by the National Atmosperic Observatory Košetice

SERVICE 1 - Measurement and intercomparison of selected aerosol physico-chemical properties (ground and vertical)	
TYPE OF SERVICE	Data, instrumentation, training service
SERVICE DESCRIPTION	The technical solution for measurement in extreme high levels. Possibility to test specialized instrumentation in demanding conditions (shocks, vibrations, vertical gradients) of a 250 m high tall tower. The instrumentation can be placed on individual measuring platforms (8 m, 50 m, 125 m, 230 m), the instrument dimensions are limited by platform size and lift capacity. Testing of the instrumentation by the unmanned aerial system (UAS). Possibility to use own UAS (necessary to comply with the legal regulations and laws of the Czech Republic, including insurance) within the specific conditions close to the tall tower. There is an option to compare/calibrate measurement parameters with regular tall tower data sets (meteorology, greenhouse gases, physical and chemical properties of aerosols, cloud mapping, etc.). Opportunity to use the NAOK´s infrastructure fenced and secured area - sampling platforms, power supply, concrete platforms for sampling. Providing results from online measurements –NO-NOX-NO2, SO2, PM10, PM2.5, CO, physical and chemical properties of aerosol particles. Results availability from offline measurements - PM10, PM2.5, PM1, chemical composition - cations (PM2.5), anions (TSP), EC/OC (PM2.5), PAHs, heavy metals (PM10, PM2.5). Accommodation directly at NAOK in rooms with private bathrooms (12 double rooms) with the possibility of local non-vegetarian food :o), use of seminar room with the capacity of 20 people, availability of small kitchen with limited equipment. More information about measurement is here: https://actris.cz/web/data-and-measurement/

ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, private sector, public sector
SERVICE STATUS	The service is available
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	RNDr. Adéla Holubová Šmejkalová PhD. (adela.holubova@chmi.cz) Dr. Jakub Ondráček (onracek@icpf.cas.cz)

3.13 Services provided by OPAR – Observatoire de Physique de l'Atmosphère à La Réunion

SERVICE 1 - Campaigns for Aerosol-Cloud-Trace gases Interaction Research	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Campaigns for research in aerosol-cloud-trace gases interaction based on synergistic combination of remote sensing and in-situ techniques (ACTRIS & ICOS). 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 OPAR equipment list). Additional instruments from the users can be accommodated indoor or outdoor, as needed. Overflights with probe balloons, drones and small research aircrafts possible. More information at: https://www.osureunion.fr/en/observation-stations/opar/presentation/ 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 at Maïdo Observatory (six rooms). - 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 external research group 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 and Remote
TARGET USERS	Academia
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round except July 14th to August 15th, and December 19th to January 19th
TIME CONSTRAINTS	None
CONTACT	Olivier Magand (Olivier.magand@univ-reunion.fr) and Yann Hello (yann.hello@univ-reunion.fr)

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 OPAR premises, using OPAR's infrastructure and user's own instrumentation. Examples of experimental campaigns that have already taken place concern ADM-Aeolus (wind) and Earth Care (aerosols). The infrastructure at OPAR combines ACTRIS compliant aerosol remote sensing, trace gases remote sensing, cloud remote sensing and aerosol in-situ instrumentation (ACTRIS & ICOS), along with complementary measurements for meteorological parameters and radiation (check OPAR equipment list). Additional instruments from the users can be accommodated indoor or outdoor, as needed. Overflights with probe balloons, drones and small research aircrafts possible. In addition to Service 1 (see previous table), 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	Ambient
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 except July 14th to August 15th, and December 19th to January 19th

TIME CONSTRAINTS	None
CONTACT	Michael Sicard (Michael.Sicard@univ-reunion.fr) and Yann Hello (yann.hello@univ-reunion.fr)

Measured parameters at OPAR:

OPAR hosts and operates 51 instruments, including 6 large passive and active remote sensing instruments.

Two Fourier Transform Infrared Spectrometers (FTIR) belonging to the Belgian Institute for Space Aeronomy (IASB) and four lidars developed in partnership with LATMOS measure partial columns (FTIR) and profiles (lidars) of physical parameters (wind and temperature) and chemical parameters (aerosols, water vapor, ozone and other infrared-absorbing trace gases such as carbon monoxide, hydrogen cyanide, ethane, acetylene, formaldehyde, methanol and formic acid).

The atmospheric layers surveyed range from the lower troposphere to the thermosphere, depending on the parameters considered. Since 2012, thanks to the participation of the Laboratoire de Météorologie Physique (LaMP), the Cyprus Institute and the Laboratoire des Sciences du Climat et de l'Environnement (LSCE), OPAR has been equipped with an extensive array of in-situ observation resources for determining the chemical gas composition, water vapor isotopy and dimensional, optical and chemical properties of aerosols.

A set of spectroradiometric instruments enables us to observe the different components of the solar spectrum (from infrared to ultraviolet), and are key elements in studies to monitor the integrated quantity of ozone and aerosols, their radiative impact on the ground, and the influence of UV on health. On a tropical island where convective and cyclonic activity can be very intense, clouds and hydrometeors are studied using Doppler radar and disdrometers. Finally, balloon-borne probes are released on a regular basis or during campaigns to document the precise vertical distribution of ozone, water vapour, temperature and aerosols from the ground to the stratosphere.

Unique in the Southern Hemisphere and one of the most comprehensive in the world, this array of instruments provides high-quality data for satellite calibration and validation, climate monitoring in the Southern Hemisphere, the study of the physical and chemical processes involved, and the improvement of climate forecasting models.

OPAR, and in particular the Maïdo observatory, is also designed to host scientific and technical teams for the installation of instruments over long periods, as well as for the conduct of intensive campaigns on this unique tropical site. Since the beginning of 2013, 32 campaigns have been carried out in collaboration with 19 French and foreign laboratories.

Non-exhaustive table of OPAR instruments with their range, measured parameters and installation site.

INSTRUMENTS	LOCATION	MEASURED PARAMETERS	SCOPE
CIMEL solar photometer	Saint-Denis	Optical and physical properties of aerosols	Integrated column
Bentham spectroradiometer	Saint-Denis	UV solar spectrum	Integrated column
SAOZ	Saint-Denis	Quantity of O3, NO2	Integrated column
FTIR	Saint-Denis	Quantity of greenhouse gases (partial columns)	Troposphere and stratosphere

INSTRUMENTS	LOCATION	MEASURED PARAMETERS	SCOPE
Mobile Aerosol Lidar	Saint-Denis	Aerosol backscatter and extinction profiles	Troposphere
BASTA Radar	Saint-Denis	Cloud properties (radar reflectivity, Doppler velocity)	Troposphere
Disdrometer 2DVD	Saint-Denis	Drop size distribution	In situ
PICARRO 3G	Saint-Denis	Concentration of greenhouse gases (CO2, CH4, H2O)	In situ
Radiosurveys (MODEM+ECC)	Gillot	Profiles of relative humidity, temperature, wind, O3 concentration	Troposphere and stratosphere
PICARRO 4G	Maïdo	Concentration of greenhouse gases (CO, CO2, CH4, H2O)	In situ
SO2 analyzer	Maïdo	SO2 concentration (UV fluorescence)	In situ
O3 analyzer	Maïdo	O3 concentration (UV absorption)	In situ
Aethalometer	Maïdo	Concentration of optically absorbing particles ("soot carbon")	In situ
Nephelometer	Maido	Aerosol 3 wavelength scattering and backscattering (450 Blue, 525 Green and 635 Red) measurements	In situ
Chemical filters	Maïdo	EC-OC	In situ
Condensation Particle Counter	Maïdo	Aerosol number concentration	In situ
Differential Mobility Particle Sizer	Maïdo	Aerosol number concentration and size distribution (2.5-900nm)	In situ
Optical Particle Sizer	Maïdo	Aerosol number concentration and size distribution (0.3-10µm)	In situ
Cloud Condensation Nuclei Counter	Maïdo	Number concentration of cloud condensation nuclei	In situ
PICARRO H2O	Maïdo	Specific humidity and water vapor isotope ratio	In situ
Radiometer j(NO2)	Maïdo	NO2 photolysis frequency	In situ
NOy spectrometer	Maïdo	NOy concentration	In situ
FTIR	Maïdo	Quantity of greenhouse gases (partial columns)	Troposphere and stratosphere
Stratospheric O3 Lidar	Maïdo	O3 concentration profiles	Stratosphere
Tropospheric O3 Lidar	Maïdo	O3 concentration profiles	Troposphere
Tropospheric O3 Lidar	Maïdo	Aerosol backscatter and extinction profiles	Troposphere et stratosphere
LIDAR1200	Maïdo	Temperature profiles	Troposphere-lower stratosphere
LIDAR1200	Maïdo	Aerosol backscatter and extinction profiles	Stratosphere-thermosphere

