"European Digital Innovation Hubs & Widening Participation" Online Event, 7th September 2020
10.00 to 11.30 CET

NCP_WIDE.NET

EXCELSIOR

ERATOSTHENES:
Excellence Research Centre for Earth Surveillance & Space-Based Monitoring of the Environment

A Digital Innovation Hub in a Centre of Excellence:
'EXCELSIOR' H2020 Widespread Teaming phase 2 project
20-05-2020

@excelsior2020eu

Professor Diofantos Gl. Hadjimitsis

EXCELSIOR Coordinator & Managing Director

Cyprus University of Technology & ERATOSTHENES Centre of Excellence

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 857510.

This project has received funding from the Government of the Republic of Cyprus through the Directorate General for the European Programmes, Coordination and Development.

CONSORTIUM

Cyprus University of Technology · DLR · TROPOS Leibniz Institute for Tropospheric Research · DEC

www.cut.ac.cy Cyprus University of Technology

www.excelsior2020.eu Excelsior H2020 Teaming Project

www.eratosthenes.org.cy ERATOSTHENES CoE

Credit: Copernicus Sentinel data (2015)/ESA

Contents

- Introduction
- The idea behind 'EXCELSIOR' H2020 Teaming Widespread Phase 2 project
- The 'ERATOSTHENES Centre of Excellence': Digital Innovation Hub
- The Quadruple Helix Innovation Model

Introduction

The EXCELSIOR project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 857510.

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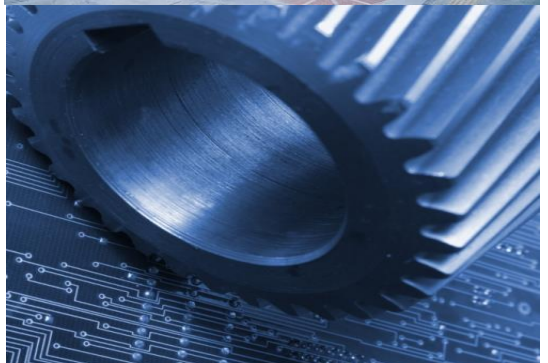
EXCELSIOR ERATOSTHENES: Excellence Research Centre for Earth Surveill & Space-Based Monitoring of the Environment

Introduction

- Cyprus University of Technology (CUT) is one of the three state universities in the Republic of Cyprus. It was founded by law on December 2003 and **welcomed its first students on September 2007**. The University consists of six faculties including the Faculty of Engineering and Technology.
- In the 2017-18 Times Higher Education World University Rankings (THE), the CUT is ranked 351-400 worldwide
- The Faculty of Engineering and Technology consists of the following 3 departments:
  - **Department of Civil Engineering and Geomatics**,
  - Department of Electrical Engineering and Computer Engineering and Informatics,
  - Department of Mechanical Engineering and Materials Science and Engineering.

Cyprus University of Technology



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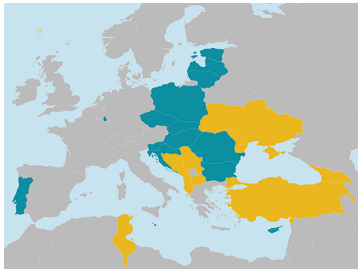
Introduction

Cyprus University of Technology

- **In 2007**, within the Department of Civil Engineering and Geomatics, **the 'Remote Sensing & Geo – Environment Lab' (Eratosthenes Research Center - ERC)** has been established with main research pillars: **Earth Observation, Remote Sensing and Geoinformatics**.
- **In 2018**, the proposal & business plan (phase2) with the acronym 'EXCELSIOR' under the H2020 WIDESPREAD TEAMING call has been submitted.
- **In 2019**, the proposal (phase2) with the acronym **'EXCELSIOR'** under the H2020 WIDESPREAD TEAMING call has been **granted**!



European Commission

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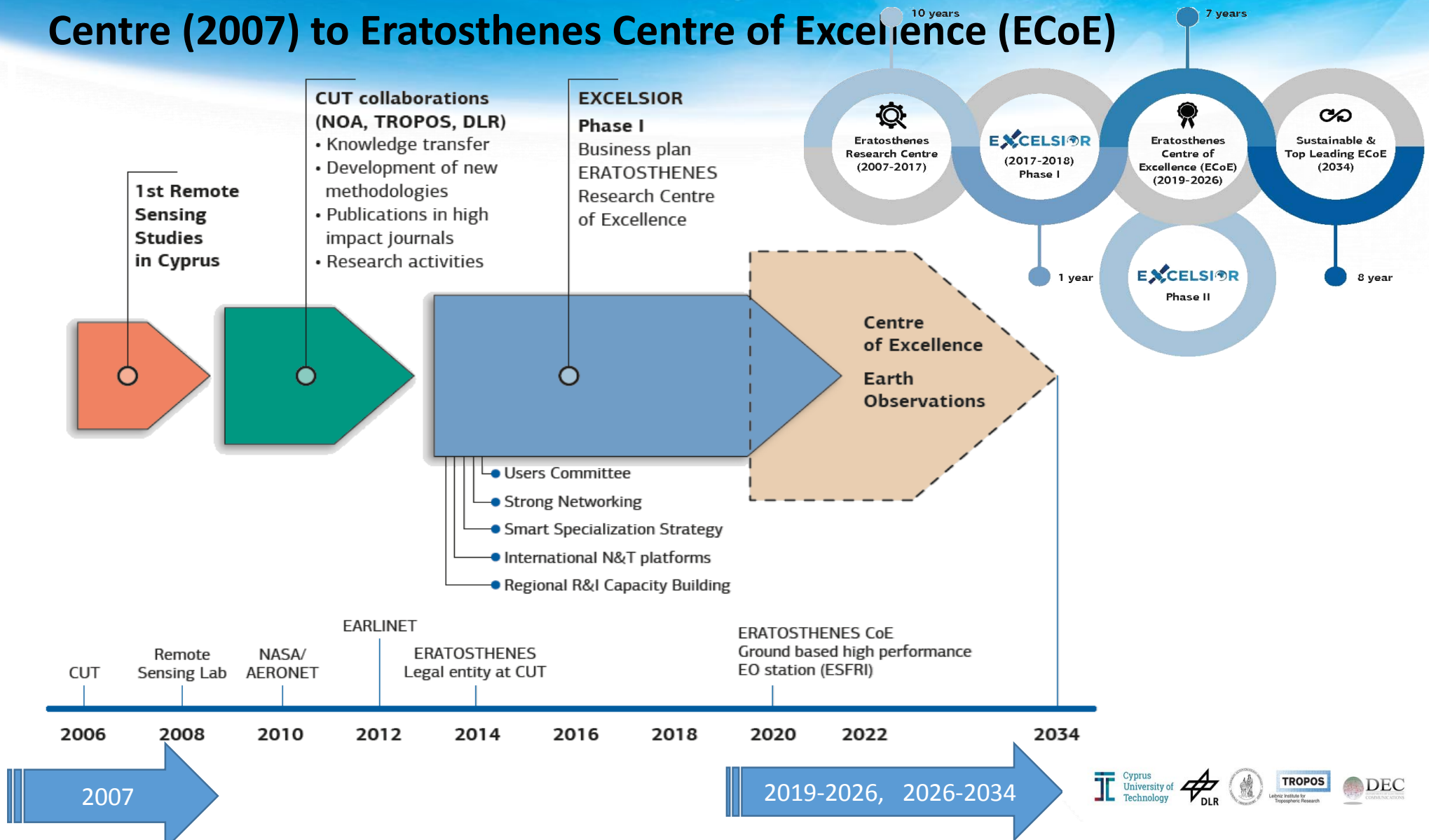
From Remote Sensing & Geo-Environment Lab/ Eratosthenes Research Centre (2007) to Eratosthenes Centre of Excellence (ECoE)



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The Excelsior H2020 Teaming Project

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EXCELSIOR ERATOSTHENES: Excellence Research Centre for Earth Surveillance & Space-Based Monitoring of the Environment

The idea behind Excelsior

Cyprus University of Technology

To upgrade the existing Remote Sensing & Geo-Environment Lab (***ERATOSTHENES Research Centre)***, established within the Faculty of Engineering & Technology of the **Cyprus University of Technology (since 2007)**, into a ***sustainable, viable and autonomous Centre of Excellence: the ERATOSTHENES Centre of Excellence (ECoE)***

Cyprus University of Technology

The Eratosthenes CentrE of Excellence (ECoE) for Earth Surveillance and Space-Based Monitoring of the Environment will provide the **highest quality** of related services both on the **National, European and International** levels through **'EXCELSIOR' Project under H2020 WIDESPREAD TEAMING**.

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ERATOSTHENES: Excellence Research Centre for Earth Surveillance & Space-Based Monitoring of the Environment

Cyprus University of Technology

Cyprus University of Technology

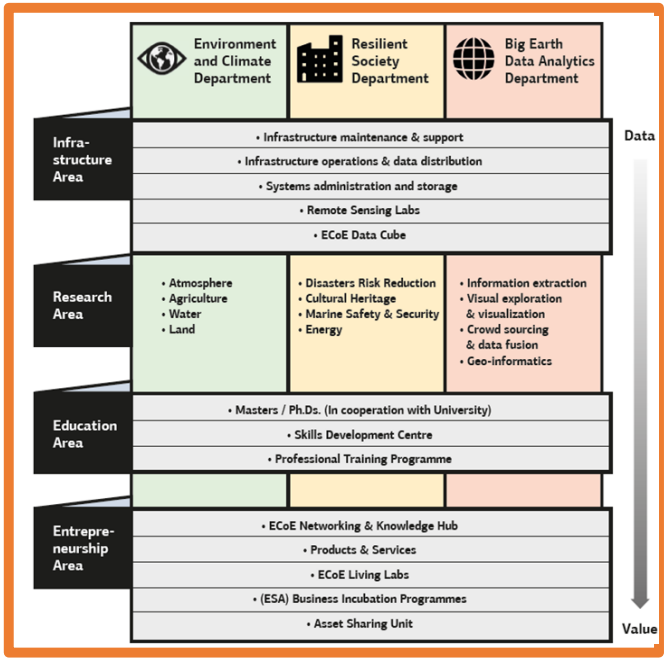
ERATOSTHENES RESEARCH CENTRE

EXCELSIOR

ERATOSTHENES Centre of Excellence

The mission: To upgrade the existing ERC (12 years experience) into a self-sustainable Centre of Excellence in Earth Observation (EO), recognised at an International level

The vision: The ECoE **will become a world-class Digital Innovation Hub** and a Research Competence Centre for Earth Observation and Geospatial Information by offering education, research, innovation and application services capable of sustaining Cyprus development and of actively contributing to the European Research Area (ERA) as well as becoming the reference EO/GI Centre for research and innovation in the EMMENA area.



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EXCELSIOR Consortium

Cyprus University of Technology

DEC DEPARTMENT OF ELECTRONIC COMMUNICATIONS

Prof. Diofantos G. HADJIMITSIS - Coordinator

Mr. Georgios KOMODROMOS

ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ ΑΘΗΝΩΝ NATIONAL OBSERVATORY ATHENS

IAASARS

BEYOND Centre of EO Research & Satellite Remote Sensing

Dr. Haris KONTOES

DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center

Mr. Gunter SCHREIER

Dr. Albert ANSMANN

TROPOS

Leibniz Institute for Tropospheric Research

Cyprus University of Technology

DLR

TROPOS Leibniz Institute for Tropospheric Research

DEC DEPARTMENT OF ELECTRONIC COMMUNICATIONS

Our Team (before the submission)!

Our Team (during kick off, Nov 2019)!

Public inauguration of Excelsior by the President of the Republic of Cyprus: 22/11/2019

- The public inauguration event of the strategic research project ‘EXCELSIOR’: ERATOSTHENES: Centre for Excellence in Land Surveillance and Environmental Monitoring was successfully held on the 22nd of November 2019.
- The event took place at the Cyprus University of Technology under the auspices of the President of the Republic of Cyprus, Mr. Nicos Anastasiades.


Τεχνολογικό Πανεπιστήμιο Κύπρου
CUTingedge
AN AMERICAN SPACE


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External Advisory Board

Name	Position	Organisation
Dr. Vincent Ambrosia (M)	Associate Program Manager NASA Applied Sciences Program	NASA/California State University (**USA**)
Dr. Marcello Maranesi (M)	International business experience in Geo-Spatial Information and Earth Observation	Independent consultant (**Italy**)
Prof. Lena Halounová (F)	Head of the Remote Sensing Laboratory/ IPSRS Secretary General	Czech Technical University (**Czech Republic**)
Dr. Peter Zeil (M)	Senior expert in the field of EO services and applications	Spatial Services GmbH (**Austria**)
Dr. Simonetta Cheli (F)	Head of Coordination Office	ESA Headquarters
Mr. Daniel Barok (M)	Senior Space Consultant	SpaceFarma (**Israel**)

NASA

esa European Space Agency

isprs information from imagery

CZECH TECHNICAL UNIVERSITY IN PRAGUE

Cyprus University of Technology

DLR

TROPOS Leibniz Institute for Tropospheric Research

DEC

Why this consortium?

The **strategic partners** of the EXCELSIOR project form a **highly complementary team** possessing the full range of skills and expertise necessary to technically assist and carry out the proposed activities successfully.

- **DLR will support the planning and establish a satellite receiving station** including attached processing and archiving functions with the possibility of a direct data flow into EO-based services and networks.

- **NOA will seek to establish sustainable links between the ERATOSTHENES CoE (ECoE)**, and the **BEYOND Centre of Excellence**, which is established in the **European Research Area** as a regional **Copernicus node** for EO-based monitoring.

- **TROPOS** will be the key partner for the establishment of a **ground based Remote Sensing station** in ERATOSTHENES CoE, providing close links between European networks and satellite validation activities.

- **DEC-MTCW** will **provide the links to the local and governmental community** and **promote** space issues on the national level

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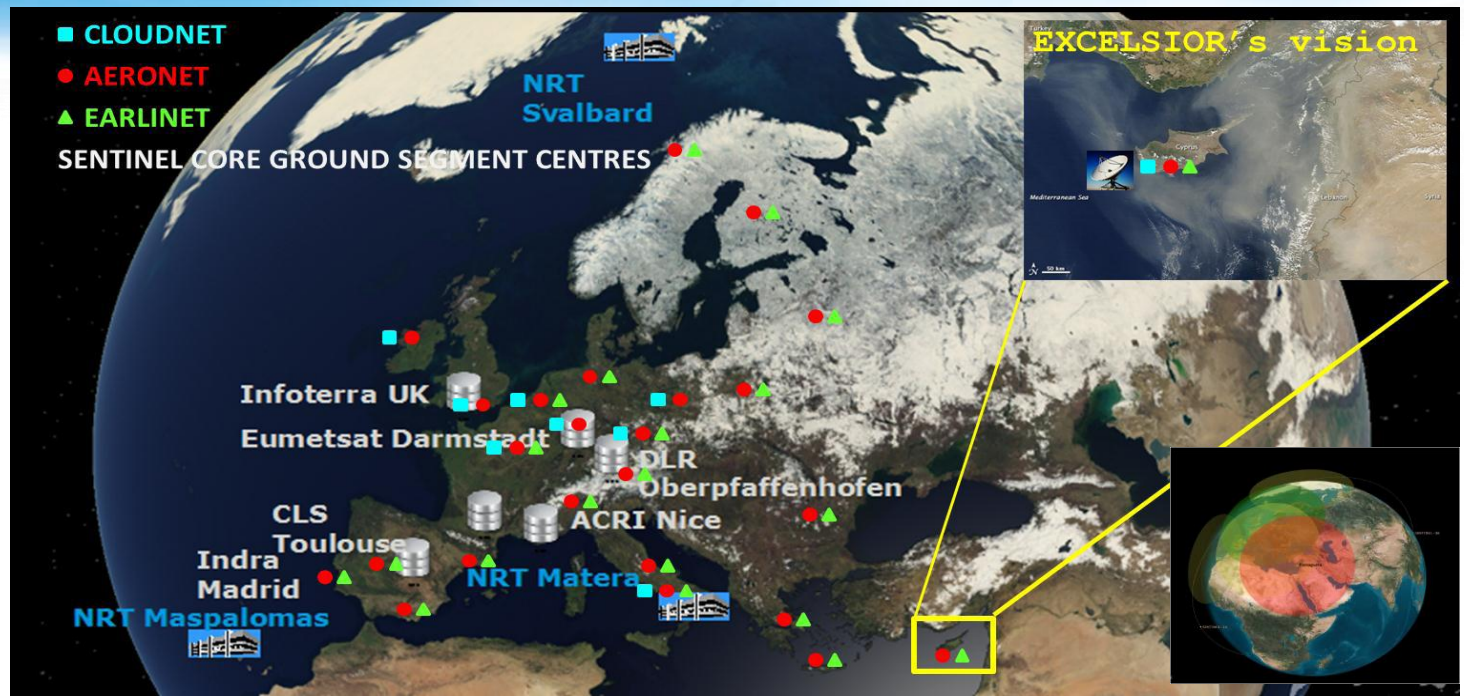
ERATOSTHENES: Excellence Research Centre for Earth Surveillance & Space-Based Monitoring of the Environment

Why Cyprus?

