The Cyprus Institute (CyI) is a non-profit research and educational institution with a strong scientific and technological orientation. It is an issue orientated institution, emphasizing international collaborations and cross-disciplinary research and post graduate education. CyI is being developed by establishing research centers to address important and challenging problems at both the regional and international levels. These research centers are developed in partnership with leading, world-class institutions in their respective thematic areas.

The mission of the Cyprus Atmospheric Observatory (CAO) at Agia Marina Xyliatou is to provide high quality, long-term observations of key atmospheric pollutants relevant to air quality and climate change. Located at a regional background site in Cyprus, the station is co-operated with the Department of Labour Inspection (DLI), which is in charge of the air quality network in Cyprus. The station is ideally located for documenting and contrasting long-range transported pollution from three continents (Europe, Africa, and West Asia), and dust aerosols from the two largest desert regions in the world (Sahara, Middle East). It offers on-site facilities and supportive infrastructure for research, development, and testing of technologies related to atmospheric measurements. It is equipped with state-of-the-art instrumentation jointly operated with research teams from CNRS in France, within the framework of the French Chemistry-Aerosol Mediterranean Experiment (ChArMEx) program.

Access to the station by the international scientific community is possible on a merit-based priority scheme, that is made possible via EU funding. This facility is an active component of major international atmospheric networks, and is supported by the Horizon 2020 ACTRIS2 project, which is the European Research Infrastructure for the observation of Aerosol, Clouds and Trace Gases, and is currently on the roadmap of the European Strategy Forum for Research Infrastructures (ESFRI). CAO has also been accepted as a regional station in the World Meteorological Organization (WMO) Global Atmosphere Watch (GAW) Programme, and is the first GAW regional station in Cyprus, and the first ever, in providing the most comprehensive set of quality controlled long-term atmospheric observations in the Eastern Mediterranean - Middle East (EMME) region.

For more information, please visit the website of the Cyprus Atmospheric Observatory, *www.cyi.ac.cy/index.php/cao.html*

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Printed July, 2017

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Cyprus Atmospheric Observatory

for Regional Air Pollution & Climate Change Observations at Agia Marina Xyliatou

Major Partners

Department of Labour Inspection (DLI, Cyprus)

Cyprus University of Technology (Cyprus)

Laboratoire des Sciences du Climat et de l'Environnement (CNRS, CEA, UVSQ, France)

Laboratoire d'Optique Atmosphérique (CNRS, Univ. Lille, France)

Max Planck Institute for Chemistry (Germany)

National Observatory of Athens (NOA, Greece)

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Research Projects & Networks

WMO-GAW: World Meteorological Organization - Global Atmospheric Watch

NASA-AERONET: National Aeronautics and Space Administration - Aerosol Robotic Network

EMEP: European Monitoring and Evaluation Programme

ACTRIS2 (H2020): European Research Infrastructure for the observation of Aerosol, Clouds, and Trace gases

ACTRIS PPP (H2020): Aerosols, Clouds, and Trace gases Research InfraStructure Preparatory Phase Project

BACCHUS (FP7): Impact of Biogenic versus Anthropogenic emissions on Clouds and Climate: towards a Holistic Understanding

MISTRALS/ChArMEx: Mediterranean Integrated Studies at Regional and Local Scales / The Chemistry-Aerosol Mediterranean Experiment

The Cyprus Atmospheric Observatory at Agia Marina Xyliatou

The Cyprus Atmospheric Observatory (CAO) collects real-time observations on essential aerosol characteristics (chemical composition, size distribution, multi-wavelength absorption and light scattering, wet/dry deposition), and radiative properties (aerosol optical depth, global/direct/diffuse radiation).

These measurements are quality controlled on a regular basis, via a harmonized, international inter-comparison framework, and are shared with the scientific community via worldwide data servers. The data is used to provide critical constraints on regional climate models addressing issues related to climate change and air pollution. The facility aims to:

- Provide quality controlled, long-term atmospheric observations on key atmospheric pollutants (gases/aerosols) related to climate change and air quality, observations not previously collected in the Eastern Mediterranean - Middle East (EMME) region.
- Provide efficient facilities to conduct field research studies, offer hands-on scientific and technical training in educational programs, and to test new sensors in atmospheric monitoring through a transnational access scheme.

The wet/dry deposition sampler

Aerial view of the facility

Research Activities at the Facility

Regional air quality baseline

The station's location enables observations not influenced by local contamination sources, and is therefore a strategic background site for the characterization of regional air pollution transported to Cyprus from Europe/Africa/W-Asia. Distinguishing air pollution that originates from the local Cypriot urban environment to that which arrives via transboundary, long-range transport, is critical for the evaluation and optimization of Cyprus' national mitigation measures.

Desert dust aerosols

Cyprus is located downwind of the two largest major deserts in the world (Sahara and Arabic Peninsula), N. Africa, and the Middle East. This Atlantic-Mediterranean source sector. To investigate pollution transport in four directions and its role in regional climate change, we have established a multi-platform infrastructure that combines the capabilities of the CAO with our UAV (Unmanned Aerial Vehicle) fleet, to additionally monitor the vertical structure of the atmosphere.

Inside view of the station

Crossroads of international air pollution transports

Cyprus is centrally located in the Eastern Mediterranean-Middle East (EMME), where a number of regional sources of air pollution can be monitored and compared. This includes Eastern Europe, the Black Sea, the Middle East and North Africa. Polluted air masses from these regions can be contrasted to clean air from the affords an opportunity to study the role of dust -air pollution interactions, since the atmospheric processing or "ageing" of dust particles is thought to change their chemical/physical/optical/hygroscopic growth properties, their lifetime (wet and dry deposition), their impact on clouds (cloud droplet and ice nucleating properties), and the radiative forcing of climate.