INSTRUMENTS	LOCATION	MEASURED PARAMETERS	SCOPE
LIDAR1200	Maïdo	Aerosol backscatter and extinction profiles	Troposphere and stratosphere
Wind Lidar	Maïdo	Horizontal wind speed profiles	Troposphere and stratosphere

3.14 Services provided by PANGEA (AKY) - PANhellenic GEophysical observatory of Antikythera

SERVICE 1 - Instrument Testing & Validation (RS)	
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	Operation of the aerosol lidar located at the PANGEA station and the user's own lidar instrument for testing and validation purposes while following the ACTRIS protocols for lidar measurements procedures and data quality assurance and quality control. The service includes: ● Administrative support for the deployment and installation of the user's instrument at the PANGEA premises ● Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment (e.g. power connections, remote access, storage, internet network). ● Operation of the PANGEA lidar and provision of lidar products for the comparison with the lidar to be tested/validated ● Scientific support for supervision and analysis of collected data (physical or remote)
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Private sector
SERVICE STATUS	Available
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	On-site lidar intercomparison in spring & summer
CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 2 - Algorithm Testing & Validation (RS)	
TYPE OF SERVICE	Research service

SERVICE DESCRIPTION	Application, testing, and validation of the user's custom algorithm for lidar data processing and product retrievals based on lidar measurements from PANGEA instrumentation. The possibility to include testing of the algorithm based on simulated lidar signals (e.g. from an EARLINET algorithm intercomparison exercise) is also provided. The service includes: ● Provision of lidar measurements from PANGEA station ● Support in the processing and analysis of raw lidar data from the PANGEA instrumentation ● Support in the algorithm testing/validation using simulated lidar signals
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, Private sector
SERVICE STATUS	Available
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 3 - Cal/Val experiments in support of satellite atmospheric missions (RS)	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Short and long-term experimental Cal/Val campaigns at PANGEA premises, using PANGEA's infrastructure and user's own instrumentation. The infrastructure at PANGEA includes ACTRIS compliant aerosol and cloud remote sensing instrumentation, along with complementary measurements for meteorological parameters and radiation. Additional instruments from the users can be also accommodated indoor or outdoor, as needed. The service includes: ● Data collection and data analysis of the PANGEA instrumentation ● Administrative and technical support on the (de)mobilization, installation, and operation of the user's instrumentation ● Support from the scientific staff to collect, process and analyze the data. ● Support from the scientific staff to set the measurements schedule coincident with satellite overpasses
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, space agencies and organizations (e.g. ESA, EUMETSAT)

SERVICE STATUS	Available
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 4 - Provision of near real-time aerosol products for model applications (RS)	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Provision of lidar products in a near real-time window (e.g. within 3 hrs from measurement time) to a repository for use in model applications (e.g. Copernicus Atmosphere Monitoring Service). The service includes: ● Data analysis of the PANGEA lidar measurements in near real-time ● Data provision in near real-time to an online repository to be used as input in model applications (e.g. CAMS)
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia
SERVICE STATUS	Available
AVAILABILITY PERIOD	all year round
TIME CONSTRAINTS	None
CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 5 - Aerosol-cloud-radiation campaigns and case studies (RS)	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Identification and provision of customized datasets from PANGEA measurements focusing on aerosol-cloud-radiation interactions based on synergistic combination of remote sensing datasets and user constraints. 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. Additionally, external research groups are invited to bring their own equipment (remote sensing or in situ) in order to get completeness in the essential variables for short and long-term experimental campaigns at PANGEA premises. The infrastructure at PANGEA combines ACTRIS compliant aerosol and cloud remote sensing instrumentation, along with complementary measurements for meteorological parameters and radiation.

	The service includes: ● Support from the scientific staff to process and analyze the PANGEA data. ● Additionally, for the experimental campaigns: ○ Administrative support for the deployment and installation of the user's instrument at the PANGEA premises ○ Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment (e.g. power connections, remote access, storage, internet network). ○ Support from the technical staff to install and operate the user's instruments
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia
SERVICE STATUS	Available for ACTRIS aerosol remote sensing. For ACTRIS cloud remote sensing and radiation available from 2027.
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 6 - Training on lidar data analysis and data systems (RS)	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Training on using NOA's custom algorithm for lidar data analysis. The NOA algorithm is capable of processing the lidar signals and retrieving the lidar products: profiles of the aerosol and thin clouds optical properties (e.g. particle backscatter and extinction coefficients, lidar ratio, depolarization ratio), water vapor mixing ratio, Angstrom exponent. The service includes: ● Training on using NOA's custom algorithm for lidar data analysis and product retrievals
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia
SERVICE STATUS	Available
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None

CONTACT	Vassilis Amiridis (vamoir@noa.gr), Eleni Marinou (elmarinou@noa.gr)

SERVICE 7 - Instrument testing (IS)	
TYPE OF SERVICE	Research service / Technical service
SERVICE DESCRIPTION	The remote island of Antikythera in Greece, is a unique marine observatory, being frequently affected by desert dust outbreaks while no significant human activities occur at a distance shorter than 70 km from the site. The site is designed to be operational after 2026 for aerosol and trace gases (including greenhouse gases) in situ atmospheric measurements by combining state of the art online and offline techniques (sampling). Currently, equipment from ATMOS-NOA is transferred to the site by means of the NOA mobile unit to cover the access needs. Trips to the island on at least a monthly basis, for 2-3 days, are required for instrument maintenance/calibration. The site can be used for comparison and testing of in-situ equipment. The available equipment of ATMOS-NOA is used in combination with external equipment if needed (external groups are invited to bring their own equipment). Physical access includes use of the facilities, as well as help in the preparatory work, and technical and scientific support during the execution (physical or remote after set-up). The services include: - Support for accessing facilities (physical). - Provision of workspace for visitors: desk space and internet access (physical). - Advice for shipping of materials, transportation, reception and storage of equipment. - Advice for managing accommodation near the site. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: set-up support, power connections, internet access, storage, security constraints (physical). - Technical support to remotely operate and audit the external instrumentation (remote after installation). - 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 and remote (after installation)
TARGET USERS	Academia, public and private sector, international organizations
SERVICE STATUS	The service will be offered after 2026. The service is currently provided depending on the ATMOS-NOA equipment availability (transport of instruments from Athens to Antikythera).

AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None for remote access. Limited physical access during the November-March period.
CONTACT	Georgios Grivas (ggrivas@noa.gr), Eleni Liakakou (liakakou@noa.gr), Nikos Mihalopoulos (nmihalo@noa.gr)

SERVICE 8 - Aerosol and trace gases (IS) measurements	
TYPE OF SERVICE	Research
SERVICE DESCRIPTION	The remote island of Antikythera in Greece, is a unique marine observatory, being frequently affected by desert dust outbreaks while no significant human activities occur at a distance shorter than 70 km from the site. The site can be used for research projects on aerosol and trace-gases in-situ measurements. The site is designed to be operational after 2026 for aerosol and trace gases (including greenhouse gases) in situ atmospheric measurements by combining state of the art online and offline techniques (sampling). Currently, equipment from ATMOS-NOA is transferred to the site by means of the NOA mobile unit to cover the access needs. External groups are invited to bring their own equipment. Trips to the island on at least a monthly basis, for 2-3 days, are required for instrument maintenance/calibration. Physical access includes use of the facilities, as well as help in the preparatory work, and technical and scientific support during the execution (physical or remote after set-up). The services include: - Support for accessing facilities (physical). - Provision of workspace for visitors: desk space and internet access (physical). - Advice for shipping of materials, transportation, reception and storage of equipment. - Advice for managing accommodation near the site. - Technical support at the facility to fulfill visitor needs and constraints related to installation, deployment and operation of equipment: set-up support, power connections, internet access, storage, security constraints (physical). - Technical support to remotely operate and audit the external instrumentation (remote after installation). - 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 and remote (after installation)
TARGET USERS	Academia, private sector, international organizations