Cyprus's **unique geostrategic position** can support Earth Observation from satellites programmes in three continents and provide valuable services in the satellite **calibration and validation** processes.

The **ERATOSTHENES CoE** – with its expertise and infrastructure could further **complete the existing network of international ground stations**.



The ***EXCELSIOR's*** vision and the geostrategic position of Cyprus

Cyprus is ideally located to host the ECoE, due to its **climate**, which is characterised by **300 days of sunshine a year**, providing **excellent weather conditions** for **cloud free** satellite images!

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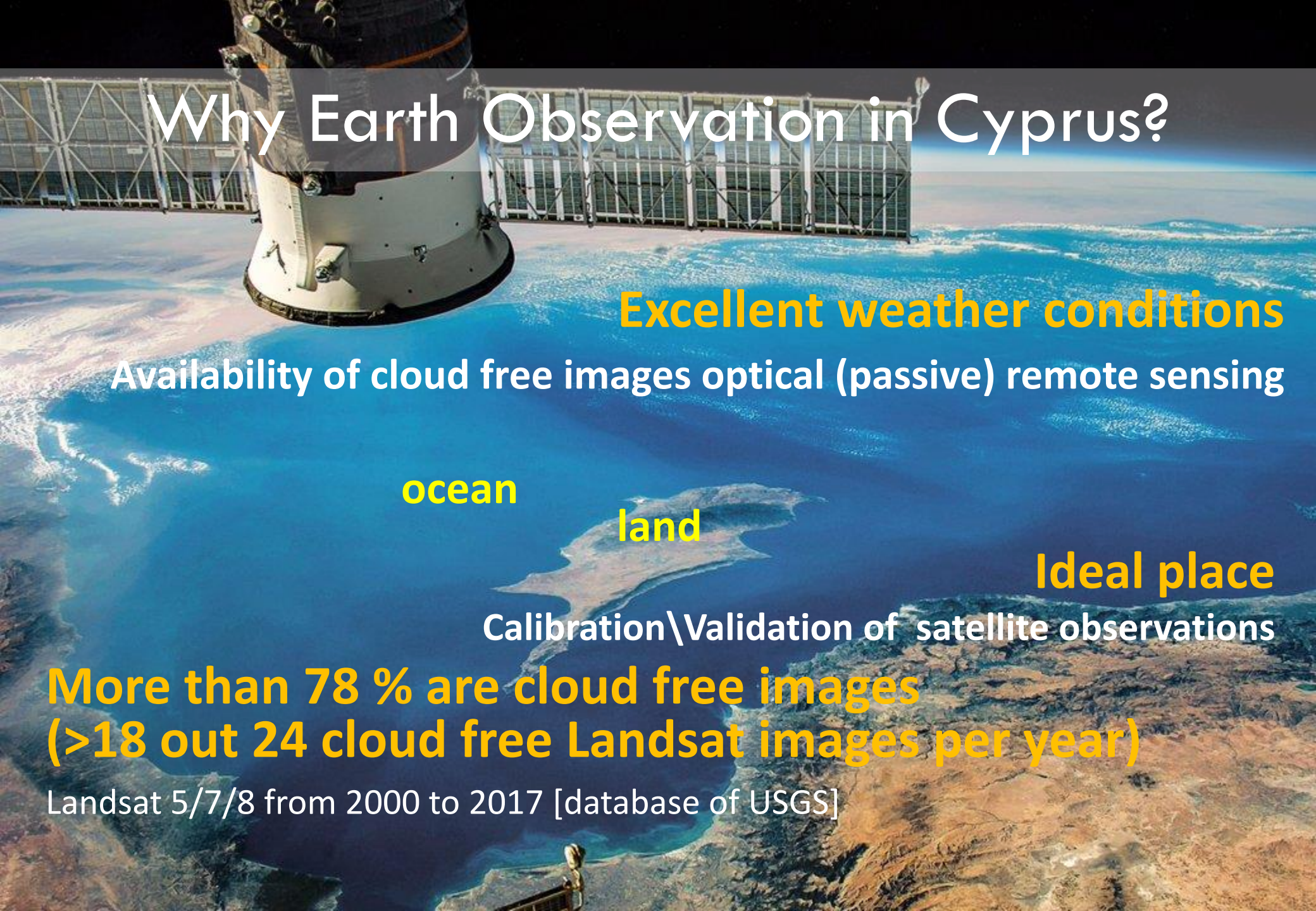

Why Earth Observation in Cyprus?

Excellent weather conditions

Availability of cloud free images optical (passive) remote sensing

ocean

land

Ideal place

Calibration\Validation of satellite observations

More than 78 % are cloud free images
(>18 out 24 cloud free Landsat images per year)

Landsat 5/7/8 from 2000 to 2017 [database of USGS]

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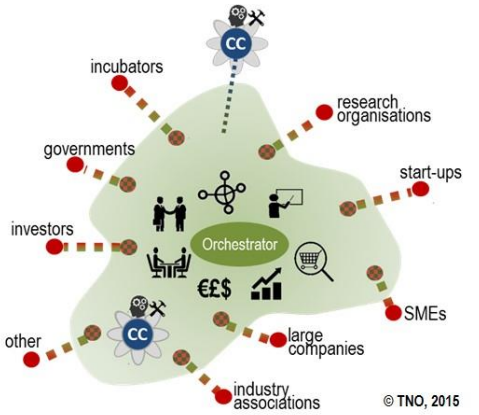
Why ECoE? Needs

There are some distinct needs and opportunities that motivate the establishment of **an Earth Observation Centre of Excellence in Cyprus**.

Needs:

- **Supersite for aerosol and cloud monitoring in the Eastern Mediterranean, Middle East and North Africa (EMMENA) :** strong demand for EO monitoring to provide data to evaluate the extent of pollution and climate change, especially in the EMMENA region
- **Droughts and water shortages in the EMMENA region**
- **Rehabilitation programmes in EMMENA**
- **Disaster Risk Reduction**
- **'Regional Digital Innovation Hub for Earth Observation in Cyprus'**



Cyprus University of Technology DLR TROPOS Leibniz Institute for Tropospheric Research DEC

Why ECoE? Opportunities

- **The ECoE** has the **potential** to become **a catalyst** for **facilitating and enabling Regional, European and International cooperation.**
- **Capitalise** on the favourable **environmental, weather and climatic conditions of Cyprus** to conduct **cutting-edge research** with **impact** in **various sectors**, including **climate change**, **marine**, **solar energy**, **etc**.
- **The development of the Government of the Cyprus space strategy can be exploited for further EO research and applications**
- Create a unique European capacity in Cyprus by **mobilizing internal national assets** and **consolidating European EO capabilities** in Cyprus to serve EMMENA. Such, currently missing, assets and infrastructures are: **European Satellite Ground Stations covering EMMENA.**
- **Availability of funding instruments for EO national and European Level**
- **Big Data management and analytics**

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Why ERATOSTHENES?

- **ERC: ERATOSTHENES RESEARCH CENTRE** is the **only established Centre** in Cyprus for Space-based EO, Remote Sensing and Geo-informatics.
- **Has 13 years** of operation,
- **Participated** in more than 70 research projects
  - **Coordinated** more than 30 research projects.
- **Secured funding** from various competitive sources such as:
  - National,
  - European Union,
  - Industry

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HORIZON 2020

esa

Life

SEVENTH FRAMEWORK PROGRAMME

Research Promotion Foundation

REPUBLIC OF CYPRUS

EUROPEAN UNION

STRUCTURAL FUNDS of the European Union in Cyprus
our ideas, actions for development

Cyprus University of Technology

DLR

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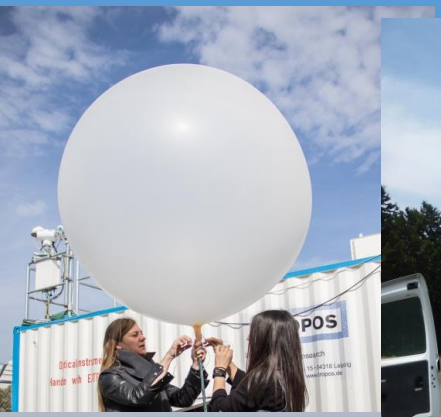
DEC

team in action……..



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Networks

Existing **'Stakeholder Hub of Eratosthenes'** consists more than **500 members from Europe and International Level..!**

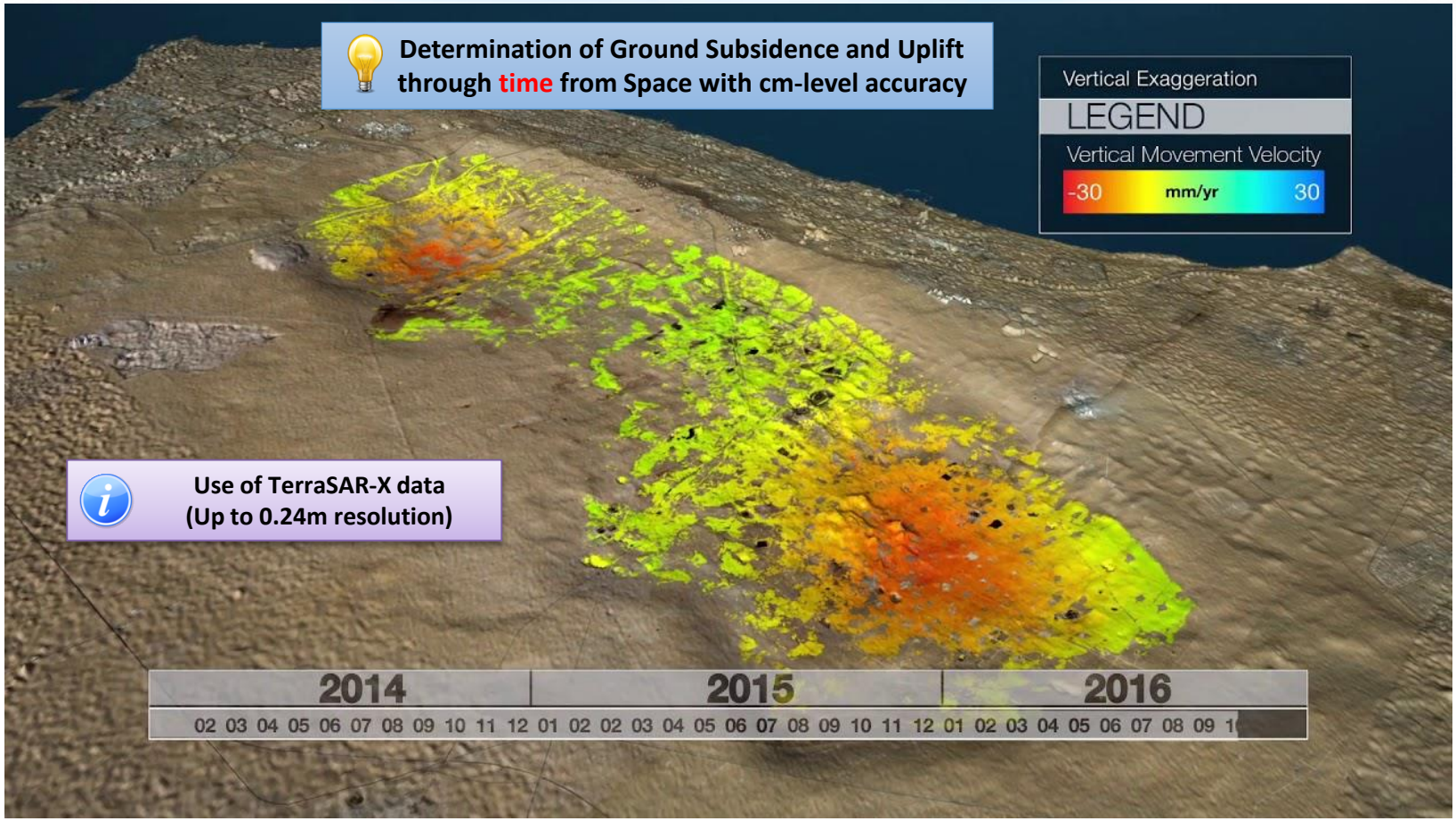
Why Satellite Remote Sensing?

- **Synoptic view:** It facilitates the study of various features of earth surface and their spatial relation to each other & helps to delineate the required features & phenomenon.
- **Cost effective:** Compared to traditional ground techniques
- **Accessibility:** It makes it possible to gather information about inaccessible areas where it is not possible to gather information through ground surveys.
- **Time-Saving**: These techniques save time & efforts as information about large area can be gathered quickly.
- **Multidisciplinary applications**: Remote sensing data are useful to different disciplines such as forestry, land use, IT, meteorology, engineering, agriculture etc.

Previous experience in Remote Sensing since 2007 at CUT (Cyprus)

- Integrated use of remote sensing & geoinformatics for the systematic monitoring of the environment
- Applications in: Natural and Built Environment

Deformation Monitoring from Space



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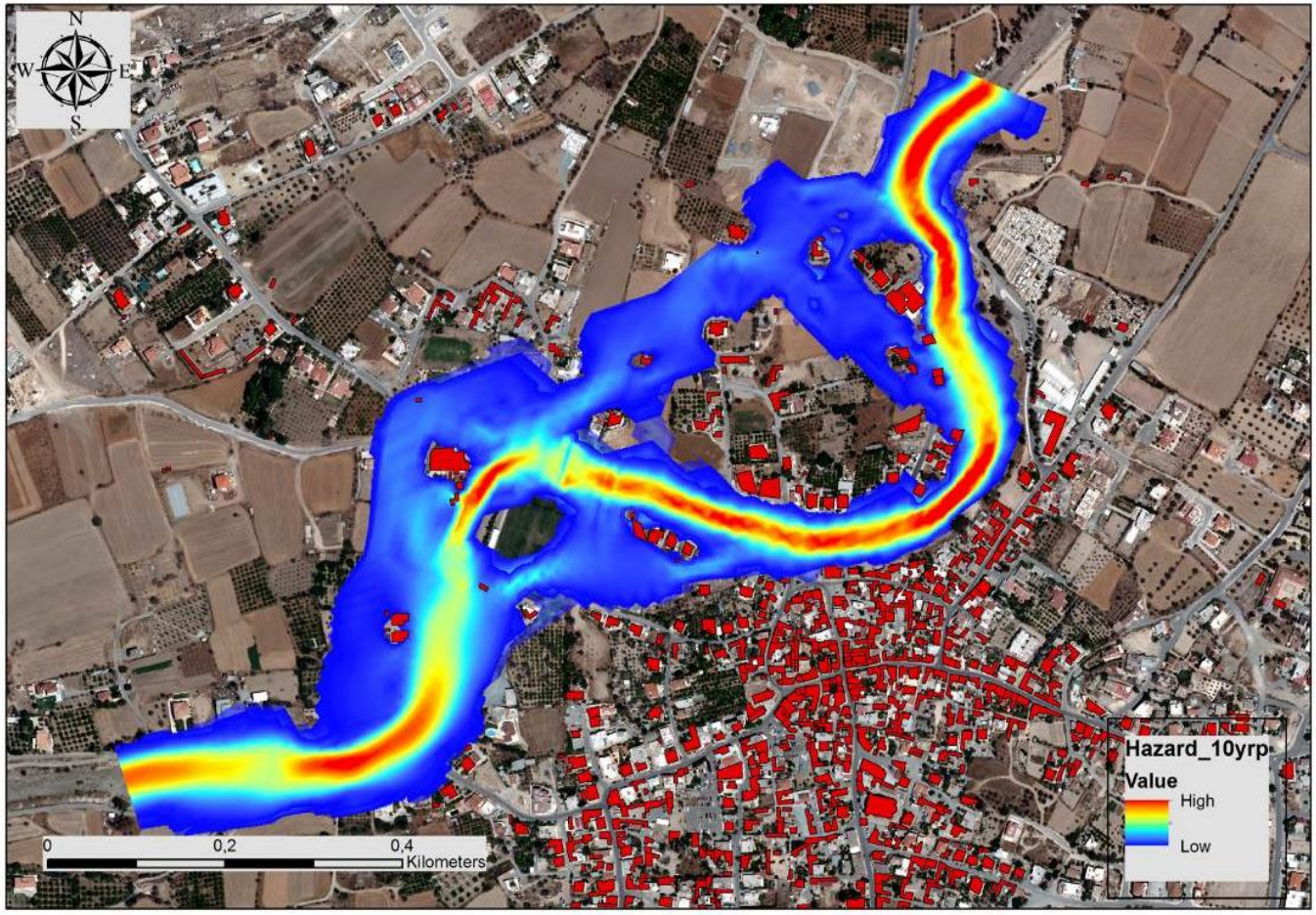
EXCELSIOR RESEARCH

