

A future centre for climate and weather research in the Eastern Mediterranean: the ATARRI project



Funded by the European Union

RSCy2025

GA No 101160258

R.E. Mamouri; A. Nisantzi; F. Scarlatti, E. Emili, A. Lopatin, L. Menard, R.A. Silva, S. Kazadzisa

PRESENTER: FRANCESCO SCARLATTI
ASSOCIATE RESEARCHER AT CLIMATE AND ENVIRONMENT
DEPARTMENT OF



francesco.scarlatti@eratosthenes.org.cy



OVERALL OBJECTIVES

The **overreaching objective** of the **ATARRI** Twinning activity is to **exploit the full potential of the ERATOSTHENES CoE Cyprus Atmospheric Remote Sensing Observatory (CARO) National Facility and Solar Network towards scientific excellence** and application development **in the atmospheric research** enhancing the Earth Observation R&I and modeling capacities of ERATOSTHENES Center of Excellence.

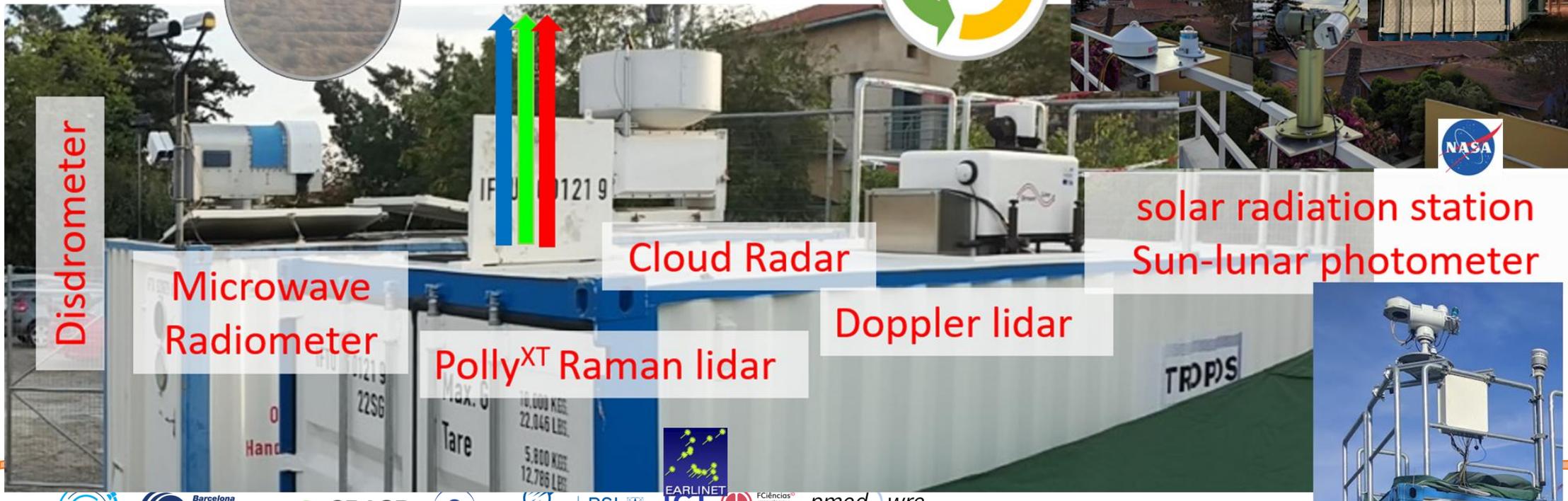
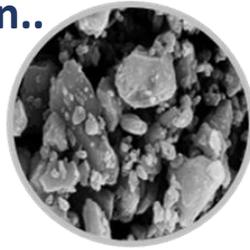




CARO-Cyprus Atmospheric Remote Sensing Observatory

Aerosol and Cloud Remote Sensing Observational Platforms

..presentation from Dr. Hossein Panahifar Rscy2025 Atmospheric section..