SERVICE STATUS	The service will be offered after 2026. The service is currently provided depending on the ATMOS-NOA equipment availability (transport of instrument from Athens to Antikythera).
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None for remote access. Limited physical access during the November-March period.
CONTACT	Georgios Grivas (ggrivas@noa.gr), Eleni Liakakou (liakakou@noa.gr), Nikos Mihalopoulos (nmihalo@noa.gr)

SERVICE 9 - Training on in-situ measurements (IS)	
TYPE OF SERVICE	Training service
SERVICE DESCRIPTION	The remote island of Antikythera in Greece, is a unique marine observatory, being frequently affected by desert dust outbreaks while no significant human activities occur at a distance shorter than 70 km from the site. The site can be used for training purposes on aerosol and trace-gases in-situ measurements. The site is designed to be operational after 2026 for aerosol and trace gases (including greenhouse gases) in situ atmospheric measurements by combining state of the art online and offline techniques (sampling). Currently, equipment from ATMOS-NOA is transferred to the site by means of the NOA mobile unit to cover the access needs. Training can be offered during research projects and/or instrument testing/comparison (physical access). The service includes: - Support for accessing facilities (physical). - Advice for managing accommodation near the site. - Provision of workspace for visitors: desk space and internet access (physical). - Training/hands-on for young scientists/research/ technical personnel on in-situ instrumentation (physical) - Scientific support for supervision and analysis of collected data (physical, remote).
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical (during research projects and /or instrument testing/comparison) and remote
TARGET USERS	Academia, private sector, young scientists/research/ technical personnel
SERVICE STATUS	The service will be offered after 2026. The service is currently provided depending on the ATMOS-NOA equipment availability (transport of instrument from Athens to Antikythera).
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None for remote access. Limited physical access during the November-March period.
CONTACT	Georgios Grivas (ggrivas@noa.gr), Eleni Liakakou (liakakou@noa.gr), Nikos Mihalopoulos (nmihalo@noa.gr)

3.15 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, Private sector, 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)

3.16 Services provided by 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, private sector, 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, 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	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, 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	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, private sector, 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, private sector, 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, private sector
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, private sector
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, private sector
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, Private sector, 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, Private sector, 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, Private sector, 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, Private sector, 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)

3.17 Services provided by WOPAS - Wrocław Observatory Platform for Atmospheric Studies

SERVICE 1 - Campaigns for urban air quality	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Measurement campaigns enabling the determination of atmospheric aerosol properties using in situ measurements (aethalometer, nephelometer, ultrafine and fine particle distribution spectrometers) and remote sensing techniques (high-power aerosol lidar, photometers) allow for the characterization of aerosol properties. These measurements will be supplemented with data on the concentrations of gaseous pollutants, such as NOx (NO, NO2), ozone, suspended particulate matter (PM10, PM2.5), and aerosol chemical composition analysis based on gravimetric measurements. At the WOPAS platform, comprehensive meteorological measurements are conducted, including the radiation balance in the longwave and shortwave ranges, precipitation intensity and type using an optical disdrometer, wind speed and direction, and temperature gradient measurements up to 14 m above ground level on a meteorological tower. Additionally, the structure of the lower part of the boundary layer is studied using SODAR. Furthermore, the WOPAS team has extensive experience in modeling atmospheric processes using models such as WRF, WRF-Chem, EMEP, u_EMEP, and ADMS. Methods for applying machine learning in air quality modeling are also being developed. The campaigns provide data for urban air quality assessments, enabling evidence-based decisions for e.g. health impact assessment, air quality management, and deeper insight into processes favoring haze events.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, 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	Anetta Drzeniecka-Osiadacz (anetta.drzeniecka-osiadacz@uwr.edu.pl) Tymoteusz Sawiński (Tymoteusz.sawinski@uwr.edu.pl)
SERVICE 2 – Atmospheric boundary layer structure	
TYPE OF SERVICE	Research service

SERVICE DESCRIPTION	The atmospheric boundary layer (ABL) is one of the fundamental part of the atmosphere influencing e.g. air quality, substance transport, etc. In middle latitudes, during radiative weather conditions, it is characterized by typical variability resulting from changes in the radiative balance. Despite the importance of proper parameterization of the boundary layer, particularly in determining the depth of the mixing layer, errors generated by meteorological models can reach up to 100%. Therefore, it is especially crucial to develop an appropriate methodology to fully describe the dynamics of the ABL. The goal of the measurement experiment is to integrate lidar, sodar, drone, and ground-based measurements to verify assumptions regarding the depth of the mixing height and validate results from atmospheric models. At WOPAS, continuous measurements are conducted using high-power aerosol lidar, monostatic Doppler minisodar, vertical profile measurements with a prototype measurement head installed on a drone, and comprehensive meteorological observations. The integration of multiple measurement methods ensures a robust understanding of ABL dynamics, aiding in the refinement of meteorological models and their outputs, particularly in urban and rural settings
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	Anetta Drzeniecka-Osiadacz (anetta.drzeniecka-osiadacz@uwr.edu.pl) Tymoteusz Sawiński (Tymoteusz.sawinski@uwr.edu.pl)

SERVICE 3 – Instrument Testing and Intercomparison Campaigns	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Intercomparison campaigns. Comparison, testing, exploitation of any measurement devices with WOPAS instruments that follow ACTRIS protocols (both in-situ and remote-sensing aerosols measurements) or meteorological equipment. Campaigns can include the testing of usefulness for mobile measurements. These campaigns help users ensure compliance with measuring standards, improve device calibration, and build capacity through hands-on experience.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, 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	Anetta Drzeniecka-Osiadacz (anetta.drzeniecka-osiadacz@uwr.edu.pl) Tymoteusz Sawiński (Tymoteusz.sawinski@uwr.edu.pl)
SERVICE 4 – Allergic pollen measurements	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	Measurement campaigns aim to analyze the variability of plant pollen in the urban atmosphere and its coexistence with air pollutants to determine potential adverse health effects. The planned measurements will include in-situ observations (using the Swissens Poleno Jupiter automatic pollen analyzer and the Burkard-type manual pollen trap) as well as lidar measurements utilizing the fluorescence channel.
ATMOSPHERE TYPE	ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia,
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Pollen season
TIME CONSTRAINTS	None
CONTACT	Anetta Drzeniecka-Osiadacz (anetta.drzeniecka-osiadacz@uwr.edu.pl) Małgorzata Werner malgorzata.werner@uwr.edu.pl
SERVICE 5 – Mobile measurements of air quality and meteorological and biometeorological parameters	
TYPE OF SERVICE	Research service, technical service, innovation service

SERVICE DESCRIPTION	An important supplement to stationary measurements can be mobile measurements of atmospheric environment parameters (e.g. air pollution, meteorological and biometeorological parameters, etc.). Such measurements can be performed using drones, car platforms, bicycles and other similar vehicles, as well as on foot. The experience of the team of the WOPAS indicates that the results of such measurements can be used, among others, for recognition of spatial variability of measured parameters on a local and micro scale, recognition of variability of measured parameters outside the area covered by stationary measurements, indication of areas particularly exposed to hazards related to the atmospheric environment. Within these services, the WOPAS team offers both urban oriented measurements and measurements in mountain areas. Moreover during campaigns the usefulness of sensors can be tested. Mobile measurements provide unique insights into spatial and temporal variability of atmospheric parameters, identifying hotspots and supporting tailored mitigation strategies in both urban and challenging mountainous environments.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, 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	Anetta Drzeniecka-Osiadacz (anetta.drzeniecka-osiadacz@uwr.edu.pl) Tymoteusz Sawiński (Tymoteusz.sawinski@uwr.edu.pl

3.18 Services provided by WOS - Warsaw Observatory Station

SERVICE A – Access to facility for tailored experiments and integration of data using different active, passive and in-situ stationary and mobile instruments at WOS	
LOCATION	Poland, Mazovia, Warsaw
TYPE OF SERVICE	Research/Technical service
SERVICE DESCRIPTION	The service is related to access to WOS facilities for dedicated experiments tailored to the needs of users, including integration of data provided by different ACTRIS active, passive and in-situ instruments operating at WOS. The access includes the possibility to carry out integrated studies with the user instrumentation. Specific measurements campaigns can be planned based on user request.

