‘EXCELSIOR H2020 TEAMING PROJECT

Diofantos Hadjimitsis

Coordinator of the Excelsior H2020 Teaming project

Eratosthenes CoE, Cyprus-Managing Director

Cyprus University of Technology-Professor

Chania-Greece 18th of July 2024

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Cyprus University of Technology · DLR · TROPOS · DEC · ERATOSTHENES CENTRE OF EXCELLENCE

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Who we are?

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www.cut.ac.cy Cyprus University of Technology, 2007 (2003 by law)

www.excelsior2020.eu EXCELSIOR H2020 Teaming Project (2019): Project

www.eratosthenes.org.cy ERATOSTHENES CoE (2020): New Entity

Credit: Copernicus Sentinel data (2015)/ESA

Overview of the Centre

- A new, autonomous Centre of Excellence, namely ERATOSTHENES Centre of Excellence (www.eratosthenes.org.cy), of the Cyprus University of Technology (CUT) has been established through the EXCELSIOR H2020 Widespread Teaming Phase 2 project (Grant Agreement No. 857510) (www.excelsior2020.eu), by upgrading the existing Remote Sensing and Geo-Environment Lab that has been operating at CUT since 2007.

Remote Sensing & Geo-Environment Lab
Department of Civil Eng. & Geomatics
2007

ERATOSTHENES
Research Centre
2017

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Our History 2007-2020

- In 2007,, **the 'Remote Sensing & Geo – Environment Lab', 'Geodesy Lab', 'Geospatial Analysis Lab' (Eratosthenes Research Center - ERC)** were established within the Department of Civil Engineering and Geomatics with a research focus in: **Earth Observation, Remote Sensing and Geoinformatics**.
- In 2016 **,** the first stage proposal was submitted and EXCELSIOR phase 1 proposal was granted
- In 2017-2018 phase 1 was implemented (ranked first) and on August 2018 business plan was submitted.
- In November 2018 the proposal (phase2) with the acronym 'EXCELSIOR' under the H2020 WIDESPREAD TEAMING was submitted.
- In 2019, the proposal (phase2) with the acronym **'EXCELSIOR'** under the H2020 WIDESPREAD TEAMING was successful and the funding was **granted**!
- In 2020, ERATOSTHENES CoE was established and became a legal entity through Excelsior.
- In 2021/2022, ERATOSTHENES CoE and two affiliated entities joined the consortium after contract amendment (with backdated implementation on October 2021)

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What is Excelsior

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Work Programme Part: Spreading Excellence and Widening Participation, Topic: Teaming

Teaming supports:

- New Centres of Excellence or upgrading existing ones in low R&I performing countries
- Partnerships between leading scientific institutions and partner institutions in low R&I performing countries.

Horizon 2020 Programme

‘Excelsior’ is H2020 Teaming Project under the Spreading Excellence and Widening , Teaming Call! Tool to upgrade our lab at the Cyprus University of Technology!

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EXCELSIOR – Upgrade RS Lab at CUT to ERATOSTHENES Centre of Excellence

- **Funded under H2020 & Republic of Cyprus**
- **Pillar:** Spreading Excellence and Widening Participation
- **Work Programme Year:** H2020-2018-2020
- **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:** >38,000,000 € (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)

For more information visit: https://excelsior2020.eu/ and https://eratosthenes.org.cy/

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The idea behind EXCELSIOR

- **Our mission:**

  To **upgrade the existing Remote Sensing & Geo-Environment Lab (ERATOSTHENES Research Centre)**, 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).**

- **Our vision:**

  The ERATOSTHENES CoE, becomes a **world-class Digital Innovation Hub (DIH) for EO and Geospatial Information** and develops into the **reference Centre in the Eastern Mediterranean, Middle East and North Africa Region (EMMENA)**.