Flood Risk Analysis from Space



Integrated Use Of Satellite Remote Sensing And Hydraulic Modeling For The Flood Risk Assessment at a catchment Scale In Cyprus

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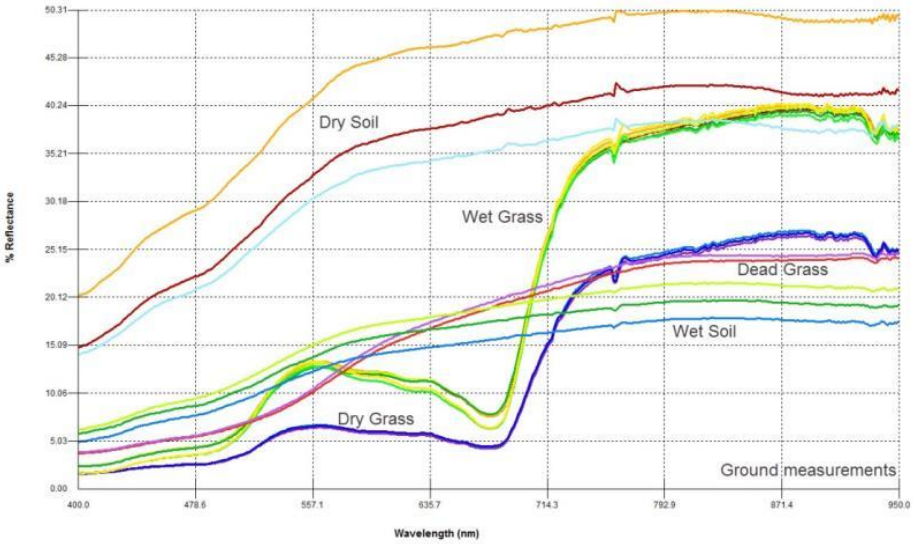
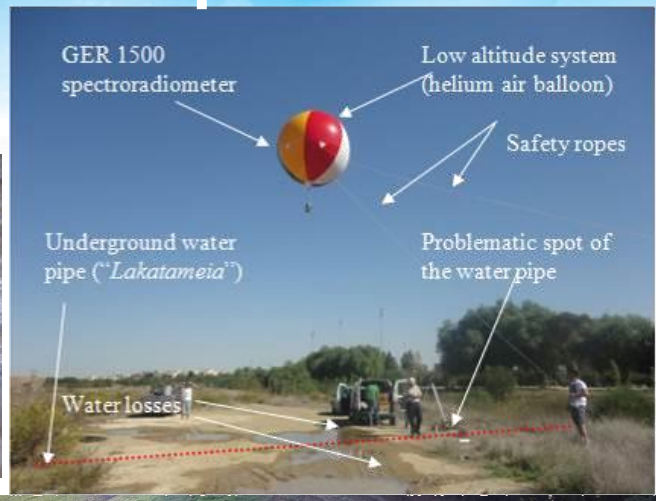
Water Leakage Detection from Space





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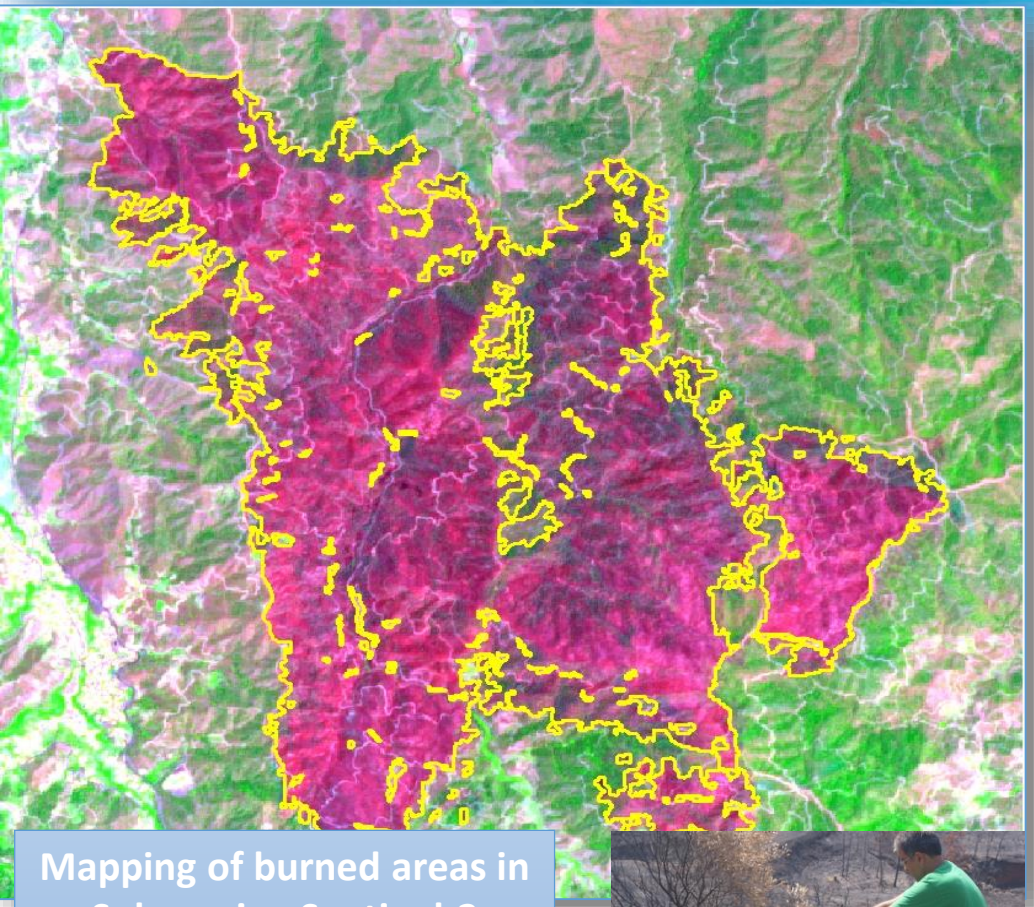
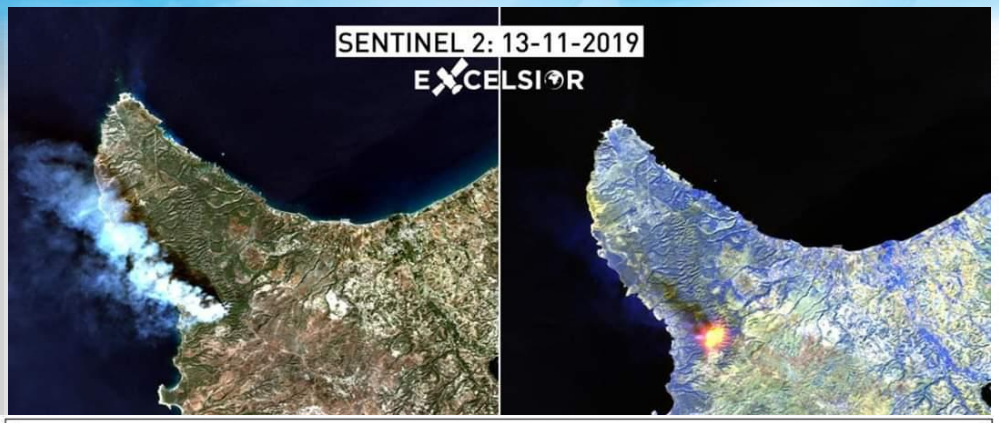
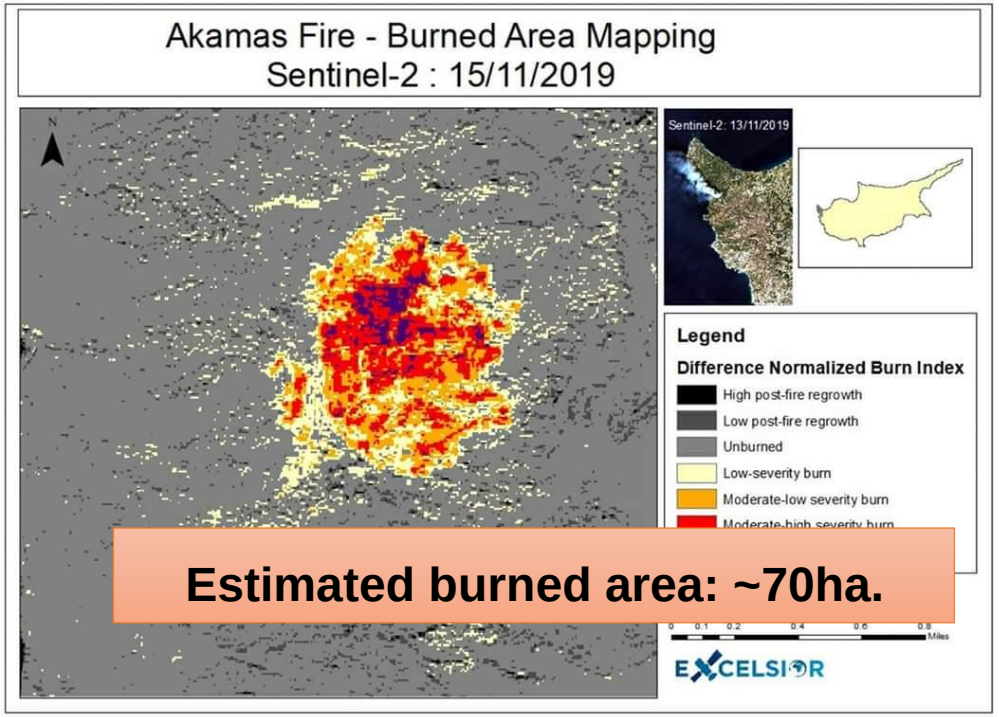
EXCELSIOR RESEARCH

Fire Detection from Space



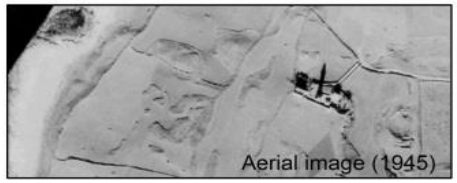
Mapping of burned areas in Solea using Sentinel-2
28/6/2016
16.4 sq.km2
(7-5-3)





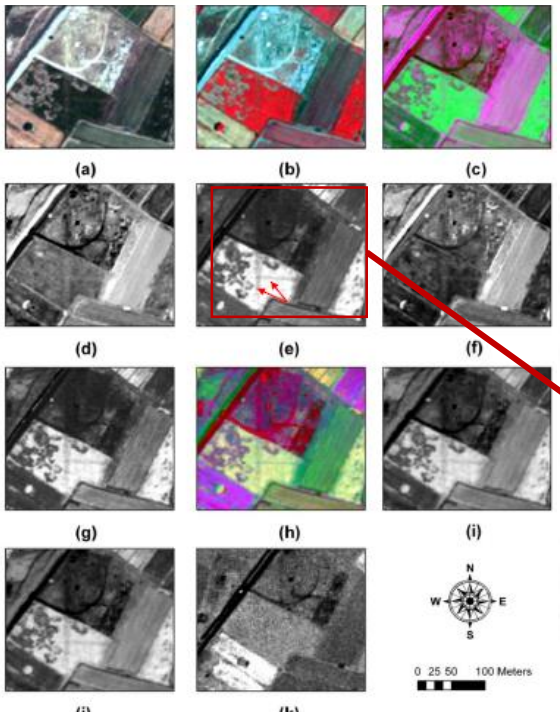
Estimated burned area: ~70ha.

Managing Cultural Heritage from Space

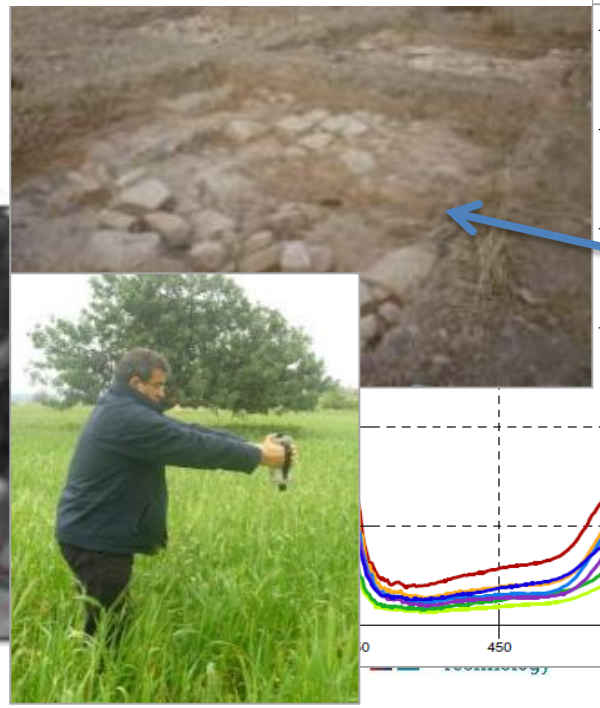


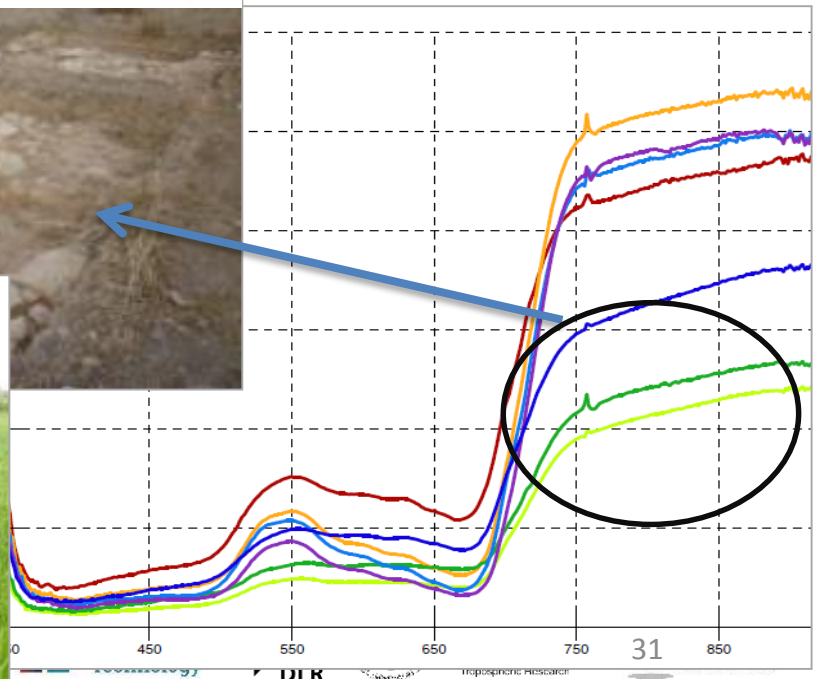
Study of Unexcavated Archaeological Sites

detection of unexcavated buried remains



Fusion of RS data





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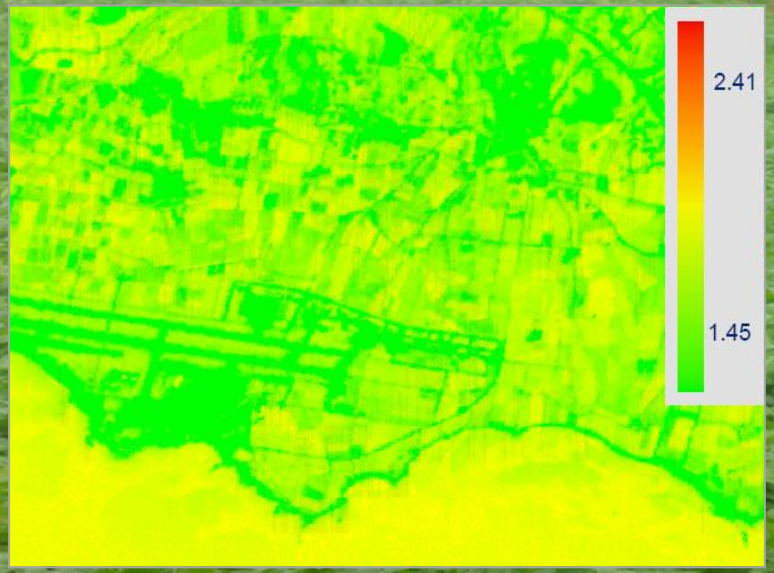
RESEARCH

Agricultural Applications from Space

Integration of:

- **Spectroscopy**
- **Micro-sensor technology**
- **Remote sensing**



Irrigation Demand,
Supporting Agricultural Payments
Precision Agriculture

SWSOIP: Smart Watering System for Optimising Irrigation Process / ESA PECS
WEBSITE: www.swsoip.com