	WOS facility comprises 3 labs: Remote Sensing Laboratory, Radiation Transfer Laboratory, and Fluid Dynamics Laboratory. The user can get access to all of them, depending on the needs. WOS geographic position, in East-Central Europe in a flatland urban environment makes the observatory a perfect location for investigating different aerosol types and atmospheric processes and setting up experiments with the support of the researchers and technicians operating WOS.
ATMOSPHERE TYPE	Ambient, Modified
TYPE OF ACCESS	Physical, remote, hybrid
TARGET USERS	Academia, Public sector, Private sector
SERVICE STATUS	The service is available (operational and ready to be offered). Among others, the following instruments are available at WOS: stationary multi-wavelength near- and far-field Raman lidar with polarization and water vapor capability, mobile multiwavelength Raman lidar with fluorescence capability, stationary photometer, Doppler lidar, microwave radiometer, disdrometer, shadowgraph, gas spectrometers, pollen monitor, different microscopes, aethalometer, ambient nephelometer, nephelometer with humidity chamber, compact cloud chamber, aerodynamic tunnel, integrating half-sphere FTIR, wide range of radiation sensors, set of meteorological sensors, radio-sounding system
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	The remote and physical access of the external users at the WOS facility must be discussed and planned with the PI of WOS and the TNA coordinators. External users are allowed to access WOS observatory only under WOS personnel supervision, prior to their registration in the Visitor System. The user must go via HPS training prior to accessing the WOS facility.
CONTACT	PI of WOS Facility: Iwona Stachlewska iwona.stachlewska@fuw.edu.pl TNA Physical Access coordinator: Lucja Janicka lucja.janicka@fuw.edu.pl TNA Remote Access coordinator: Dominika Szczepanik dominika.szczepanik@fuw.edu.pl
SERVICE B – Access to facility for new technologies/instrumentation testing and optimization	
LOCATION	Poland, Mazovia, Warsaw
TYPE OF SERVICE	Technical service, research and development service
SERVICE DESCRIPTION	The service is related to access to WOS facilities for tailored testing of new technologies and/or instrumentation provided by the users depending on their needs and requests. The service comprises optoelectronic engineering and expert knowledge on building instruments for data collection and signal analysis. WOS offers the co-development of instruments and gives the possibility of multifaced testing and tailored application of novel technologies.

	WOS tenders access for users to the well-equipped laboratories, giving the possibility of measurement conduction and/or instrumentation testing in a pre-defined, well-controlled atmosphere (e.g. air conditioning, additional heating, possibility of opening the roof for remote sensing applications). WOS facility comprises 3 labs: Remote Sensing Laboratory, Radiation Transfer Laboratory, and Fluid Dynamics Laboratory. The user can get access to all of them, depending on their needs. The access includes the possibility to mount new devices to existing instrumentation to test and assess its capabilities and added value it provides. Expert knowledge provided by the WOS team aims at enhancing the user's instrumentation/technologies and thorough fully testing/optimizing technological processes thanks to intensive experiments done for the user (in his/her presence or not). This includes comparison device-to-device and data-to-data with instruments of WOS during simultaneous collocated measurements. Thus, new applications of tested technology might be found/proposed. Realization of the access includes technical and engineering assessment of WOS staff as well as expertise of experienced scientists to analyse obtained results. WOS is offering a comparison of newly captured data with existing measurements provided by different ACTRIS active and passive instruments available onsite, which are ESA MObile RAman Lidar (EMORAL), Aerosol Depolarization Raman PollyXT lidar (ADR PollyXT), Near-range Raman Lidar (NARLa), sunphotometer CIMEL, Pandora S2. The service includes technical support with the measurement device installation as well as advice on the issue of transportation of measuring equipment. Thanks to experience in previous work with the private sector WOS staff is aware of confidentiality agreements, thus able to avoid conflict of interests, and it is open to signing respective agreements.
ATMOSPHERE TYPE	Ambient, Modified
TYPE OF ACCESS	Physical, remote or hybrid
TARGET USERS	Private sector, R&D sector, Industrial sector
SERVICE STATUS	The service is available (operational and ready to be offered).
AVAILABILITY PERIOD	All year
TIME CONSTRAINTS	The remote and physical access of the external users at the WOS facility must be discussed and planned with the PI of WOS and the TNA coordinators. External users are allowed to access WOS observatory only under WOS personnel supervision, prior to their registration in the Visitor System. The user must go via HPS training prior to accessing the WOS facility.
CONTACT	PI of WOS Facility: Iwona Stachlewska iwona.stachlewska@fuw.edu.pl TNA Physical Access coordinator: Lucja Janicka lucja.janicka@fuw.edu.pl TNA Remote Access coordinator: Dominika Szczepanik dominika.szczepanik@fuw.edu.pl
SERVICE C – Access to facility for aerosol typing and long-range transport assessment	

LOCATION	Poland, Mazovia, Warsaw
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	This service consists of conducting experiments and performing comprehensive analysis of both optical and microphysical aerosol properties, provided by manual or automated data analysis with the use of certified ACTRIS tools, and tools developed at WOS Facility assuring the highest levels of data products. The WOS facility offers expert knowledge on the atmospheric aerosol optical properties of different aerosol types (e.g. biomass burning aerosol, mineral dust), especially transported over long distances. We offer to perform experiments and analyses with a use of a wide range of measurement techniques and data analysis approaches. For interpretation of the obtained results WOS facility team applies different transport models (HYSPLIT, FLEXPART) and aerosol prediction models (NAAPS, Barcelona Dust Forecast Center), as well as the MODIS imagining to spot the wildfires. WOS facility researchers/technicians have deep, documented with the research projects, experience in biomass burning aerosol studies including analysis of the fresh and aged BBA in the fine temporal and spatial resolution as well as their impact on the Earth radiative transfer. The interface PROfiler developed at WOS allows for efficient and insightful comparative studies of the aerosol layers. The microphysical parameters in BBA layers are being successfully retrieved with the mathematical inversion methods. The remote sensing of the BBA at WOS is supported by in-situ measurements of black carbon and photometer/spectrometer measurements in column of the atmosphere. In case of mineral dust retrievals we offer additional data products such as the mineral dust separation including the apportionment of fine and coarse mode of aerosol (POLIPHON). For distinguishing between agricultural dust and pollen contribution in the boundary layer in-situ pollen detection is being applied. Thanks to inversion of lidar/photometer data WOS can provide the particle size distribution of mineral dust particles. Expertise and algorithms for aerosol cloud interactions might be provided thanks to the synergy of different aerosol and cloud remote sensing instrumentation.
ATMOSPHERE TYPE	Ambient, Modified
TYPE OF ACCESS	Physical, remote or hybrid
TARGET USERS	Academia, AQMN, International organizations, Local/Regional administration Private sector
SERVICE STATUS	The service is available (operational and ready to be offered).
AVAILABILITY PERIOD	All year
TIME CONSTRAINTS	The remote and physical access of the external users at the WOS facility must be discussed and planned with the PI of WOS and the TNA coordinators. External users are allowed to access WOS observatory only under WOS personnel supervision, prior to their registration in the Visitor System. The user must go via HPS training prior to accessing the WOS facility.
CONTACT	PI of WOS Facility: Iwona Stachlewska iwona.stachlewska@fuw.edu.pl TNA Physical Access coordinator: Lucja Janicka lucja.janicka@fuw.edu.pl