Disdrometer

Microwave Radiometer

Polly^{XT} Raman lidar

Cloud Radar

Doppler lidar

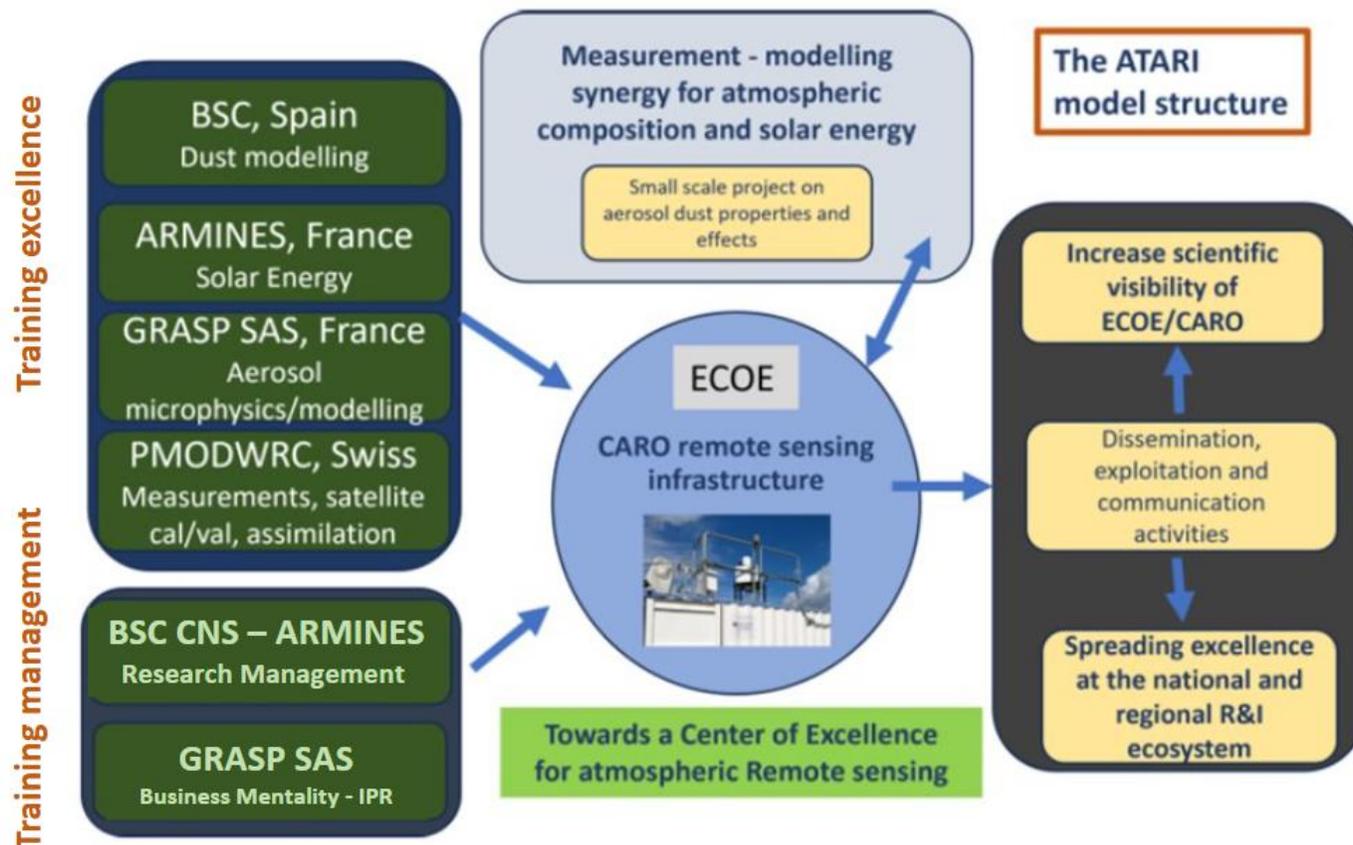
solar radiation station
Sun-lunar photometer