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SignalGenerix

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RESEARCH

Air pollution and Climate Change

Anthropogenic pollution

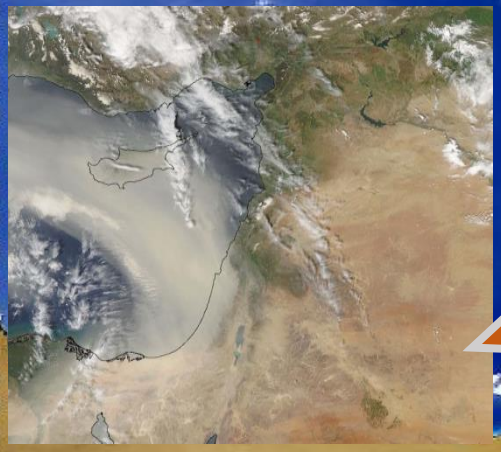
Haze and fire smoke

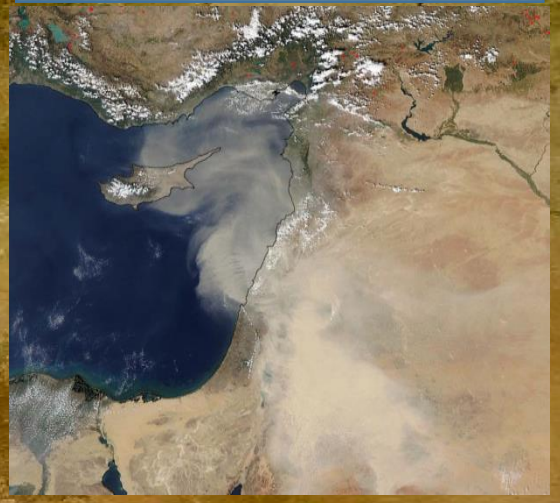
Cyprus

Saharan mineral dust

Middle East dust

Cy-CARE campaign
BACCHUS project
ACTRIS Network





Aerosol's direct and indirect effect

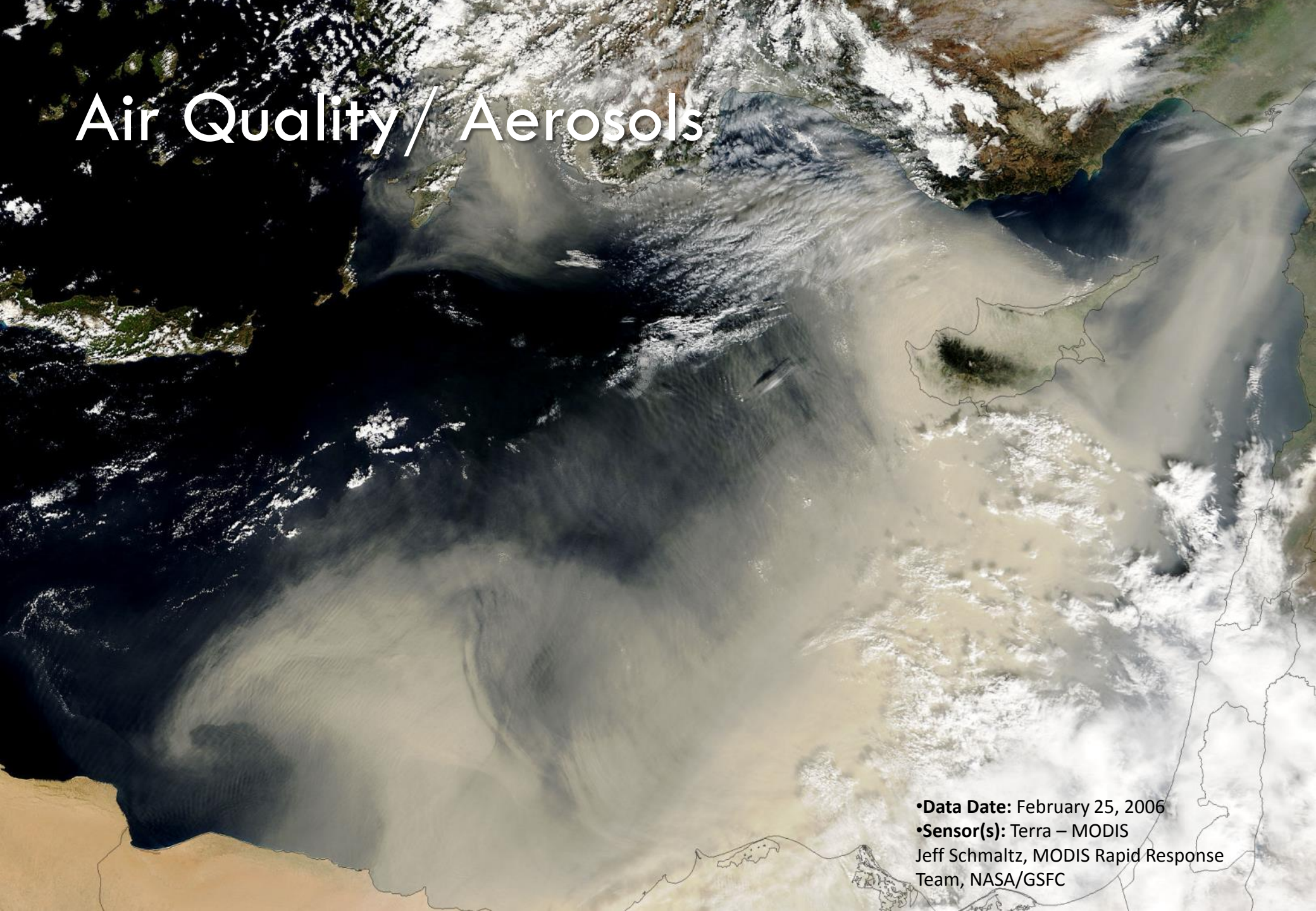
Intense events and complex aerosol mixtures in the Eastern Mediterranean

ONE step BEYOND workshop, 15 October 2015 ESA - Frascati, Italy

TROPOS
Leibniz Institute for Tropospheric Research

SEVENTH FRAMEWORK PROGRAMME

Air Quality/ Aerosols



•**Data Date:** February 25, 2006
•**Sensor(s):** Terra – MODIS
Jeff Schmaltz, MODIS Rapid Response Team, NASA/GSFC

Maritime Awareness/ Ship- Detection

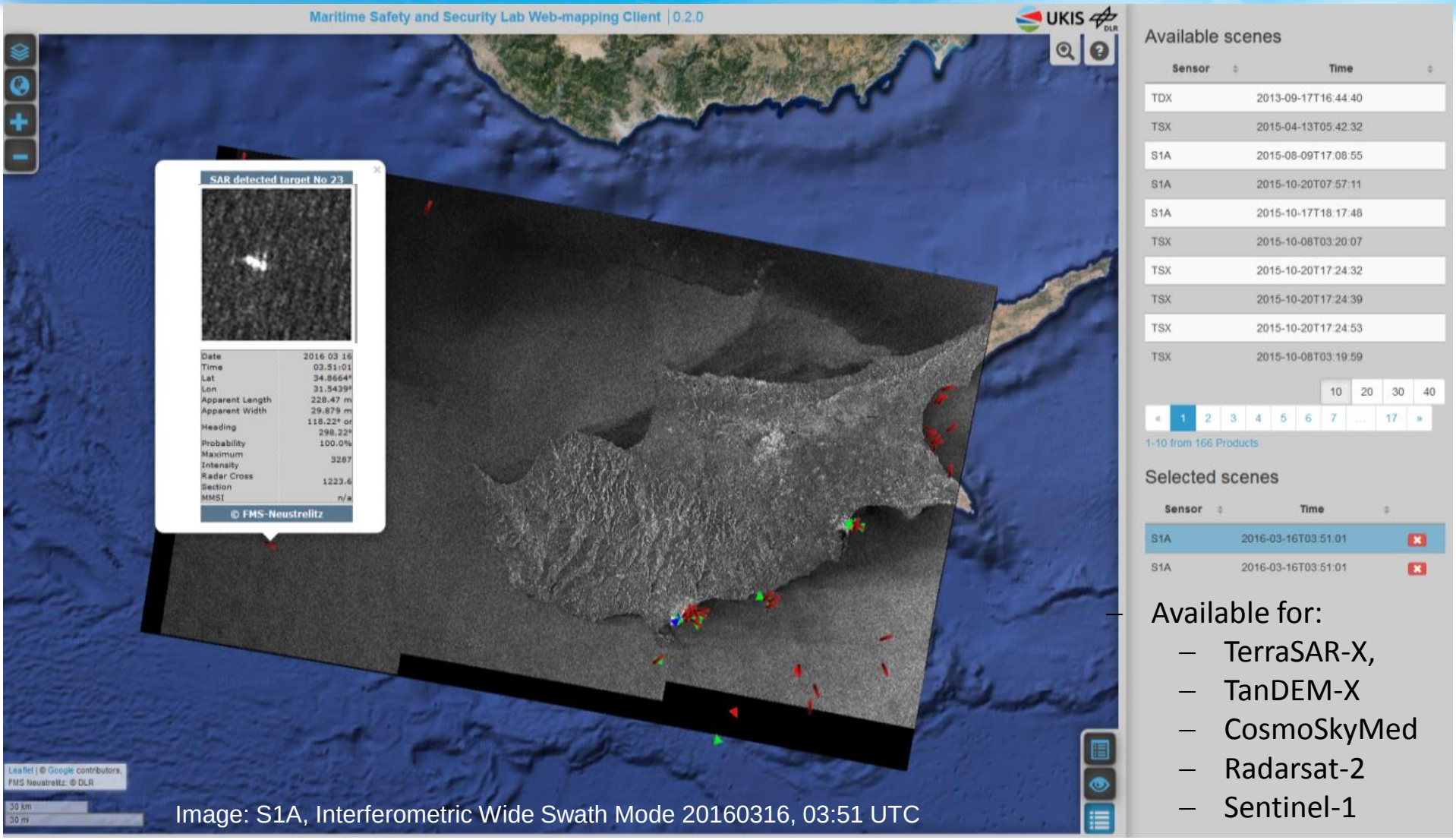
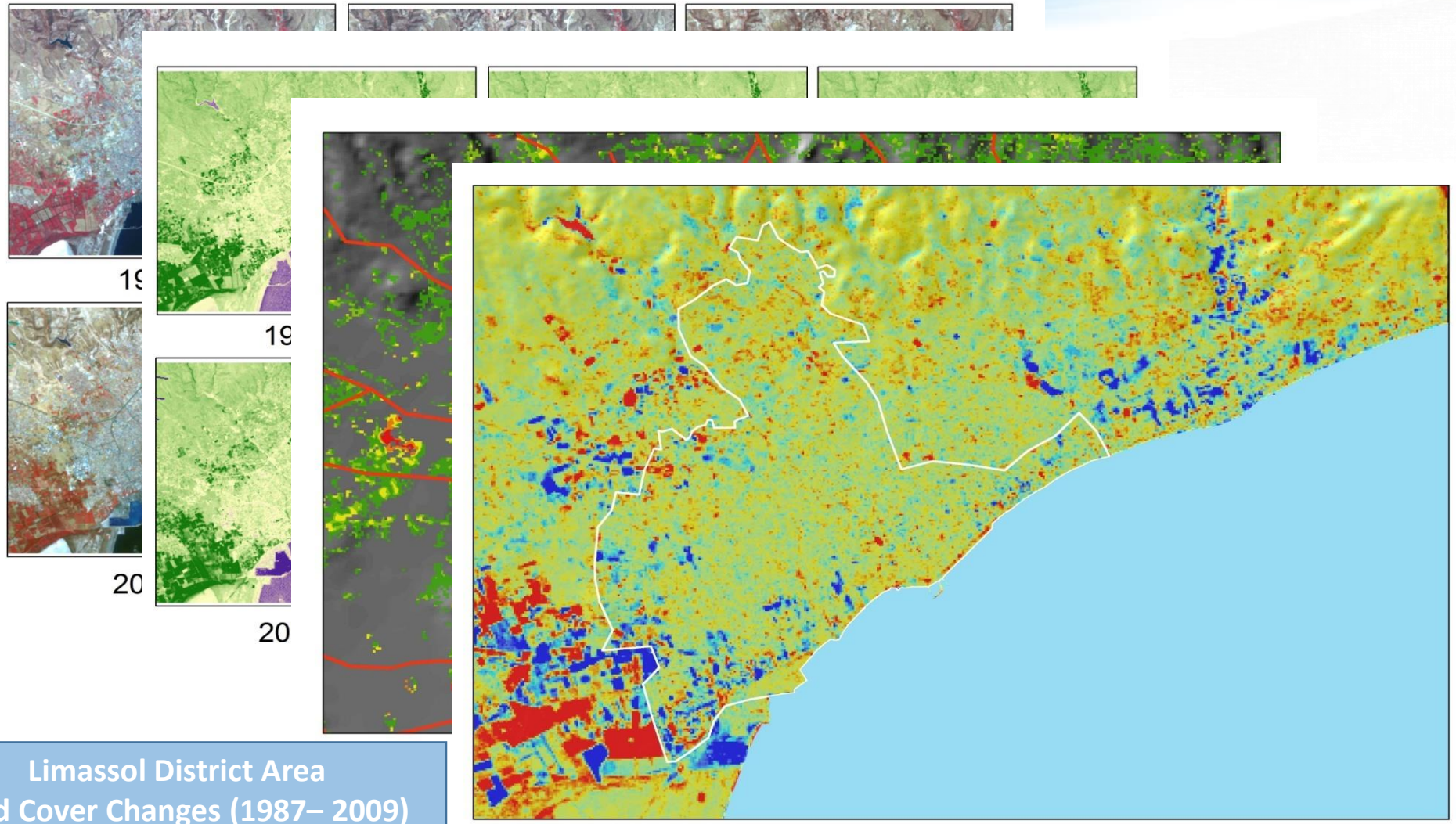


Image: S1A, Interferometric Wide Swath Mode 20160316, 03:51 UTC

- Available for:
  - TerraSAR-X,
  - TanDEM-X
  - CosmoSkyMed
  - Radarsat-2
  - Sentinel-1

Land-cover changes



Limassol District Area
Land Cover Changes (1987– 2009)

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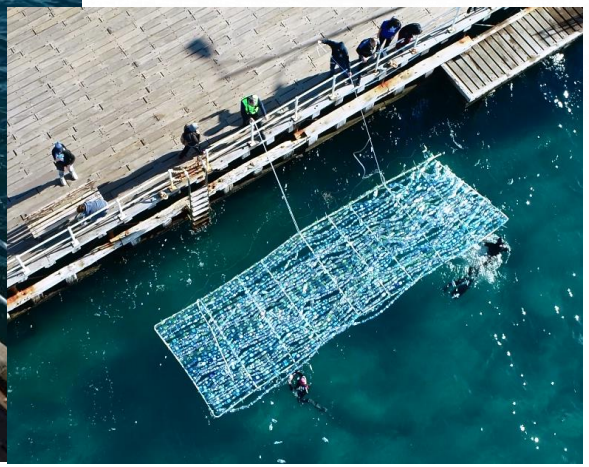
EDUCATION

Promoting Space Education

School Competitions

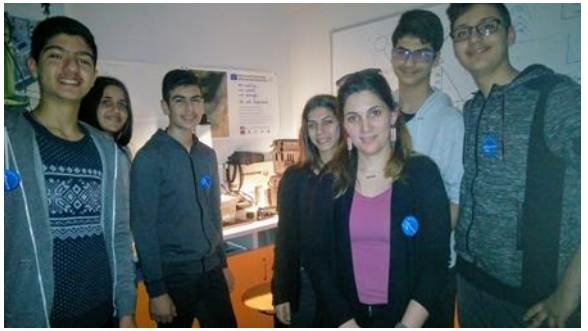
- « Stockholm Junior Water Prize »
- «Cyprus Contest for Young Scientists »
- «MEPA TEKE»

- **Investigating detection of floating plastic litter from Space**
- **Support Students to participate at school competitions such as the Stockholm Junior Water Prize**
- **Our school team was awarded the Cyprus prize and was selected to represent Cyprus at the National competition**



SIWI STOCKHOLM JUNIOR WATER PRIZE

CyCYS



Cyprus University of Technology

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EXCELSIOR

ERATOSTHENES: Excellence Research Centre for Earth Surveillance & Space-Based Monitoring of the Environment