	TNA Remote Access coordinator: Dominika Szczepanik dominika.szczepanik@fuw.edu.pl
SERVICE D – Access to services for urban boundary layer research	
LOCATION	Poland, Mazovia, Warsaw
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The WOS facility offers access to services for provision of comprehensive information and studies necessary for the description of the urban boundary layer. It includes both multifaced analysis of measurements taken (Doppler lidar, Near-Range Raman Lidar, Aerosol Depolarization Lidar, Microwave radiometer, weather station, Pollen sampler, Aethalometer, and Nephelometer) and small-scale meteorological and air-quality modeling (PALM). Additionally, we offer the use of in-house developed tools for retrieval of boundary layer properties based on the synergy of instruments (LIRAMI). Our approach allows for adjusting measurements and the codes to the needs of the user. For the boundary layer studies the WOS facility offers an access to Remote Sensing Laboratory and Radiation Transfer Laboratory. The user can get access to both of them, depending on the needs. WOS facility location in a flatland urban environment, in close vicinity to the strict city center of Warsaw makes the observatory a perfect location for investigating urban boundary layer behavior and dynamics during different seasons. It also enables the possibility of assessing the urban heat island effect, as well as study of diurnal patterns of air pollution concentration including its vertical transport or fog/smog conditions. In Warsaw, there are available stations of state air quality monitoring agency – CIEP that can be considered representative for WOS facility surroundings and vice versa. Thus services to AQMN can be also targeted.
ATMOSPHERE TYPE	Ambient, Modified
TYPE OF ACCESS	Physical, remote, hybrid
TARGET USERS	Academia, Public sector, Private sector
SERVICE STATUS	The service is available (operational and ready to be offered). Among others, the following instruments are available at WOS: stationary multi-wavelength near- and far-field Raman lidar with polarization and water vapor capability, mobile multiwavelength Raman lidar with fluorescence capability, stationary photometer, Doppler lidar, microwave radiometer, disdrometer, shadowgraph, gas spectrometers, pollen monitor, different microscopes, aethalometer, ambient nephelometer, nephelometer with humidity chamber, compact cloud chamber, aerodynamic tunnel, integrating half-sphere FTIR, wide range of radiation sensors, set of meteorological sensors, radio-sounding system
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	The remote and physical access of the external users at the WOS facility must be discussed and planned with the PI of WOS and the TNA coordinators. External users are allowed to access WOS observatory only under WOS personnel supervision, prior to their registration in the Visitor System. The user must go via HPS training prior to accessing the WOS facility.

CONTACT	PI of WOS Facility: Iwona Stachlewska iwona.stachlewska@fuw.edu.pl TNA Physical Access coordinator: Lucja Janicka lucja.janicka@fuw.edu.pl TNA Remote Access coordinator: Dominika Szczepanik dominika.szczepanik@fuw.edu.pl
SERVICE E– Access to services for tailored experiment	
LOCATION	Poland, Mazovia, Warsaw
TYPE OF SERVICE	Research/Technica/Monitoring services
SERVICE DESCRIPTION	The service is related to access to WOS facilities for dedicated experiments tailored to the needs of users, with the possibility of use of the instrumentation existing onsite and/or provided by the user. The service offers assistance and expertise to the WOS researchers at the stage of planning campaign details, taking measurements, data collection, and evaluation. Experienced scientists employed at the WOS are experts in various fields thus able to provide the analyses, expertise, and skills in the area of atmospheric aerosol properties, lidar measurements, aerosol microphysics retrieval from the lidar profiles, radiative transfer, and cloud and turbulence modeling. Users of the WOS facility can get access to the internal algorithms developed on-site, among others the LIRAMI, LILI, EMERALD and PROfiler, to enhance their analysis. WOS facility comprises 3 labs: Remote Sensing Laboratory, Radiation Transfer Laboratory, and Fluid Dynamics Laboratory. The user can get access to all of them, depending on the needs. From the technical point of view, the service offers support with the measurement device installation as well as advice on the issue of transportation of measuring equipment. The WOS facility has dedicated laboratories for atmospheric physics measurements and measuring instrument calibration with a good connection (stairs / sliding roof-window) to the observational platform on the roof of the building. WOS facility geographic position, in East-Central Europe in a flatland urban environment makes the observatory a perfect location for investigating different aerosol types, atmospheric processes, and setting up experiments with the support of the researchers and technicians operating WOS.
ATMOSPHERE TYPE	Ambient, modified
TYPE OF ACCESS	Physical, remote, hybrid
TARGET USERS	Academia, Public sector, Private sector
SERVICE STATUS	The service is available (operational and ready to be offered). Among others, the following instruments are available at WOS: stationary multi-wavelength near- and far-field Raman lidar with polarization and water vapor capability, mobile multiwavelength Raman lidar with fluorescence capability, stationary photometer, Doppler lidar, microwave radiometer, disdrometer, shadowgraph, gas spectrometers, pollen monitor, different microscopes, aethalometer, ambient nephelometer, nephelometer with humidity chamber, compact cloud chamber, aerodynamic tunnel, integrating half-sphere FTIR, wide range of radiation sensors, set of meteorological sensors, radio-sounding system.

AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	The remote and physical access of the external users at the WOS facility must be discussed and planned with the PI of WOS and the TNA coordinators. External users are allowed to access WOS observatory only under WOS personnel supervision, prior to their registration in the Visitor System. The user must go via HPS training prior to accessing the WOS facility.
CONTACT	PI of WOS Facility: Iwona Stachlewska iwona.stachlewska@fuw.edu.pl TNA Physical Access coordinator: Lucja Janicka lucja.janicka@fuw.edu.pl TNA Remote Access coordinator: Dominika Szczepanik dominika.szczepanik@fuw.edu.pl

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) instrumentation, 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, 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	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, 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	Dennis Niedermeier (niederm@tropos.de) Frank Stratmann (stratman@tropos.de)

4.2 Services provided by AIDA – Atmospheric Simulation Chamber

SERVICE 1 – Exploration of aerosol-cloud-climate processes at the AIDA chamber	
TYPE OF SERVICE	Research service

SERVICE DESCRIPTION	This service for collaborative experiment series with a duration of up to 3 or 4 weeks on investigating aerosol-cloud-climate processes includes: - experiment planning, - administrative and technical support for installing and operating user instruments at the facility, - technical and scientific support in operating the facility and its standard instrumentation needed for the experiments, - training on facility operation procedures, facility instruments and scientific background, - data provision - support on analyzing and evaluating the chamber-specific data.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical and/or remote access
TARGET USERS	Academia, private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, except August and December
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	Ottmar Möhler (ottmar.moehler@kit.edu)

SERVICE 2 – Testing of (new) instrumentation, and instrument intercomparisons under well controlled atmospheric conditions in the AIDA cloud simulation chamber	
TYPE OF SERVICE	Technical and innovation service
SERVICE DESCRIPTION	The AIDA facility provides the possibility of testing (new) sampling instruments for water vapor, aerosols, ice-nucleating particles, cloud droplets and ice crystals, including those used for field measurements or on research aircrafts, and to perform instrument intercomparisons under well-defined and controlled laboratory conditions.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access
TARGET USERS	Academia, private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round, except August and December
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory
CONTACT	Ottmar Möhler (ottmar.moehler@kit.edu)

4.3 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. Generation of seed aerosols formed from bursting bubbles in a sea spray simulation chamber (AEGOR), generated either via aeration through a diffuser or via a plunging jet. AEGOR can be connected to the AURA Chamber and aerosols can be transferred to AURA chamber for further processing. Can be operated with real or artificial seawater. 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 and instrumentation: https://chem.au.dk/en/research/research-areas-and-groups/physicalchemistry/apc/equipment https://chem.au.dk/en/research/research-areas-and-research-groups/analyticalchemistry/ac3/equipment/ See also: https://chem.au.dk/forskning/forskningscentre-og-projekter/c3
ATMOSPHERE TYPE	Controlled atmosphere, ambient pressure
TYPE OF ACCESS	Physical or a combination of physical and remote
TARGET USERS	Mainly academia (collaborative projects), potentially 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 technical support), madsmj@chem.au.dk Emil Mark Iversen (facility technical support), emilmi@chem.au.dk

4.4 Services provided by CESAM platform (including CESAM and CSA chambers) - Chambers for Multiphase Atmospheric Processes Research

SERVICE 1 - Scientific research on tropospheric multiphase processes under controlled chamber conditions	
TYPE OF SERVICE	Research service, innovation service