OBJECTIVES

- **The ERATOSTHENES CoE:** The ECoE was established on **February 2020** through the EXCELSIOR H2020 Widespread Teaming project (Grant Agreement No. 857510, www.excelsior2020.eu), **upgrading the existing Remote Sensing and Geo-Environment Lab** (www.cyprusremotesensing.com), which has been **operating at the Cyprus University of Technology (CUT) since 2007**.
- **The CARO NF:** The ECoE has **acquired during the last 3 years a number of high-quality atmospheric instrumentation for aerosols, clouds and solar radiation measurements**, in order to conduct research at the island of Cyprus. The atmospheric sector focused on the establishment of the Cyprus Atmospheric Remote Sensing Observatory (CARO) and the energy sector on the establishment of the solar radiation measuring network.
- **The GAP:** Although the monitoring capacity and the expertise on the EO, **major gaps of the ECoE group have to do with atmospheric modelling of aerosols and their interactions with solar radiation/energy**.
- **The opportunity:** **The high level of atmospheric observations collected by CARO can be integrated with atmospheric modelling to improve our understanding of various atmospheric processes**. Such synergies can be used to understand and **improve the uncertainties of atmospheric and climate model estimates**, as well as to study a variety of atmospheric processes and interactions.





PARTNERS

The **objective** of the project is supposed to be **achieved** through the collaboration **with research institutes** and its affiliated **universities**.



**Barcelona
Supercomputing
Center**

Centro Nacional de Supercomputación



PARTNERS DUTIES

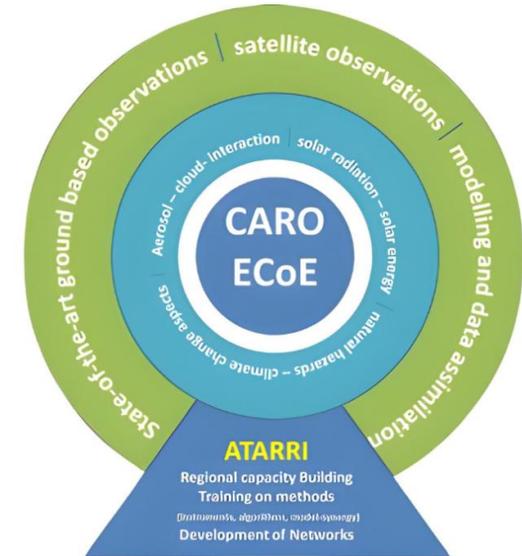
BSC/CNS: increasing dust modelling knowledge and capabilities.

GRASP SAS: develop synergistic products for enhanced atmospheric characterization (e.g. aerosols and clouds).

PMOD/WRC: enhancing ground-based aerosol remote sensing and solar measurement capabilities and satellite validation activities.

ARMINES/ENSMP: being capable of valorizing the acquired knowledge, competences, and data in urban photovoltaic (PV) solar energy applications.

FC.ID / CIENCIAS UL: Solar energy modelling at urban scales, Impact of strong dust intrusions on solar energy.





SCIENTIFIC DOMAINS

The **scientific domains** where the ATARRI **transfer of knowledge activities** will focus are of high interest for the region and are analyzed below:

- SSD1: Dust modelling and forecasting: [BSN/CNS]
- SSD2: Aerosol Microphysics characterization: [GRASP SAS]
- SSD3: Dust radiative effect and solar radiation [PMOD/WRC]
- SSD4: Solar energy applications [ARMINES/ENSMP and FC.ID/CIENCIAS ULIS]