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EXCELSIOR Consortium

Affiliated partners

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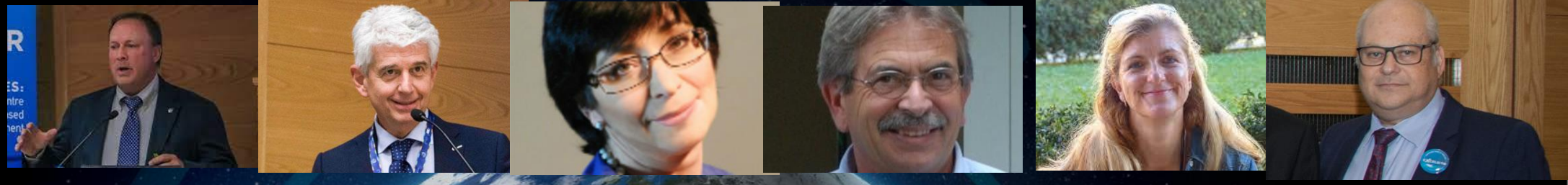

EXCELSIOR
Team: Advisory board

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. Bianca Hoersch (F)	Chief Digital Officer	ESA Headquarters
Mr. Daniel Barok (M)	Senior Space Consultant	Independent consultant (**Israel**)

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Board of Directors: Rosa Lasaponara

Advisory Board: Vincent Ambrosia

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Public inauguration of the Excelsior H2020 teaming Project / November 2019 at the Cyprus University of Technology Premises

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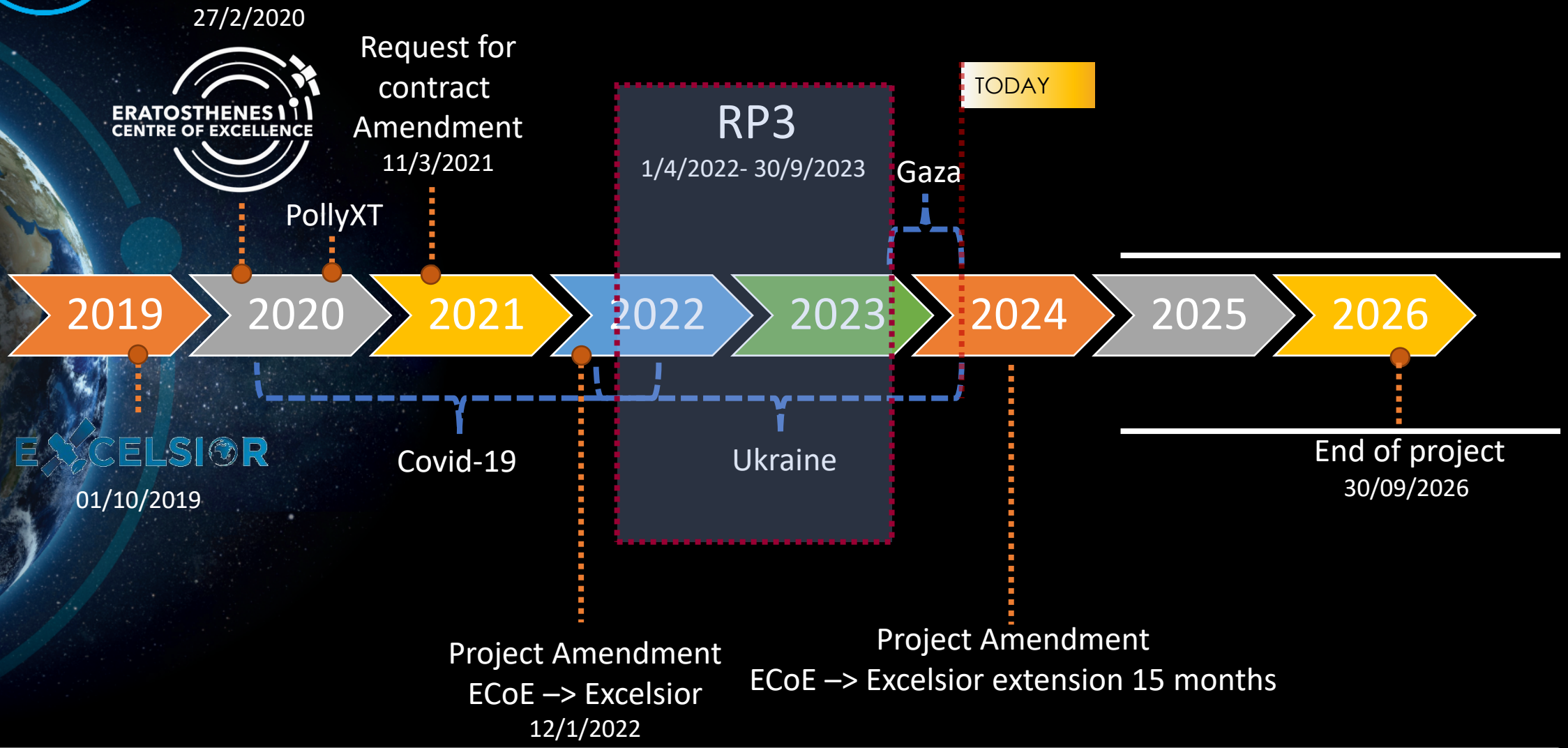