SERVICE DESCRIPTION	CESAM chamber is a unique research infrastructure to investigate multiphase atmospheric processes including SOA formation, aerosol aging, cloud chemistry, etc. It is a 4.2 m3 stainless steel reactor, evacuable and temperature controlled (0°C to 60°C). It is equipped with a highly realistic irradiation system and with a comprehensive set of analytical instruments, including PTR-MS, AMS, CIMS, in situ long path UV-vis and FTIR, etc. Features that make this platform particularly suited to investigate multiphase processes are: - very long submicronic aerosol lifetime - ability to produce clouds - protocol for mineral dust seeding - high cleanliness level - quality of the instrumentation
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Academia, Private and Public sectors
SERVICE STATUS	Fully operational
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Bénédicte Picquet-Varrault (benedicte.picquet-varrault@lisa.ipsl.fr) Mathieu Cazaunau (mathieu.cazaunau@lisa.ipsl.fr)

SERVICE 2 - Investigation of kinetics and mechanisms of gas-phase reactions	
TYPE OF SERVICE	Research service, innovation service
SERVICE DESCRIPTION	The CSA chamber is one of the two chambers of the CESAM platform. It is dedicated to the gas-phase atmospheric chemistry and spectroscopy studies. It is a 1m3 pyrex reactor evacuable and is operated at room temperature. It is equipped with a highly realistic artificial irradiation system and with analytical techniques including in situ long path UV-Visible and FTIR, in situ IBB-CEAS (for NO3 measurement) and PTR-Tof-MS. The CSA chamber is particularly suited for intercalibration of IR/UV spectra and study of kinetics and mechanisms of gas phase reactions.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Academia, Private and Public sectors
SERVICE STATUS	Fully operational
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None

CONTACT	Bénédicte Picquet-Varrault (benedicte.picquet-varrault@lisa.ipsl.fr) Mathieu Cazaunau (mathieu.cazaunau@lisa.ipsl.fr)

SERVICE 3 - Newly developed instrumentation testing, (inter)calibrations and intercomparisons	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	CESAM platform 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, remote
TARGET USERS	Academia, Private and Public sectors
SERVICE STATUS	Fully operational
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Bénédicte Picquet-Varrault (benedicte.picquet-varrault@lisa.ipsl.fr) Mathieu Cazaunau (mathieu.cazaunau@lisa.ipsl.fr)

SERVICE 4 - Scientific research on aerosol optical properties	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	CESAM chamber is a powerful infrastructure to investigate aerosol optical properties. It is equipped with in situ long path spectrometers to measure the aerosol extinction from UV-vis to mid-IR spectral ranges, and with various on-line techniques including nephelometer, aethalometer (7 wavelengths), CRDS. Different injection systems allow the introduction/generation of organic aerosol, soot, dust and salt.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, remote
TARGET USERS	Academia, Private and Public sectors
SERVICE STATUS	Fully operational
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Bénédicte Picquet-Varrault (benedicte.picquet-varrault@lisa.ipsl.fr) Mathieu Cazaunau (mathieu.cazaunau@lisa.ipsl.fr)

SERVICE 5 - Scientific research on health impact of air pollution through exposition of living organisms	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	CESAM chamber can be combined with the POLLURISK platform to expose living organisms to atmospheric pollutants (controlled mixtures). The key features of CESAM-POLLURISK are: - Exposure of preclinical models to urban atmospheric pollution - Biological facility to conduct analysis on preclinical models (as an illustration lung function, systemic response, biological analyses, blood/urine/organs sampling, … - Exposure of preclinical models to more complex exposome as noise and stress - Measurement of associated Oxidative Potential of the simulated exposome - Exposure of cells/organoids in parallel to in vivo studies (starting 2025): in a nutshell, in vivo studies are dedicated to establish the links between Exposome components and Health Effects, when in vitro studies will contribute to identify the nature of these links.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical
TARGET USERS	Academia, Private and Public sectors
SERVICE STATUS	Fully operational
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Bénédicte Picquet-Varrault (benedicte.picquet-varrault@lisa.ipsl.fr) Mathieu Cazaunau (mathieu.cazaunau@lisa.ipsl.fr)

4.5 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, 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	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 algorithms, 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, 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	Paolo Prati (prati@ge.infn.it), Dario Massabò (massabo@ge.infn.it), Federico Mazzei (federico.mazzei@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, Aurora 4000 nephelometer, 7-wavelength CASS system; sampling on filters/impactors and off-line analyses by Multi Wavelength Absorbance Analyzer (MWAA), Broadband Light Analyzer of Complex Aerosol (BLAnCA) 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), Dario Massabò (massabo@ge.infn.it), Federico Mazzei (federico.mazzei@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, 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	Paolo Prati (prati@ge.infn.it), Dario Massabò (massabo@ge.infn.it), Federico Mazzei (federico.mazzei@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-purpose facility connected to a laboratory fully equipped for aerosol sampling and characterization. Nature Based Solutions (NBS) tests. 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, 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	Paolo Prati (prati@ge.infn.it), Dario Massabò (massabo@ge.infn.it), Federico Mazzei (federico.mazzei@ge.infn.it)
SERVICE 6 – Production, ageing and characterization of atmospheric aerosols	
TYPE OF SERVICE	Research service, technical service, innovation service
SERVICE DESCRIPTION	Production , injection , ageing , collection and characterization of atmospheric aerosols. Particulate matter analysis through off-line gravimetric, optical and thermo-optical analysis, Energy Dispersive- X Ray Fluorescence, Ion Chromatography 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, 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	Paolo Prati (prati@ge.infn.it), Dario Massabò (massabo@ge.infn.it), Federico Mazzei (federico.mazzei@ge.infn.it)

4.6 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.
	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Academia, Private sector, 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
	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Academia, Private sector, 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.
	Controlled atmosphere
TYPE OF ACCESS	Physical (preferred) and remote access
TARGET USERS	Private sector, 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)

4.7 Services provided by IASC – Irish Atmospheric Chemistry Simulation Chamber

SERVICE 1 – Experimental investigations of atmospheric processes	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The service consists of: - Physical access to the IASC facility - possibility to perform 6 hr 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 IASC - Training on how to design and perform chamber experiments by experienced scientists - Remote access to the IASC facility and provision of data from simulation chamber experiments. IASC is a custom-built atmospheric simulation chamber specially designed for investigating atmospheric processes, as well as testing and developing new atmospheric measurement techniques. The chamber is a 27 m3 cuboid (4.5 m long × 3 m wide × 2 m high) made of FEP Teflon foil, supported in a frame and surrounded by an air-conditioned housing. Several banks of lamps provide UV-A and UV-B radiation to enable studies of atmospheric photochemistry. The chamber is fitted with a gas flow control system for filling/flushing the chamber

	with purified dry air and numerous ports for adding/sampling gases and particles. A specially designed access door also allows items (e.g. sensors or devices, samples or test materials) to be positioned inside the chamber. The facility is equipped with a comprehensive range of instruments: - Highly sensitive time of flight chemical ionisation mass spectrometer (ToF-CIMS, Aerodyne) for monitoring volatile organic compounds (VOCs) and other gases at atmospherically relevant concentrations. The instrument is also equipped with a Filter Inlet for Gases and AEROsols (FIGAERO) to allow collection and analysis of species in the particulate phase. - Unique custom-built spectroscopy system for in situ measurements of gases, radicals and properties of particles. Current capabilities are based on cavity enhanced spectroscopies and include HONO, NO2, glyoxal and NO3 radicals, as well as total extinction in the near UV. The system is customisable and can be adapted to measure a range of species over different parts of the spectrum. - Continuous online measurements of gases (CO2, NOx, O3, SO2) and particles (scanning mobility particle sizer). Air pressure, temperature, and relative humidity are also routinely recorded.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Mainly academia, but also private sector /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	John Wenger (j.wenger@ucc.ie), Andy Ruth (a.ruth@ucc.ie)
SERVICE 2 – Testing and development of new atmospheric measurement techniques	
TYPE OF SERVICE	Research and Innovation service
SERVICE DESCRIPTION	IASC will work with researchers and innovators to develop and test new techniques for measuring atmospheric gases and particles. Existing standard operating procedures can be used for comparing the performance of new techniques with established techniques.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical and remote
TARGET USERS	Academic researchers, companies and SMEs in the private sector, innovators in the public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	John Wenger (j.wenger@ucc.ie), Andy Ruth (a.ruth@ucc.ie)