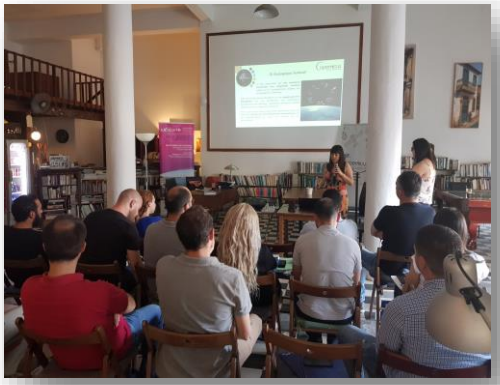
Promoting Space Education

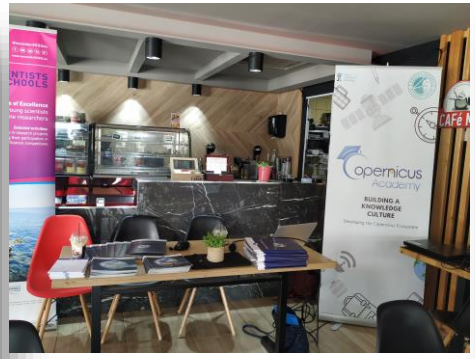
ECoE For Young Scientists & Schools

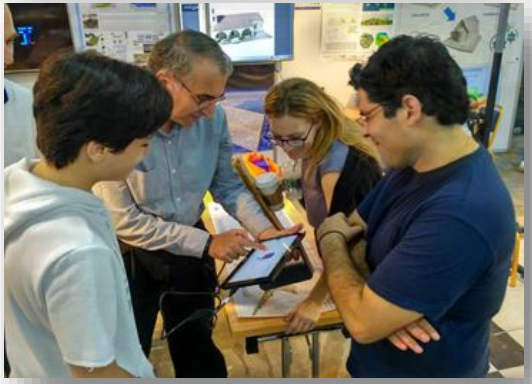
EXCELSIOR @excelsior2020eu www.excelsior2020.eu

EDUCATION

#Copernicus Academy #CopHub.AC #Science Café #Sofia ESA PECS # Researchers Night







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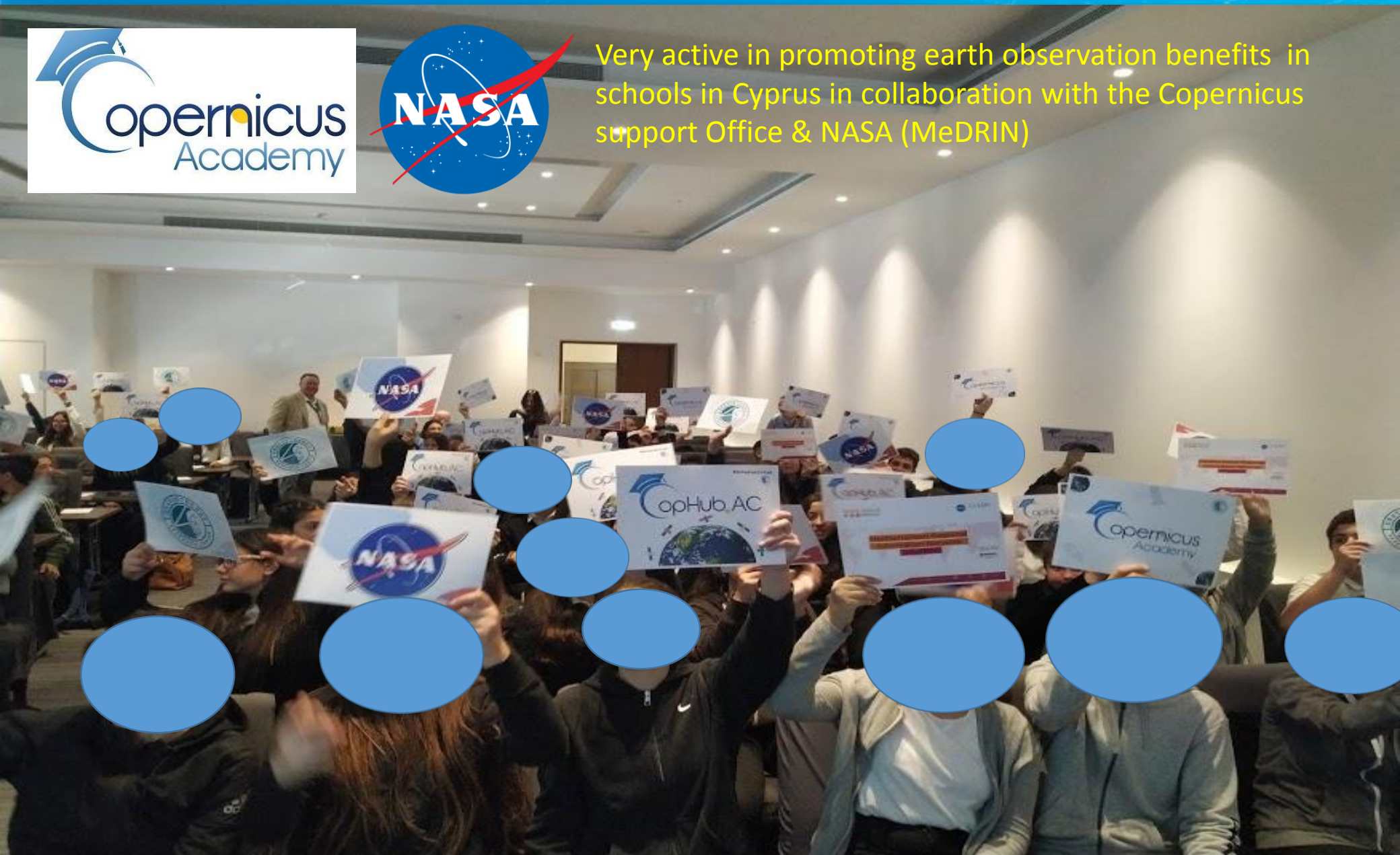
RSCy2018
RSCy2018


European Commission
COPERNICUS
Training and
Information Session
opernicus
Europe's eyes on Earth
Space

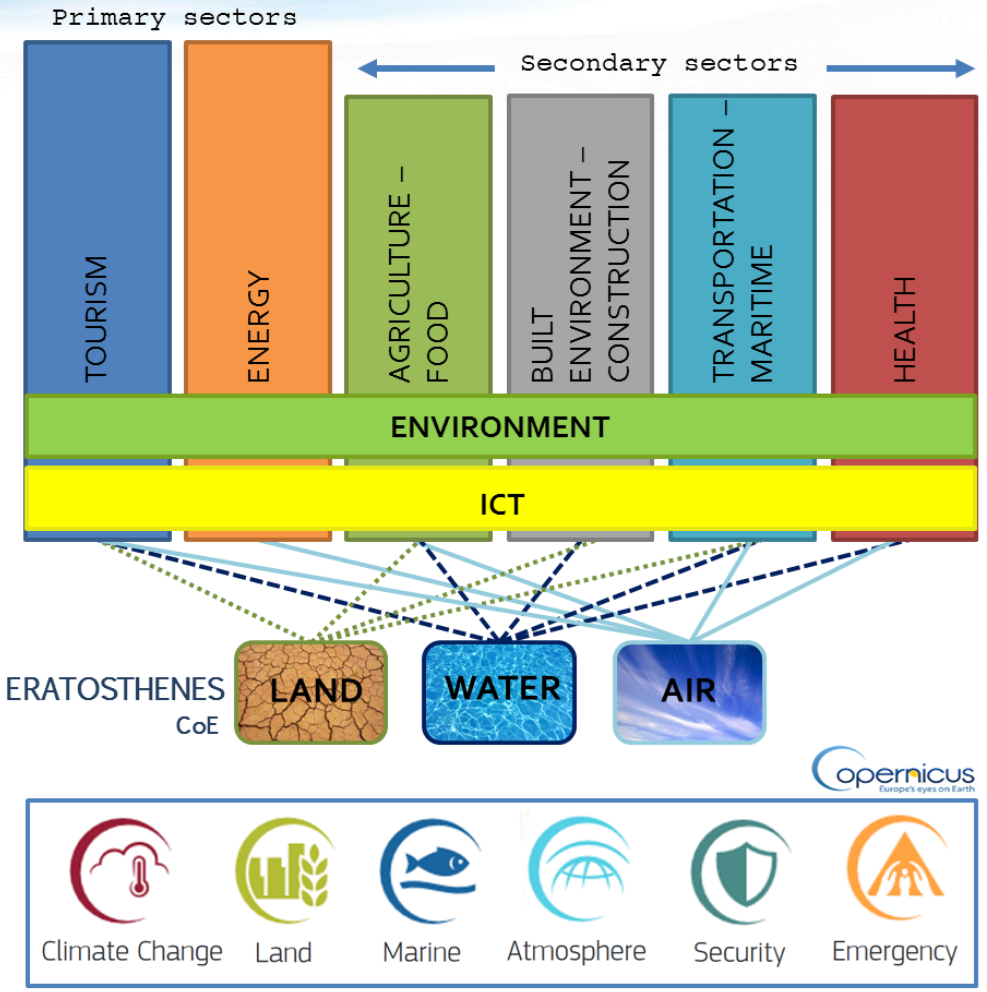
Very active in promoting earth observation benefits in schools in Cyprus in collaboration with the Copernicus support Office & NASA (MeDRIN)



Why Space fits within the S³Cy?

In **relation** to the **Copernicus trend**, which provides products and services on Land, Marine and Atmosphere monitoring as well as on Emergency management, Security and Climate Change, **ECoE** is **organized** in **three (3) main Research Thematic Areas**, i.e. **Land**, **Water** and **Air**.

These three (3) **Research Thematic Areas** of the ECoE **embrace all six (6) Copernicus services and interact with the priorities of S³Cy**



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Why Excelsior?

'Space-based Earth Observation where three Continents meet' facing common challenges for making citizens and societies resilient to sustainable development

In our capacity as a **consortium** acting in the domains of Earth Obervation (EO), Geospatial Information (GI) and Space Applications:

✓***We are motivated*** from the fact that the **European Commission will invest 16bn € in Space, building upon Galileo, and Copernicus.**

✓***We see opportunity*** *in the fact that the Cyprus Government* is investing to become full European Space Agency (ESA) member

✓***We are inspired*** from the fact the Earth Observation (EO) has been identified by ESA experts, as one of the three domains for potential future Plan for European Cooperating States projects in Cyprus

✓***We are aligned*** *with the Smart Specialisation Strategy for Cyprus*

✓***We are pushed*** by Cyprus University of Technology (CUT) that has committed to invest 8M € (15 Yrs) and the additional 15M € (15 Yrs) from the GOV of Cyprus

✓***We feel the responsibility*** since Eratosthenes Research Center (ERC) **is the only EO center in Cyprus (since 2007)**

✓***We are stimulated*** from our mission to upgrade the ERC to **ERATOSTHENES Centre of Excellence (ECoE)**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 857510.

This project has received funding from the Government of the Republic of Cyprus through the Directorate General for the European Programmes, Coordination and Development.

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Funded under H2020 & Republic of Cyprus

Pillar: **Spreading excellence and widening participation**

Work Programme Year: **H2020-2018-2020**

Work Programme Part: **Spreading Excellence and Widening Participation**

Call: **H2020-WIDESPREAD-2018-2020**

Topic: **WIDESPREAD-01-2018-2019 Teaming 2**

Type of action: **CSA (Coordination and support action)**

Grant Agreement number: **857510,** Acronym: **EXCELSIOR**

Total Budget: **44,000,000 €**

(15 millions from EC+ 15 from Republic of Cyprus+ 8 millions from CUT etc)

Duration: **7 Years (EC) + 8 years (Republic of Cyprus/RC)**

Start: **1 October 2019** / End: **30 September 2026 (EC) / 30 September 2034 (RC)**

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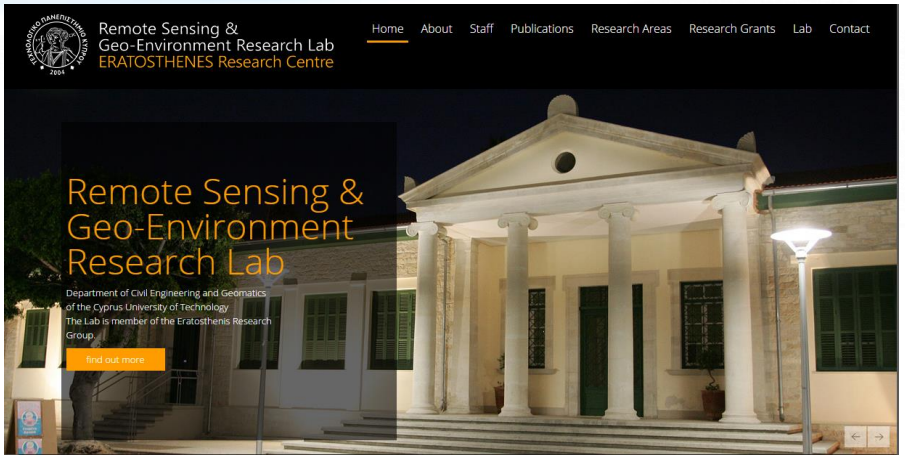
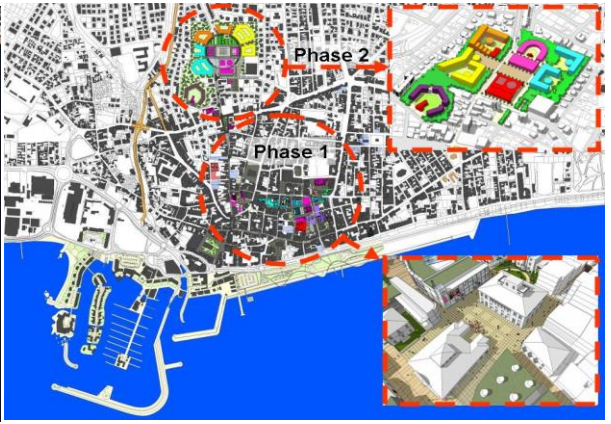
Where?

ECoE is based at the Cyprus University of Technology premises in Limassol (with supporting infrastructures in Coastal Municipalities)






Limassol- Cyprus

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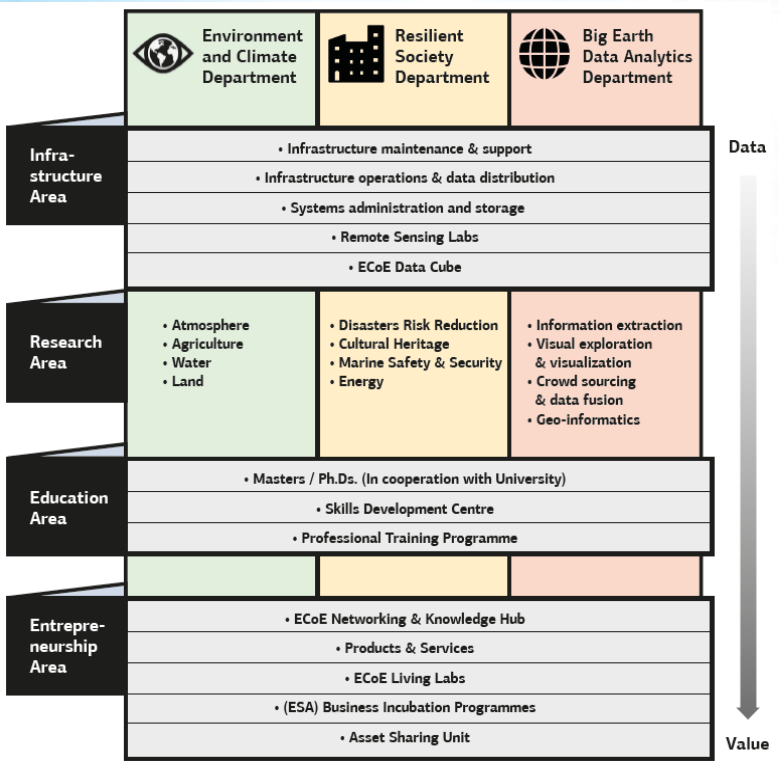
ERATOSTHENES CoE: Digital Innovation Hub