THE CONCEPT

WP1 & 2: Coordination and Management



Coordination and Support Actions Training and Mobility actions

WP3 & 4: Enhance the scientific capacity of ECoE and CARO Team



WP5: Enhance the management and administration skills of ECoE and CARO Team



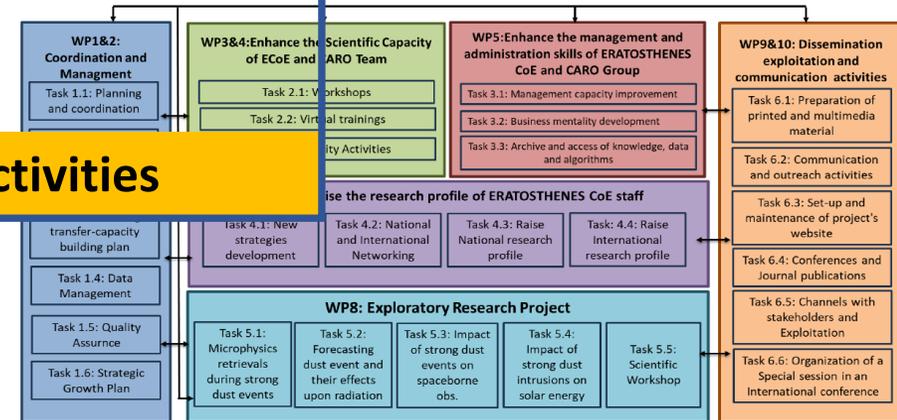
WP6&7: Raise the research profile of ECoE staff



WP8: Exploratory Research Project

Research actions

WP9 & 10: Dissemination, Exploitation and communication activities





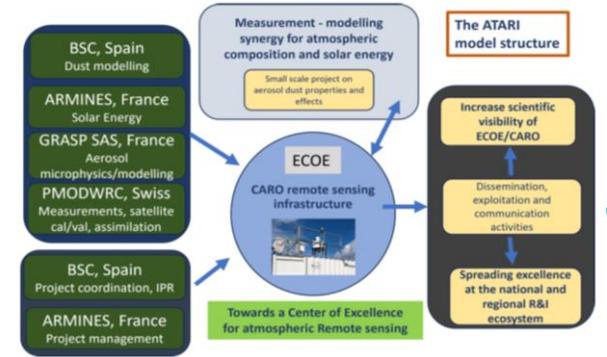
THE CONCEPT