SERVICE 3 – Performance testing of sensors and instruments	
TYPE OF SERVICE	Technical Service
SERVICE DESCRIPTION	IASC will work with innovators in both the public and private sector to test the performance of near-to-market sensors and instruments for measuring atmospheric gases and particles. Existing standard operating procedures can be used for comparing the performance of new products with established measurement methods.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical and remote
TARGET USERS	Companies and SMEs in the private sector, innovators in the public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	John Wenger (j.wenger@ucc.ie), Andy Ruth (a.ruth@ucc.ie)

4.8 Services provided by KASC – Kuopio Atmospheric Simulation Chambers

SERVICE 1 – Scientific atmospheric simulation chamber investigations with various emission sources	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The service consists of: - Investigations of atmospheric processes in the gas- and particle phase - Investigations of emissions from different combustion emission sources - Investigations of atmospheric aging od emissions from different combustion emission sources - Investigations on toxicological properties of aged and fresh emissions - Provision of data from experiments - technical service to use own instruments - training for planning, evaluation and interpretation of experiments - Testing and validating instruments
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Mainly academia, but also private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Year around
TIME CONSTRAINTS	None, although access has to be coordinated with other activities in laboratory

CONTACT	Annele Virtanen (annele.virtanen@uef.fi)

4.9 Services provided by MAC – Manchester Aerosol Chamber

SERVICE 1 – Scientific exploration at the MAC atmospheric simulation chamber	
TYPE OF SERVICE	Research service
SERVICE DESCRIPTION	The service consists of: - Physical, remote and hybrid access to the MAC facility - possibility to perform 6 -8 hr experiments in the simulation chamber - technical service to use own instruments - training for planning, evaluation and interpretation of experiments. - training with state of the art instrumentation connected to MAC - training in design and performance of chamber experiments by experienced scientists MAC is a custom-built atmospheric simulation chamber designed for investigating atmospheric processes, testing new atmospheric measurement techniques and investigating the potential climate and health impacts of pollutants. The chamber is a 18 m3 collapsible cuboid (3 m long × 2 m wide × 3 m high) made of FEP Teflon foil, supported by a central fixed frame and counter-weighted upper and lower frames, surrounded by an air-conditioned housing. A suite of arc, halogen and uv mercury lamps provides simulated solar irradiation. A gas flow control system provides automated filling and flushing of the chamber with purified dry air and numerous ports allow addition and sampling of gases and particles, with bespoke manifolds allowing ready adaptation of instrument and device connection. The facility has a wide range of ancillary components for injection of pollutants, including electropneumatically valve-controlled large-bore inlets for real pollutant sources (wood-burning stove, Euro 6 engine dynamometer, cooking chamber etc…). The chamber can be connected to a variety of devices for investigation of health impacts, including cell exposures (using an air-liquid interface system) and human exposures under clinical trial conditions. The facility is equipped with a comprehensive range of instruments including: i) number of single- and multi-reagent ion time of flight chemical ionisation mass spectrometer (ToF-CIMS, Aerodyne) for monitoring volatile organic compounds (VOCs) and other gases at atmospherically relevant concentrations with a range of inlets including the Filter Inlet for Gases and AEROsols (FIGAERO) to allow analysis of particulate species. ii) wide range of particle analysis instrumentation, including mobility, optical and aerodynamic sizing (SMPS, DMPS, OPC, APS) and online composition analysis by various time of flight aerosol mass spectrometers (C-ToF, HR-ToF and L-ToF AMS instruments) and particle water uptake under sub-saturated and supersaturated conditions (HTDMA and CCNc) iii) Continuous online measurements of gases (CO2, NOx, O3), pressure, temperature, and relative humidity by capacitance and dewpoint hygrometers.

ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, hybrid and remote access are all possible
TARGET USERS	Mainly academia, but also private sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	Year round.
TIME CONSTRAINTS	None, although access, staff, ancillary component and instrument availability must be coordinated with other activities in laboratory
CONTACT	Gordon McFiggans (g.mcfiggans@manchester.ac.uk)
SERVICE 2 – Intercomparison and performance assessment of instrumentation at the MAC atmospheric simulation chamber	
TYPE OF SERVICE	Research, Technological service, Innovative service
SERVICE DESCRIPTION	MAC personnel will work with researchers and innovators to develop and test new techniques and instrumentation for measuring atmospheric gases and particles. Existing standard operating procedures can be used for comparing the performance of new techniques with established techniques.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical, hybrid and remote
TARGET USERS	Academic researchers, companies and SMEs in the private sector, innovators in the public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Gordon McFiggans (g.mcfiggans@manchester.ac.uk)

SERVICE 3 – Technical and innovation services at the MAC atmospheric simulation chamber	
TYPE OF SERVICE	Technological service, Innovative service
SERVICE DESCRIPTION	MAC will work with innovators in both the public and private sector to test the performance of: i) products influenced by atmospheric composition and properties. Product performance reports can be prepared under controlled atmospheric conditions and ii) near-to-market sensors and instruments for measuring atmospheric gases and particles. Existing standard operating procedures can be used for comparing the performance of new products with established measurement methods.
ATMOSPHERE TYPE	Controlled atmosphere

TYPE OF ACCESS	Physical, hybrid and remote
TARGET USERS	Companies and SMEs in the private sector, innovators in the public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	All year round
TIME CONSTRAINTS	None
CONTACT	Gordon McFiggans (g.mcfiggans@manchester.ac.uk)

4.10 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)

4.11 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)

4.12 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	The service consists of: - Investigation of atmospheric processes in the gas- and particle phase - 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. - Testing and validating instruments.
ATMOSPHERE TYPE	Controlled atmosphere
TYPE OF ACCESS	Physical access is preferred, remote access can also be provided
TARGET USERS	Mainly academia, but also 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 AMP – ACTRIS Poland Mobile LAB

SERVICE 1 – Access to services of the ACTRIS-Poland Mobile LAB In situ measurements	
TYPE OF SERVICE	Research service, Technical service
SERVICE DESCRIPTION	AMP provides ground-based and airborne (hot-air balloon) atmospheric monitoring services, supporting scientific experiments and the testing of measurement devices, including: measuring particle sizes suspended in air within the 0.3–10 µm range; determining the concentration of collected particle fractions; measuring air temperature, pressure, and humidity; measuring ozone and soot concentrations; measuring the concentrations of atmospheric gasses such as CO_2, NO, NO_2, NH_3, SO_2, benzene, formaldehyde, and total volatile organic compounds (VOCs); collecting pollutant samples for chemical, biochemical, and crystallographic analyses in stationary laboratories; collecting and analyzing nanoparticles in the 10–300 nm range; and collecting and analyzing flora pollen, fungal spores, zooplankton, and microorganisms. AMP enables the examination of collected air pollutant samples, especially their morphology, chemical and phase composition, in order to determine their source. More information: https://us.edu.pl/en/nauka-i-badania/centra-badawcze/ulka/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote / Physical
TARGET USERS	Academia, private 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	Mariola Jabłońska (mariola.jablonska@us.edu.pl) Anna Abramowicz (anna.abramowicz@us.edu.pl)

SERVICE 2 - Access to services of the ACTRIS Poland Mobile Lab AMP remote sensing measurements	
TYPE OF SERVICE	Research service, Technical Service
SERVICE DESCRIPTION	AMP offers atmospheric measurements using a mobile scanning lidar equipped with channels at 355S, 355P, 387, and 408 nm. More information: https://us.edu.pl/en/nauka-i-badania/centra-badawcze/ulka/
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Remote / Physical
TARGET USERS	Academia, private 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	Mariola Jabłońska (mariola.jablonska@us.edu.pl) Anna Abramowicz (anna.abramowicz@us.edu.pl)

5.2 Services provided by FComLab – Finland Combined Mobile Laboratory

SERVICE 1 – Calibration and audit	
TYPE OF SERVICE	Technical service
SERVICE DESCRIPTION	Calibration and audit of an ICOS station with ICOS mobile laboratory.
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 the ICOS mobile laboratory.
TIME CONSTRAINTS	The service is available but must fit into the audit schedule of the ICOS mobile laboratory
CONTACT	Hermanni Aaltonen, hermanni.aaltonen@fmi.fi
SERVICE 2 – Deployment to user-defined location	
TYPE OF SERVICE	Research service