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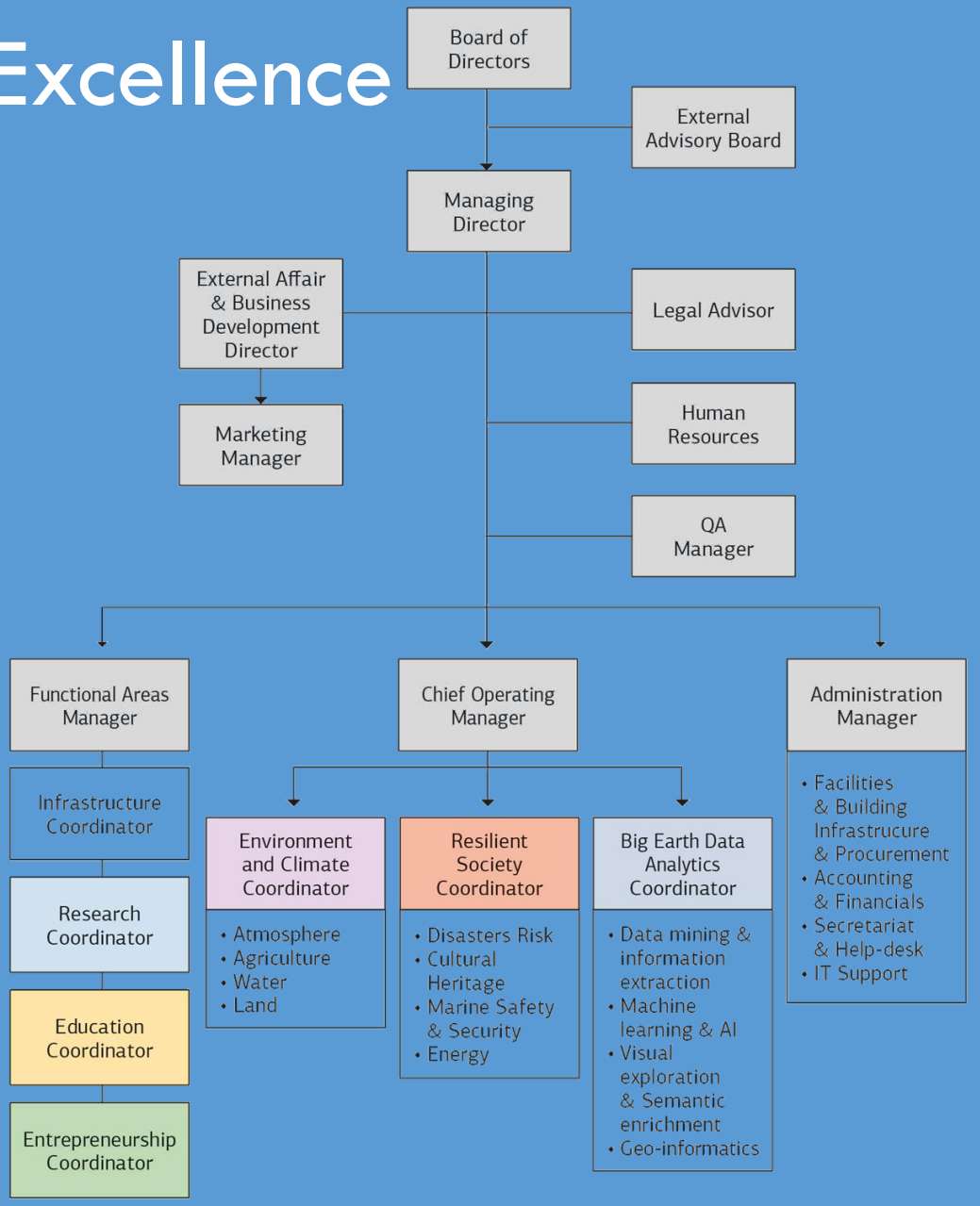
Eratosthenes Centre of Excellence

- Following the 13 years experience in EO and through 'EXCELSIOR'' Teaming, a new legal entity has been established with the following name: **'ERATOSTHENES CENTRE OF EXCELLENCE'** that will guarantee the ECoE's autonomous operation (approved by the CUT board)

- The ECoE has been established as a **Company Limited by Guarantee without Share Capital non-profit limited company**.

- The ECoE is **be completely autonomous in its decision making, as it will be managed by its own Board of Directors (BoD), which will be composed of seven (7) members.**



Board of Directors of the ERATOSTHENES CENTRE OF EXCELLENCE

1. Associate Professor **Evangelos AKYLAS** - Cyprus University of Technology;

2. Mr. **Marios DEMETRIADES** - Managing Director of the MD Mindset Capital Ltd; Former Minister of Communications and Works

3. Mrs **Vasiliki ANASTASIADOU** - Former Minister of Communications and Works;

4. Mrs **Barbara RYAN** - Former Secretariat Director of GEO (Group on Earth Observations);

5. Dr **Rosa LASAPONARA** – CNR, Italy;

6. Dr **Nektarios CHRYSOULAKIS** - Director of Research,
   Foundation for Research and Technology (FORTH), Greece;

7. Mr. **Christos STYLIANIDES** - Former European Commissioner.







Open Innovation

- **Open Innovation is a key driver for the operations of the Eratosthenes CoE**. Based on the European Commission, Open Innovation is an important component of the current European Innovation System, where all societal stakeholders are involved in innovation creation. Open Innovation 2.0 is an approach for innovation focused on solving key European challenges.

- 'Open Innovation 2.0 (OI2) is considered as a new paradigm based **on a Quadruple Helix Model where government, industry, academia and civil participants work together** to co-create the future, and drive structural changes far beyond the scope of what any one organization or person could do alone'.

- Within the new Open Innovation process, there are five key elements:

(1) Networking;

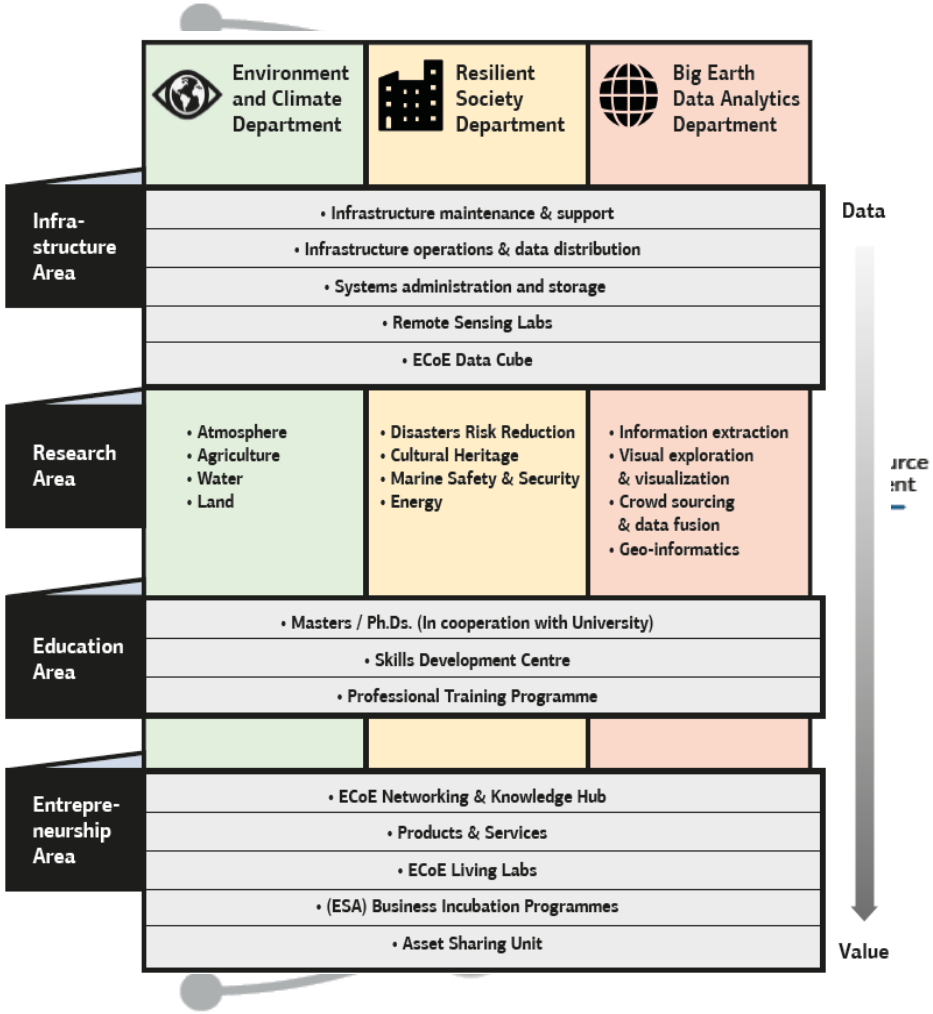
(2) Collaboration: involving partners, competitors, universities, and users;

(3) Corporate Entrepreneurship by enhancing corporate venturing, start-ups and spin-offs;

(4) Proactive Intellectual Property Management by creating new markets for technology and

(5) Research and Development (R&D) which focuses on achieving competitive advantages in the market.

ECoE Vision: Within the next 7 years, the ECoE **will become a world-class Digital Innovation Hub (DIH) for EO and Geospatial Information becoming the reference Centre in the Eastern Mediterranean, Middle East and North Africa (EMMENA)**



- **Research Excellence:** to excel in **five application domains**
- **Sustainability Model**: to deliver **Open Science and Open Innovation** through **Digital Innovation Hub, as a multiplier**
- **Regional Growth** and **Competitive advantages:**
  1. to install and operate **a supersite for aerosol & cloud monitoring** and **a real time EO data receiving station in the EMMENA**
  2. to become a Gateway for facilitating and enabling International cooperation in the EMMENA
- **Impact:** to provide relevant information for **decision making** to science, industry and Governments in order to **support policies** and business development and **improve the quality of life for all citizens** and generate economic growth
- **Autonomy: to be fully autonomous.**
- **Concept:** to adopt **a two axis model**: three thematic clusters **vs** four functional areas

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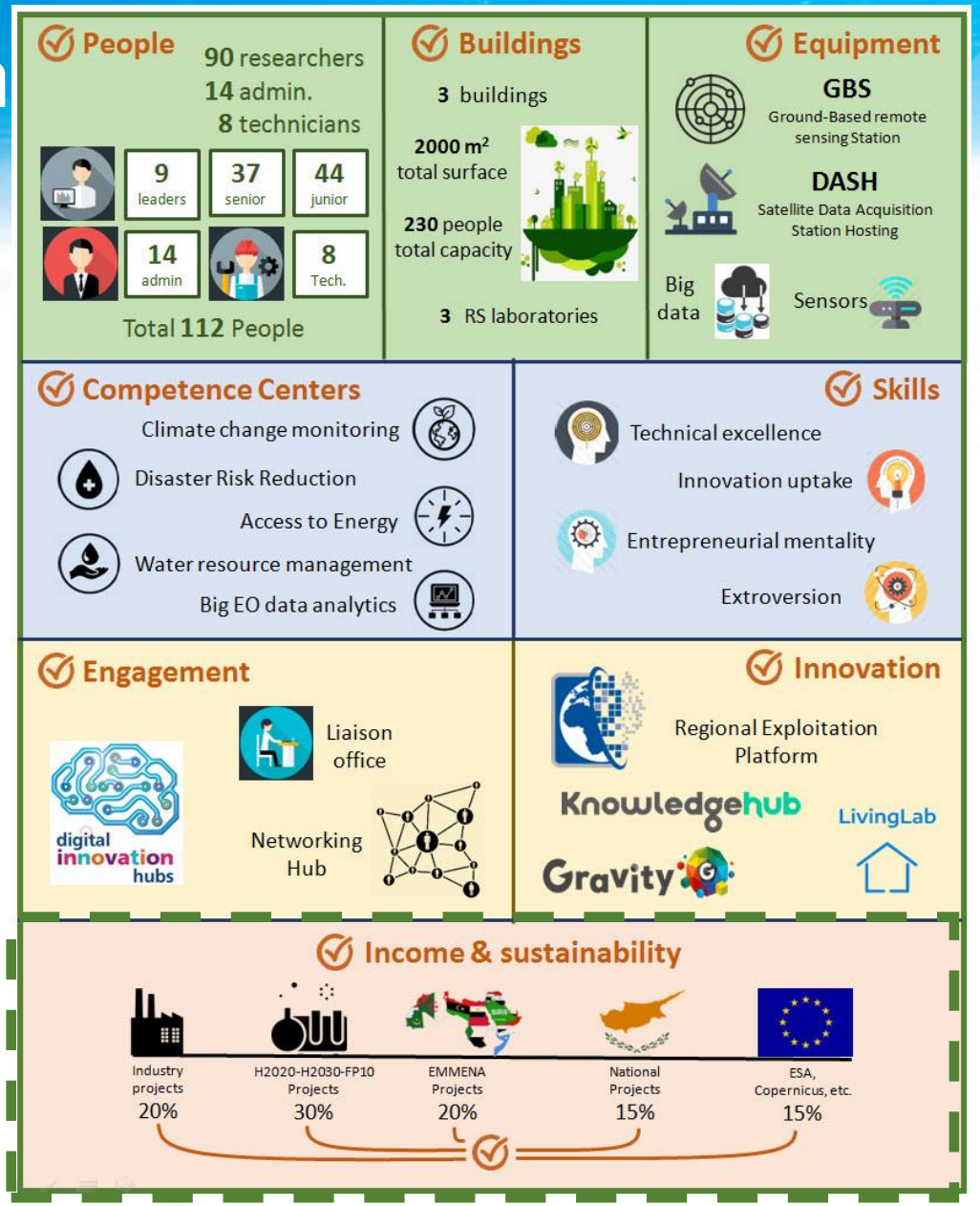
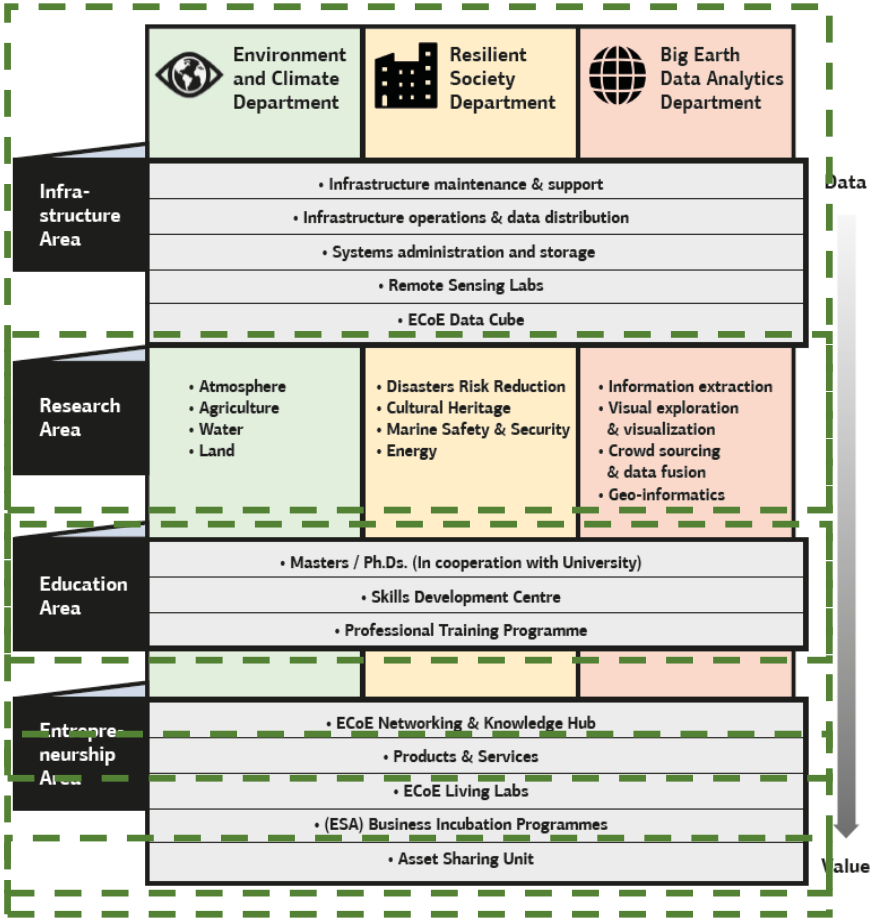
ECoE Implementation

- **Investment**
  - **112 Personnel in 7 years, 132 in 15 years**
  - **2000m² offices and Research Laboratories**
  - **State-of-the-art-Remote Sensing Research Infrastructure**
- **Skills Development**
  - **Technical excellence**
  - **Innovation Uptake**
  - **Entrepreneurial mentality**
- **Achievement**
  - **World class Research, Innovation, Education**
  - **Digital Innovation Hub**
  - **Living Labs Ecosystem**
- **Engagement**
  - **Networking Hub**
  - **Liaison Office**
  - **Regional Exploitation Platform**



Our Strategy: income diversification, open innovation and positioning in EMMENA

1. **Research Competence Centers**
   - based on EXCELSIOR partners profile, enlargement of skilled, mobile, innovative science staff, building unique observational capacities, and establishing international partner network
2. **Digital Innovation Hub** as an **Open Science – Open Innovation** paradigm through **co-exploitation business models** and building upon partnering with stakeholders and markets in EMMENA:
   - Stimulating market-oriented activities, and entrepreneurship
   - Providing state-of-the-art know how
   - Exploiting the IP, tools, and patented solutions developed at ECoE
3. **Uptake User-centric solutions through co-designing and co-creation**
   - Innovative EO-based products & services and applications to addressing priorities of economic & societal sectors such as energy, resilient societies and businesses, water management, climate change, transport, tourism, agriculture
4. **Development unique for the region infrastructure**
   - Satellite Data Receiving Station
   - Labs and measurement systems (CAL/VAL, standardisation)