3 Scientific and Technological Objectives (S&T):

STO.01: **Strengthen the expertise and improve the research profile of ECoE**, through strategic collaborations with highly capable and renowned partners in the field of atmospheric modelling and satellite calibration/ validation (cal/val) through modelling and remote sensing synergies.

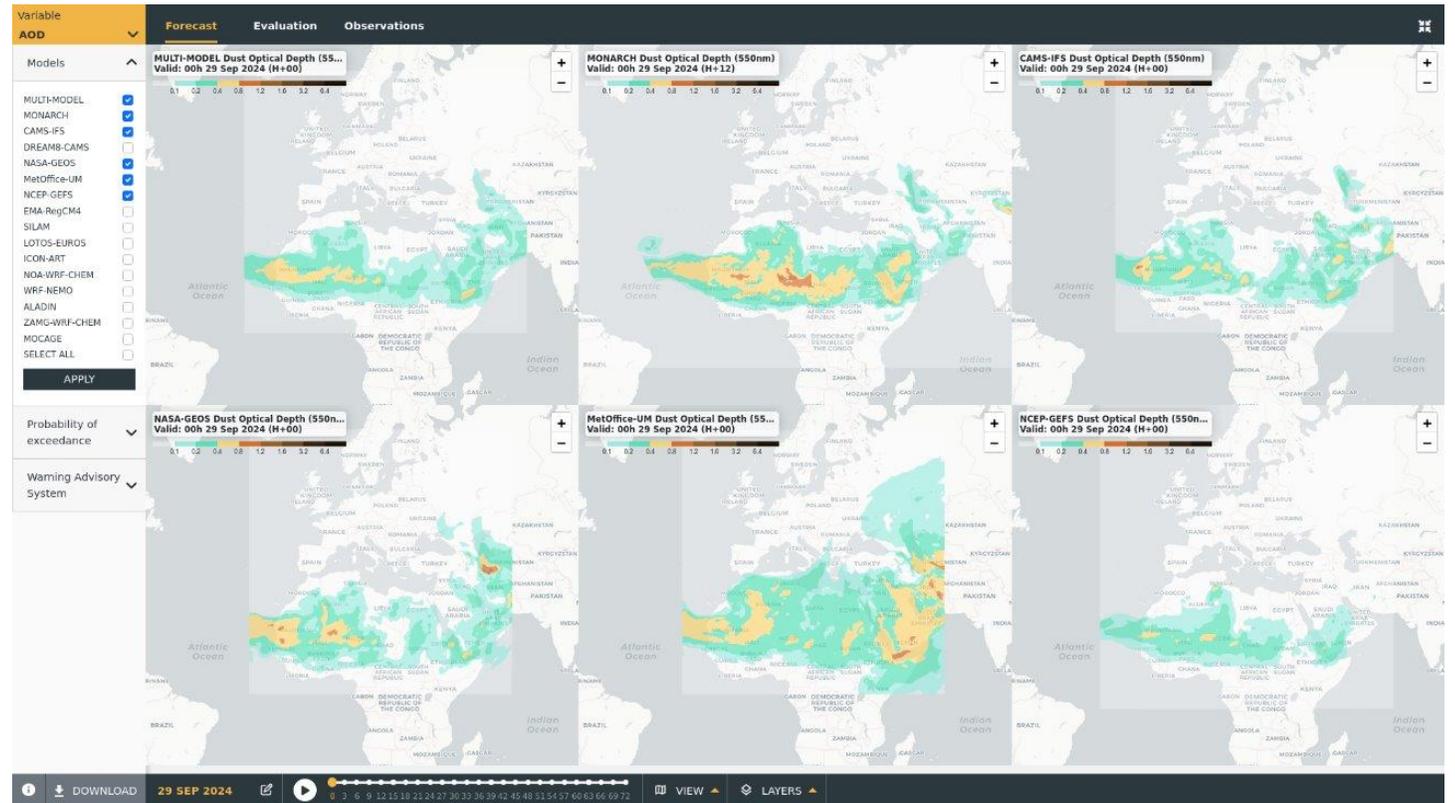
STO.02: **Enhance research management capacity and administrative skills of the ECoE infrastructure and applications** towards widening access, increased mobility and collaboration.