SERVICE DESCRIPTION	Deployment of the Atmo-Lab or CMLab to user-defined custom location. Requires coordination between user and service provider.
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 ATMO-Lab and CMLab.
AVAILABILITY PERIOD	The service is available but must fit into the deployment schedule of ATMO-Lab or CMLab
TIME CONSTRAINTS	Must fit into the deployment schedule of ATMO-Lab or CMLab Deployment duration of > 1 month Preparation and transport time must also be considered
CONTACT	ATMO-Lab: Miikka dal Maso, miikka.dalmaso@tuni.fi CMLab: Ewan O'Connor, ewan.oconnor@fmi.fi

5.3 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, private 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, private 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, private 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)

5.4 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

6 Detailed list of services provided by Central Laboratories

6.1 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, private 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, private 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, private 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)

6.2 Services provided by the PACC – Prague Aerosol Calibration Centre

SERVICE 1 – Calibration of CPC	
TYPE OF SERVICE	Research, Technical service, Training
SERVICE DESCRIPTION	Calibration and operational checks for CPCs. CPC calibration includes: ● the check of the main operational parameters (flows, temperatures, laser current, etc.), ● measurement of CPC counting efficiency (3-40 nm), ● check/adjustment of CPC cut-off diameter (10 nm for ACTRIS), ● measurement of CPC output linearity (1 000 - 50 000 #/ccm). Training of operators for correct set-up and operation and basic maintenance of the CPCs. PACC is a new unit of CAIS-ECAC, but the hosting laboratory at ICPF CAS has a long lasting history in these measurements and is fully harmonized with WCCAP (TROPOS, Leipzig, Germany).
ATMOSPHERE TYPE	Controlled
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, private 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	Jakub Ondracek (ondracek@icpf.cas.cz)
SERVICE 2 – Calibration of MPSS	
TYPE OF SERVICE	Research, Technical service, Training
SERVICE DESCRIPTION	Calibration and operational checks for MPSSs. MPSS calibration includes: ● the check of the main status parameters (flows, HV, etc.), ● check of the recommended set-up (bipolar charger, sensors - RH/T&p in aerosol and sheath flow, positive polarity HV supply, flow ratio, etc.), ● sizing check (NIST latex particles 203 nm), ● plumbing time check (up- and down-scan), ● check/adjustment of the sheath flow, ● comparison of the particle number size distribution against reference instruments (MPSS and total count CPC) on atmospheric aerosol. Training of operators for correct set-up and operation and basic maintenance of the MPSSs. PACC is a new unit of CAIS-ECAC, but the hosting laboratory at ICPF CAS has a long lasting history in these measurements and is fully harmonized with WCCAP (TROPOS, Leipzig, Germany).
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, private 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	Jakub Ondracek (ondracek@icpf.cas.cz)
SERVICE 3 – Estimation of size resolved particle losses in the parts of sampling line	
TYPE OF SERVICE	Research, Technical service
SERVICE DESCRIPTION	Estimation of size resolved losses (penetration efficiency) of any parts of the sampling line. The measurement set-up allows for: ● monodisperse testing aerosol (20-400 nm, salt solutions - usually ammonium sulphate, etc.), ● penetration estimation up to 99.99999%, ● built-in correction for the detector (CPC) inconsistency, ● automated and fully controlled measurement process.

	PACC is a new unit of CAIS-ECAC, but the hosting laboratory at ICPF CAS has a long lasting history in these measurements including testing of filtration efficiency of over 250 different types of PPE (Personal Protective Equipment) during COVID pandemic.
ATMOSPHERE TYPE	Controlled
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, private 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	Jakub Ondracek (ondracek@icpf.cas.cz)
SERVICE 4 – Technical audits of the microphysical measurements	
TYPE OF SERVICE	Research, Technical service, Training
SERVICE DESCRIPTION	Offer of technical audits for the measurements stations and measurements set-up Compliance with ACTRIS standards (based on CEN/TS/best practice/decades of experience): ● sampling inlets, ● sampling lines, ● aerosol conditioning (drying), ● correct operation (parameters) of microphysical instruments. Recommendations for improvements and possible arrangements in order to comply with standard operating procedures. PACC is a new unit of CAIS-ECAC, but the hosting laboratory at ICPF CAS has a long lasting history in aerosol measurements and in the last 3 years being also responsible for technical audits of ACTRIS AIS NFs.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical, Remote
TARGET USERS	Academia, private 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	Jakub Ondracek (ondracek@icpf.cas.cz)
SERVICE 5 – ACTRIS - CAIS-ECAC Aerosol In-Situ Course @NAOK	
TYPE OF SERVICE	Training school

SERVICE DESCRIPTION	The course is open to ACTRIS related people (NF technicians, Advanced master students, Ph.D. students and early career scientists) and also to external (non-ACTRIS) users. The course offers fundamental knowledge in aerosol sampling & conditioning as well as methods for aerosol in-situ measurements of physical and chemical aerosol variables (covering the whole variety of ACTRIS aerosol in-situ variables). The course includes a visit to the National Atmospheric Observatory Kosetice (NAOK) and hands-on training for some aerosol instruments. Detailed information can be found at: https://www.actris-ecac.eu/summer-school-2025.php The service includes: – accommodation at NAOK. – all meals. – transportation from Prague to NAOK and back.
ATMOSPHERE TYPE	Ambient, controlled
TYPE OF ACCESS	Physical
TARGET USERS	Academia, private sector and public sector
SERVICE STATUS	The service is available (operational and ready to be offered)
AVAILABILITY PERIOD	One weeks, once per year
TIME CONSTRAINTS	March-April
CONTACT	Jakub Ondracek (ondracek@icpf.cas.cz)

6.3 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, private and public 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

7 Training services developed in WP4

SERVICE – Young Scientists Training @AGORA	
TYPE OF SERVICE	Training school
SERVICE DESCRIPTION	Training through research of: a) fundamental knowledge in novel, advanced techniques for measuring aerosol properties, covering in situ, remote sensing, and laboratory-based instruments. This training is performed by physical access. b) hands-on training for some novel aerosol instruments. This training is performed by physical access. c) small research projects under the supervision of experienced researchers. This training is performed by hybrid access. More information at: https://atmosphere.ugr.es/informacion/presentacion/agora/training 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 and internet access, meeting rooms, kitchen and lunch room (physical). – Support for managing accommodation near UGR. – Scientific support for supervision and analysis of collected data (physical, remote).
ATMOSPHERE TYPE	Ambient, controlled
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	Three weeks, once per year
TIME CONSTRAINTS	Early summer
CONTACT	Lucas Alados-Arboledas (alados@ugr.es)

SERVICE – Hybrid workshop on sensors and drones @CiGAS-CH and CAO	
TYPE OF SERVICE	Training school

SERVICE DESCRIPTION	Training through research of: a) Common lectures on the use of sensors and drones and their combination for detection and surveillance of air pollutants and greenhouse gases. These are given in hybrid modes between Cyprus and Switzerland by mostly remote lecturers, who are leading in their field. b) hands-on training to analyse data from drones, related to air pollution and climate change. c) hands-on training to analyse data from in-situ sensors, elated to air pollution and climate change. More information at: https://www.atmo-access.eu/hybrid-autumn-schools/ The service includes: - Support in the analysis of air pollutants and greenhouse gases from drones and sensors, or a combination of both. - Administrative and technical support for providing a workspace for visitors: desk space and internet access, meeting rooms, kitchen and lunch room (physical). - Support for managing accommodation in Cyprus and Switzerland.
ATMOSPHERE TYPE	Ambient
TYPE OF ACCESS	Physical and Remote
TARGET USERS	Academia, young scientists, private sector
SERVICE STATUS	The workshop was held in November 2024
AVAILABILITY PERIOD	one week
TIME CONSTRAINTS	autumn 2024
CONTACT	Stefan Reimann (stefan.reimann@empa.ch); Jean Sciare (j.sciare@cyi.ac.cy)