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Third party funding routes

20% Industry & exploitation of services

- **Services** to the industry using alliances with key partners (CYTA, Cyric, Gravity, SignalGenerix)
- **Leasing infrastructure** to 3rd parties
- **Licensing of IP**
- Entrepreneurship (**spin-offs - royalties**)
- Consulting and digital services **start-ups**

30 % EC projects

- (1) H2020, H2030 (FP10), (2) MED: territorial cohesion and environmental protection, sustainable development. (3) LIFE+ (4) ECHO: Humanitarian Aid & Civil Protection (5) INTERREG EUROPE (6) PRIMA CALLS: from 2018 to 2028

20 % EMMENA projects

- Projects with EMMENA countries through local government and EC&IFIs funding (e.g. ENI, Euro-Mediterranean cooperation , IFIs rehabilitation activities and development projects)
- Privileged access to untapped market opportunities in EMMENA due to: Cyprus location, access to EMMENA EO network and action plans through GEO-CRADLE's market analysis in areas: Food , Energy, Climate Change, Access to Raw materials;

15 % National Projects

- Cyprus Research Promotion Foundation, Structural Funds, Ministry of Commerce , Public/Private sector in support to National Smart Specialisation Strategy in Cyprus

15 % ESA, GEO, Copernicus

- ESA: By 2022, Cyprus will become a full ESA member state, exploiting ESA funds.
- Copernicus cross-cutting & cross sector services (e.g. agriculture, energy)
- GEO, GEOSS and EUROGEOSS opportunities, UN SDGs & Sendai Framework actions

Application areas that attract funds through services:

1. **Energy**
2. **Water resources mgt.**
3. **Marine Safety & Security**
4. **Land applications**
5. **Agriculture**
6. **Geo-informatics**

Detailed Value propositions vs Customers Canvases

"Pains" to be addressed for Maritime Safety & Security

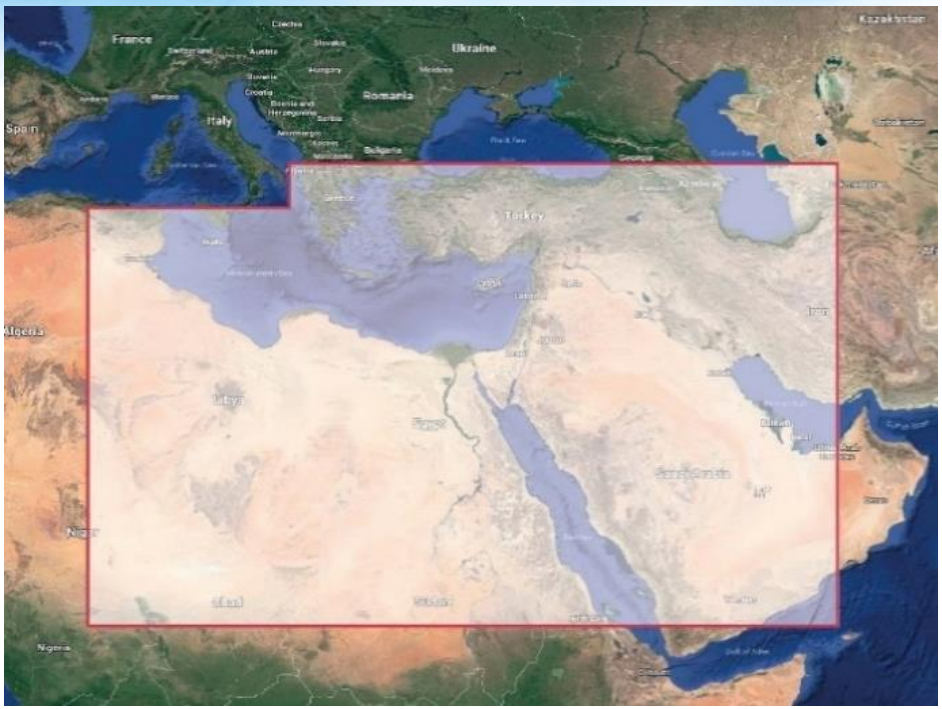
1. How can I get a continuous situation analysis of my off-shore and coastal areas?
2. How can I detect oil slicks and pollution at wide areas
3. How can I trace oil and gas off-shore exploitation areas
4. How can I regularly monitor environmental features ?
5. How can I get this fast and in ready-to-use GIS format?

ECoE Impact

- To provide relevant information

  for **decision making** to:
  - **science,**
  - **industry**
  - **Governments**

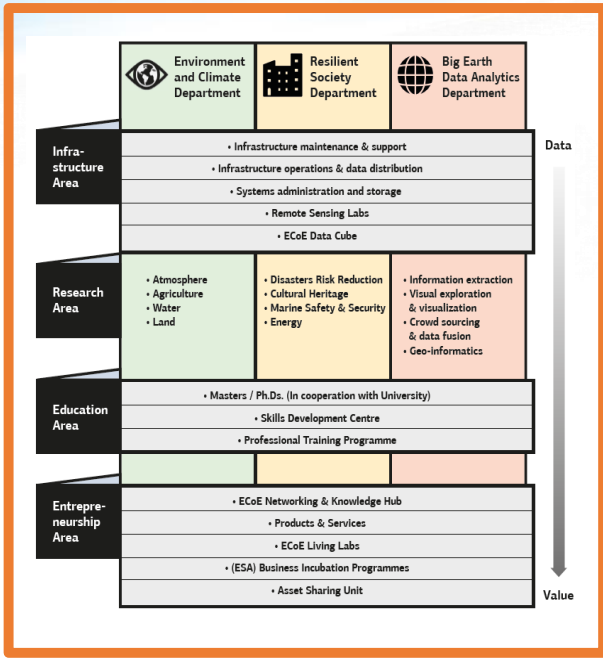
  in order to:
  - **support policies**
  - **business development**
  - **improve the quality of life for all citizens**
  - **generate economic growth**



DIH for earth observation for the ECoE

- One of the main concepts of the ECoE **is to be a fully functional Digital Innovation Hub and a Research Excellence Centre for EO in the EMMENA region.**
- It will create an ecosystem which combines state-of-the-art sensing and data management/processing technologies, cutting - edge research opportunities, targeted education services and promotion for entrepreneurship.
- In order to be a dynamic and innovative DIH, it will be based on two major infrastructures, which are:

1. **a Satellite data direct receiving station**
2. **and a Ground-based atmospheric remote sensing station as well as additional infrastructure**.



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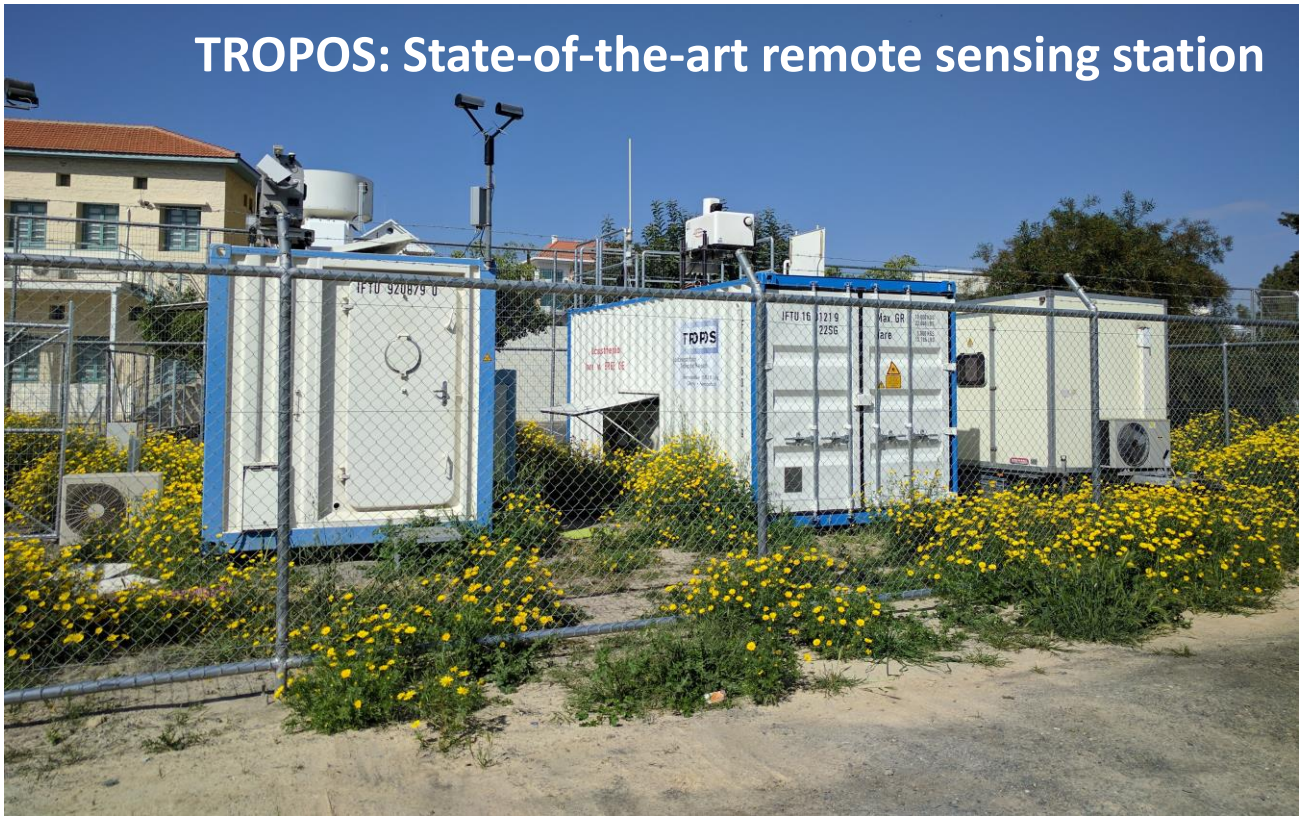
Main Infrastructure and Partners Contribution

NOA: Copernicus Hub, Natural Hazards-related Infrastructure

TROPOS: State-of-the-art remote sensing station



DLR: Receiver Antenna

- The ECoE, in cooperation with DLR, **will establish an EO Satellite Data Acquisition Station (DAS) to be able to directly receive data from EO satellite missions, which will allow Near Real Time (NRL) monitoring and thereby provide time-critical information for science and products within the receiving cone of the station, namely, over the EMMENA region**.

- Cyprus comprises a unique location for this antenna, as it will be located in the farthest South-Eastern location within the European Union, thus providing an extended coverage compared to other European antenna locations, including a wide range of data from Eastern Europe, Northern Africa and the Middle East.

- The ECoE, in cooperation with TROPOS, will establish a ground-based atmospheric remote sensing station (GBS) by consolidating all necessary infrastructure to set up a supersite for calibration/ validation, aerosol and cloud monitoring.
- **The establishment of the GBS is a vital aspect of DIH, as the EMMENA region is a unique area where anthropogenic pollution, desert dust and clouds mix**. To date, there have not been any integrated, cohesive studies regarding the atmospheric activities in the EMMENA region, whose results can be used to provide essential information to stakeholders and decision-makers.

Limassol, Cyprus [34.7°N, 33°E]
ideal natural laboratory
for advanced and comprehensive
field studies of
climate change,
aerosol-cloud-dynamics-precipitation interaction,
weather-precipitation-dryness complex,
representative for
typical Mediterranean and even Middle East
meteorological conditions and for coastal areas in
the EMMENA region

Ground Based super site for atmospheric profiling

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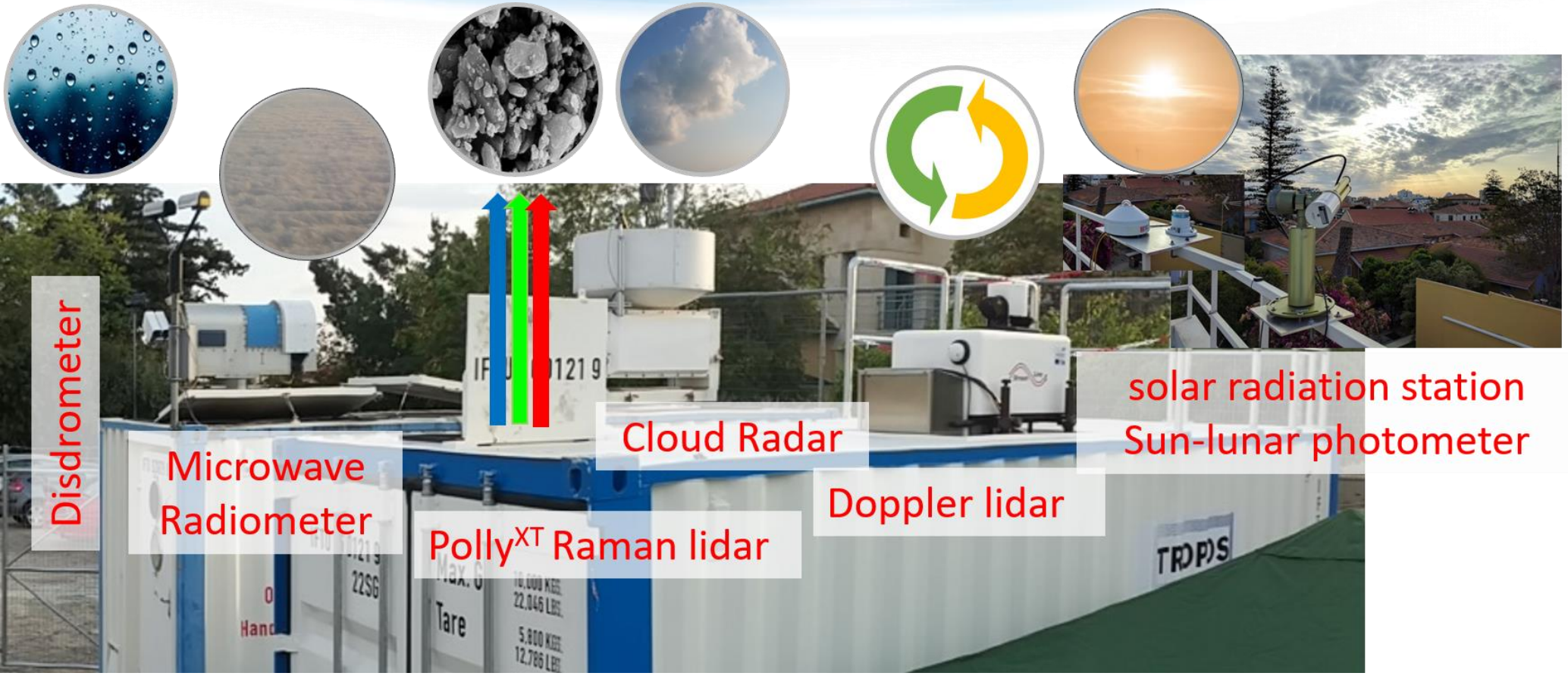

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- The ERATOSTHENES Centre of Excellence (ECoE) adopts a two-axis model. **The vertical axis consists of three Thematic Clusters** and **the horizontal axis consists of four Functional Areas.**

- In line with the ECoE Vision, **the three Thematic Clusters** are defined for sustained excellence in the areas of **infrastructure, research, education and entrepreneurship** in the **thematic clusters of Environment and Climate, Resilient Societies and Big Earth Data Management.**

Multi-actor approach

The ECoE engages with the complete ecosystem of stakeholders in **a Multi-Actor approach**, **linking actors segmented according to their geographic location** (from central Europe, to South-Eastern Europe, to EMMENA region), **their position in the EO value chain** (from EO data providers, to science laboratories and research institutes, to SMEs and large industries) and **their mandate** (from Public Sector, to sectorial coordination organizations, to economic development banks, etc.).

- The ECoE will exploit the networks of which the EXCELSIOR partners are members to **facilitate capacity building, knowledge transfer, research partnerships**, etc.

- **The Infrastructure Area** will be responsible for the seamless use of the existing and future ECoE infrastructure, their proper operations and **the available access to EO data by the ECoE staff and stakeholders.**

- **The Research Area** will be responsible for the **development of open-access science and research which will lead into the development of ECoE services**.

- **The Education Area** will sustain the development and operation of the ECoE as a **Regional Digital Innovation Hub**. The specific activities of the Education area include the **MSc & PhD-hosting programme in EO, a Skills Development Centre and a Professional Training Programme**.

- **The Entrepreneurship** Area will be responsible for ensuring the sustainability of the ECoE and stimulating national and regional growth, through the exploitation of the **IPR, licensing of innovation and market uptake of new EO-based products, services and solutions generated by the ECoE and the Strategic Partners.**

Multi-actor characteristics

The ECoE as a Digital Innovation Hub employs the following distinct Multi-Actor characteristics:

- **ECoE Skills Development Centre**
- **Professional Training Programme**
- **Networking and Knowledge Hubs**
- **Regional Exploitation Platform**
- **Living Labs and Business Incubation Programme**

ECoE Skills Development Centre

- The objective of the Skills Development Centre is to invest in **the continuous technical and scientific development** of the ECoE staff and to create the next generation of researchers, scientists and engineers that will sustain the ECoE operations.
- **Accredited technical short courses, targeting both the ECoE staff and external stakeholders will be given**.
- **The courses will cover critical scientific activities, such as the use of state-of-the-art EO equipment, theory and practice of physical processes modeling and EO data assimilation, novel remote sensing techniques, machine learning theory and practice, and big data management.**
- Synergies with the **Copernicus Academy** (CUT and the consortium partners are members) training events will be pursued.