STO.03: **Strengthen the position of ECoE and spreading excellence** at the regional research and innovation ecosystem.



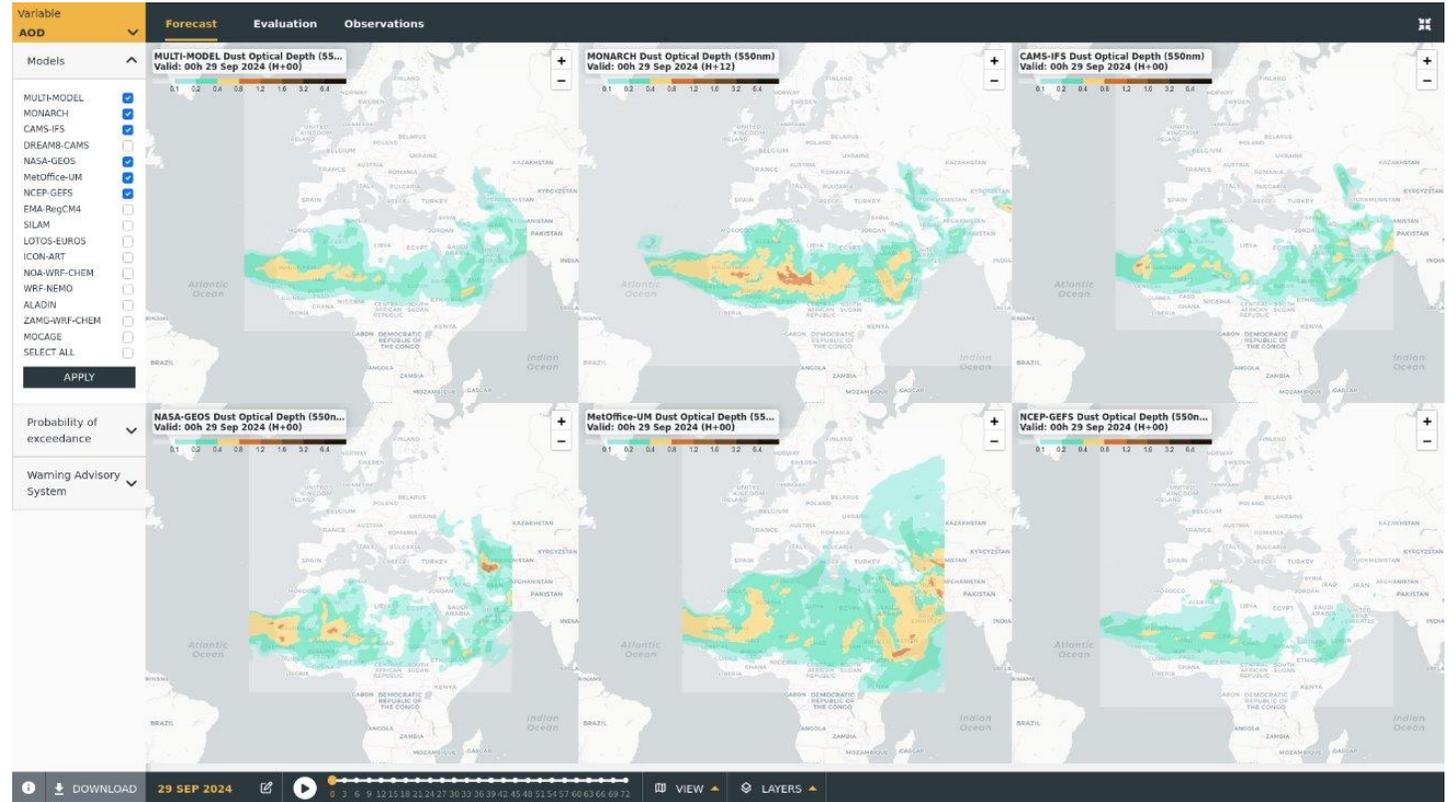
LAST YEAR PROJECT

The **research project** of the last year called **“The role of Dust to the climate”** will **use** the ground-based instruments of **CARO observatory in Limassol (Cyprus)** and the newly gained capacity in atmospheric modelling, retrievals, and synergy analysis. The main scientific question addressed by this WP revolves around the **impact of the dust storm** (or strong dust intrusions), **on microphysics retrievals, aerosol modelling, solar energy and radiation**, as well as validation of space observations against ground-based ones.



LAST YEAR PROJECT

It aims for ECoE/CARO team **to test the newly gained knowledge**, evaluating the extend of the transferred knowledge, **identifying gaps and suggest correction actions if needed**. The ERP (Exploratory Research Project) is structured in a way that **all partners are involved in at least one task aiming on synergistically provide answers to specific scientific questions on aerosol dust origin, aerosol properties and interaction with radiation etc. by using real observation of ground-based and spaceborne measurements, to test, improve and optimize the different models and retrievals.**





DISSEMINATION, EXPLOITATION AND COMMUNICATION

The last WP, related to **communication of results of the project aims to increase visibility of ECoE** by sharing the acquired knowledge with stakeholders and the public at large, to ensure the **maximum societal impact from the project** itself.

- **Printed and multimedia material** (ECoE), Activities related to preparation of **appropriate promotional material targeted mainly to the general public**.
- **Increase visibility of ECoE by sharing the acquired knowledge with stakeholders** and the public at large, to ensure the **maximum societal impact** from the project.
 - (a) the communication of CARO activities using social networks.
 - (b) a virtual tour of the CARO observatory to be made available in the project website.
 - (c) ECoE/CARO YouTube channel.
 - (d) Conferences participation and scientific papers publication.
 - (e) the organization of open CARO days.
 - (f) the educative action of science Ambassadors in schools.
 - (g) the meetings with stakeholders.
 - (h) Organization of a Special session in an International conference.



IN CONCLUSION...

- The ATARRI Project wants to fill the gap between the already existing outstanding facilities of the CARO ground based station at the Eratosthenes Centre of Excellence and the aerosol and cloud modelling.
- Several european scientific partners will help the ECoE scientists to reach the goal.
- The acquired knowledges will be proven in a last year research on dust climate impact based on the modelling of the desert dust intrusions over Cyprus island.
- Last, but not least, the dissemination, exploitation and communication tasks will bring the ATARRI activities to the attention of the broad public and the intersted stakeholders.



<https://atarri.eu/>



Funded by the
European Union

THANK YOU

This project has received funding from the European Union's Horizon Europe Framework Programme under the grant agreement No 101160258. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union.



francesco.scarlatti@eratosthenes.org.cy