Copernicus Academy

Professional Training Programme

- **A dedicated programme for the professional development of ECoE's stakeholders in the region will focus on equipping and facilitating scientific and research personnel in the field of Earth Observation to make the leap and bridge the gap from science to commercialization of EO-based products and services.**
- The programme **will act as a regional multiplier in the EMMENA, educating the new generation of scientists and motivating them to create new business capitalizing on innovative research**. In addition to the ECoE staff, governmental departments, private companies and end-users can benefit from the EO professional training schemes.

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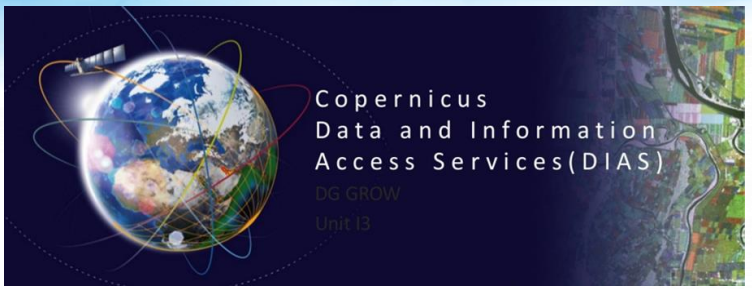
Networking and Knowledge Hub

ECoE aspires to set-up a Hub to allow the agglomeration of both the stakeholders and the relevant knowledge, acting as a regional Focal Point in EMMENA:

- **ECoE will exploit the GEO-CRADLE network in EMMENA, and expand it with well-established networks that the ERC is a part of, such as GEO, NASA, EARSeL, ISPRS, DLR, TROPOS, ATHENA, Earlinet, ACTRIS, AERONET, etc**. A **Networking platform** will be set up to support the ECoE Networking Hub, which is central for implementing the Multi-Actor approach.
- **The ECoE builds also the ECoE Knowledge Hub as a one stop shop**. The Hub will include training material, **portfolio of best practice examples and lessons learnt for the different ECoE relevant applications etc.**

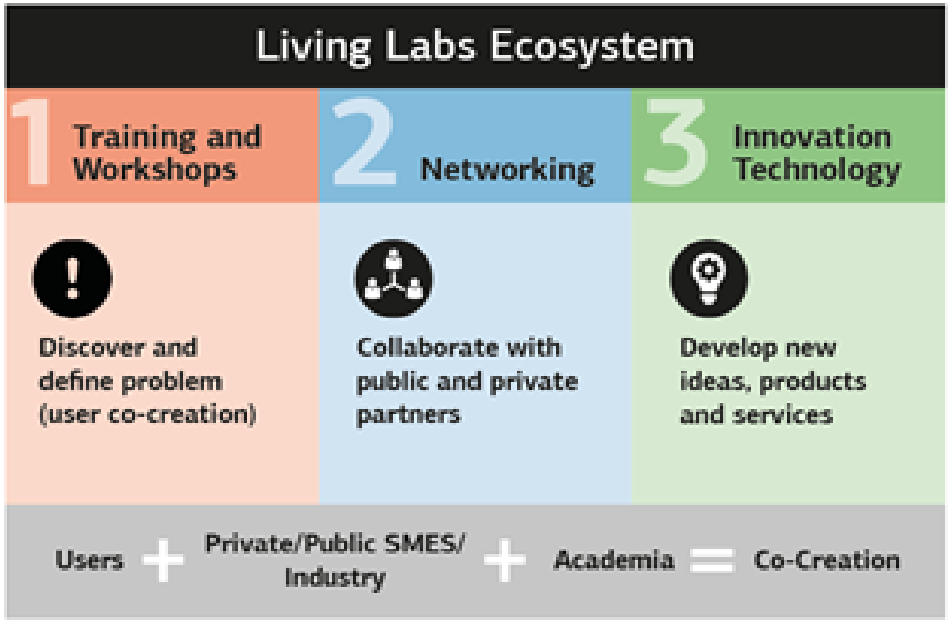
Exploitation Platform

- The aim of the Exploitation Platforms **is to facilitate the end-user's access to data and tools**.
- **ECoE's Regional Exploitation Platform will provide its stakeholders with access to the ECoE Data Cube and the tools, processors and ICT resources and the interfaces required to work with them. The platform will be deployed on one of the Copernicus DIAS providers, for accessing scalable cloud computing and storage resources.**



Living Labs

- The **ECoE Living Labs**, **which will be the Focal Point where academics, researchers, industry members, policy makers and end-users can come together, to generate and validate ideas.**



Incubator

CyRIC

- The **(ESA) Business Incubator Programmes. The ECoE will be a key partner with launching the European Space Agency Business Incubator Centers (ESA BIC) in the Eastern Mediterranean. The centre will design incubation programmes tailored to the ECoE EO thematic fields. The programmes will be deployed in CyRIC's Incubator (based in Cyprus) programme Gravity through a strategic partnership.**
- The ECoE BIC programmes will include, training on product development and IPR, access to ECoE and ESA IP for Commercialization, technical Support, access to the international ESA BIC community and international ESA events, the organization of business appointments in EMMENA, and access to national and regional contacts

Gravity

https://www.cyric.eu/cyric-incubator/

Excellence in Research

- The ECoE advocates that the Centre will be a European focal point for cutting edge Earth Observation research in five main application domains. These application domains, that were identified through a market and gap analysis for the EMMENA region

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Quadruple Helix Innovation Model

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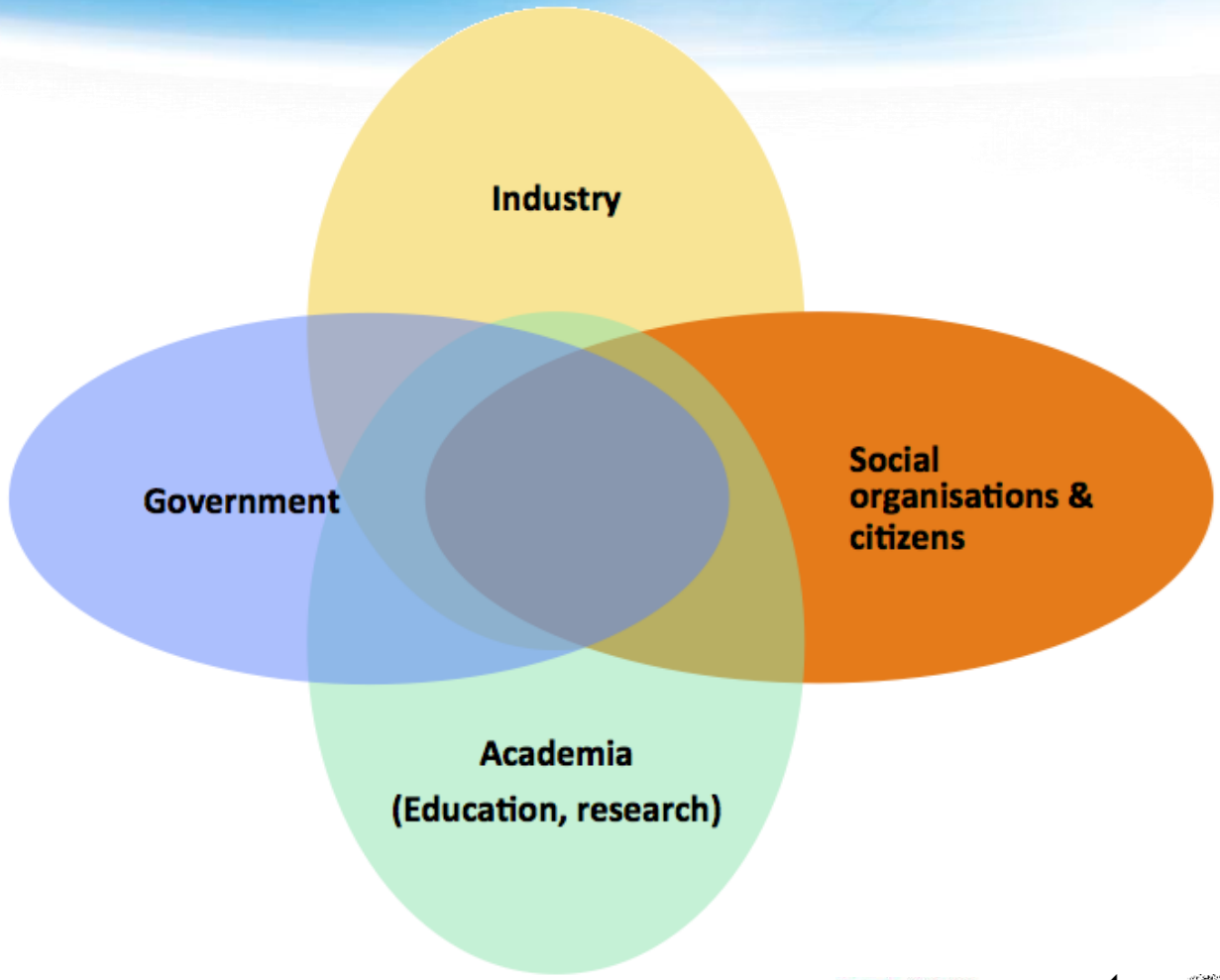
Quadruple Helix Innovation Model



Existing ERATOSTHENES Stakeholder Hub

>500 members: Universities & Research Centers from Europe and International

Cyprus University of Technology

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Commitments: Sponsors and Supporters for EXCELSIOR Teaming

from academia, industry, government, society

>95 organizations, research centres, universities, networks

19 Cy Govermental Departments, municipalities

Republic of Cyprus

National Support and Commitment from 19 Governmental Departments

- **Government of Cyprus (through 15 million euros)**
- **President of the House of Representatives,**
- **Minister of Finance**
- **Minister of Transport, Communications and Works,**
- **Minister of Education and Culture,**
- **Minister of Foreign Affairs**
- **Deputy Minister of Shipping**
- **Commissioner of the Environment**
- **Commissioner of Agricultural Payments**
- **Cyprus Investment Promotion Agency**

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National Support and Commitment from 19 Governmental Departments

- Department of Lands & Surveys
- Geological Survey Department
- Agricultural Research Institute
- Department of Public Works
- Department of Forests
- Department of Fisheries and Marine Research
- CYPRUS DEPARTMENT OF METEOROLOGY
- Department of Water Development
- ρυθμιστική αρχή ενέργειας κύπρου cyprus energy regulatory authority
- Department of Labour Inspection – Air Quality Unit
- Department of Civil Defence
- Department of Antiquities
- Cyprus Agricultural Payments Organization
- Agricultural Research Institute
- DEPARTMENT OF ENVIRONMENT
- Invest Cyprus – Cyprus Investment Promotion Agency
- Cyprus Port Authority
- CYPRUS TOURISM ORGANISATION www.visitcyprus.com
- Department of Urban Planning

Cyprus University of Technology · DLR · TROPOS Leibniz Institute for Tropospheric Research · DEC

National Support

- **CYTA, the national telecommunication authority,** provided also a significant **commitment** for **hosting** the **ground satellite receiving antenna** in their land for **15years** (10,000 sq.m land with LoC of **200K€**).

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Cyprus Industry

SignalGeneriX Advanced Signal Solutions

netU

25 YEARS ATLANTIS CONSULTING

CyRIC

GraVity

Island Oil Holdings

NOVATEX SOLUTIONS.EU

GEOFEM GEOTECHNICAL ANALYSIS

CYPRUS CHAMBER OF COMMERCE AND INDUSTRY

hellassat

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International Support

NASA

esa

ISA Israel Space Agency סוכנות החלל הישראלית

AIRBUS DEFENCE & SPACE

HEXAGON

EARSeL

GEO

isprs

FAB SPACE 2.0

EARSC European Association of Remote Sensing Companies

nereus network of european regions using space technologies

ACTRiS

EARLINET

Copernicus Academy

TUM

FORTH Foundation for Research & Technology - Hellas

ARISTOTLE UNIVERSITY OF THESSALONIKI

National Technical University of Athens

UCL

The University Of Sheffield.

ZHEJIANG UNIVERSITY

TEL AVIV UNIVERSITY

Ben-Gurion University of the Negev

Cyprus University of Technology

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Joining forces .....

- Eratosthenes Centre of Excellence (Cyprus) is **open for collaboration with other universities, research centres and industrial partners!**
- **Looking forward to submit together future proposals.**
- **Looking forward to host and attract researchers from other countries**
- **Looking forward to host ERC, Marie Curie researchers!**
- **Follow our social media and posts for the job vacancies! https://excelsior2020.eu/open-positions/**

erc European Research Council

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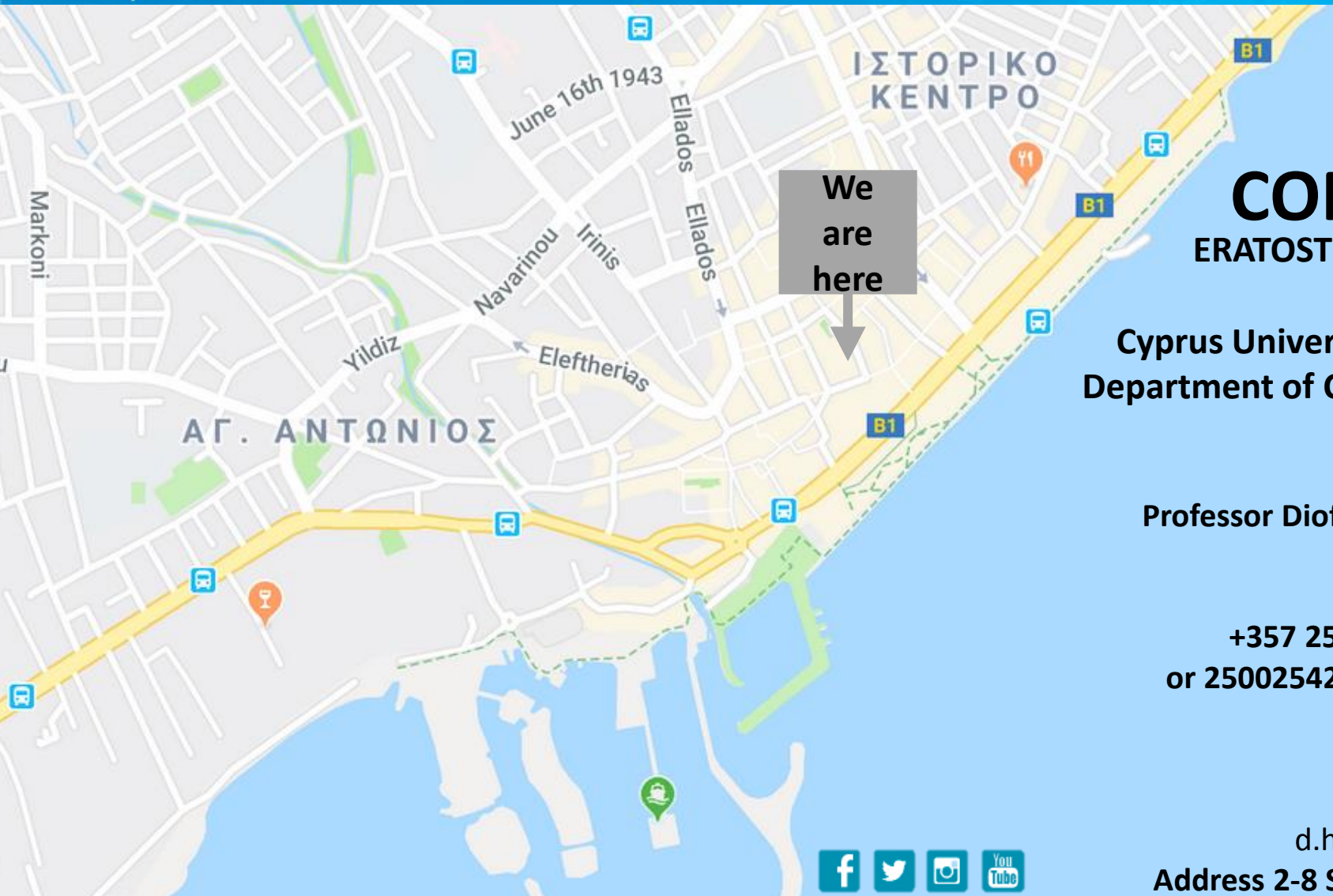

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Project acronym:	**EXCELSIOR**

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