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Why this Consortium?

- **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 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 at the national level
- **CyRIC** will contribute mainly on the establishment of the ECoE's **Digital Innovation Hub** in EMMENA; thus, CyRIC will provide support to the ECoE to develop Entrepreneurial services, a **business incubator** and Living Labs.
- **PMOD-WRC** will contribute to the successful outcome of the **solar energy related objectives** in EXCELSIOR

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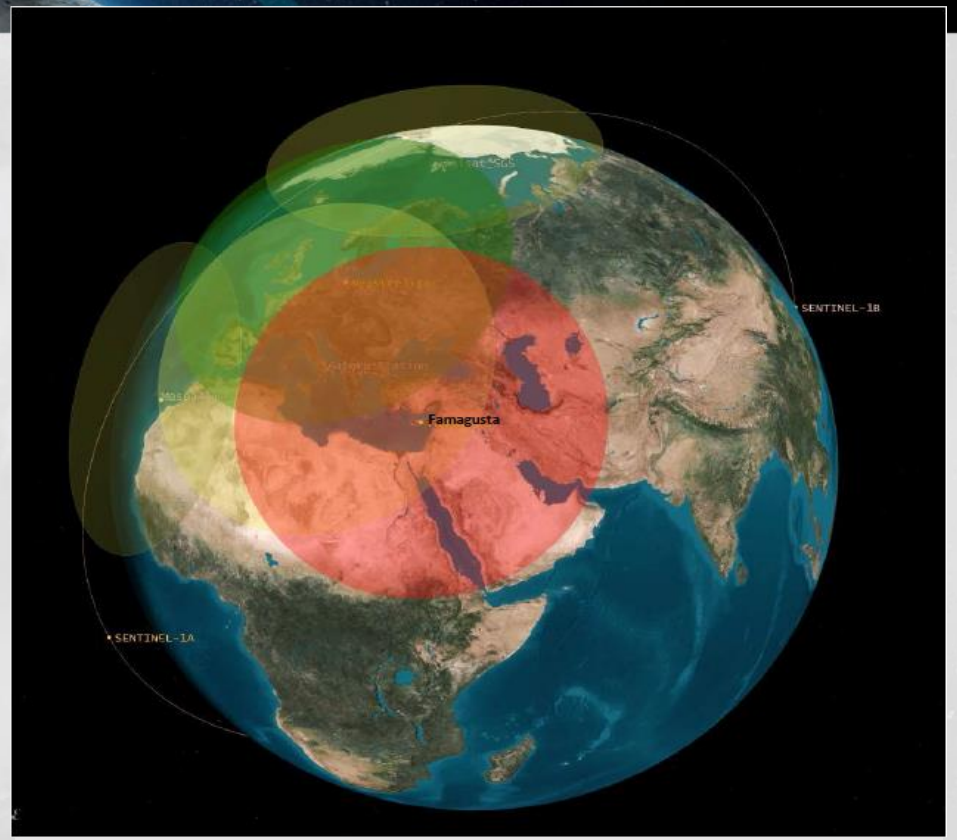
The Location of Cyprus?

Cyprus lies next to the triple junction of three lithospheric plates; the African, Arabian and Anatolian plates.

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



Example of the anticipated visibility circle of a satellite receiving station in Cyprus (red), compared to other European stations.

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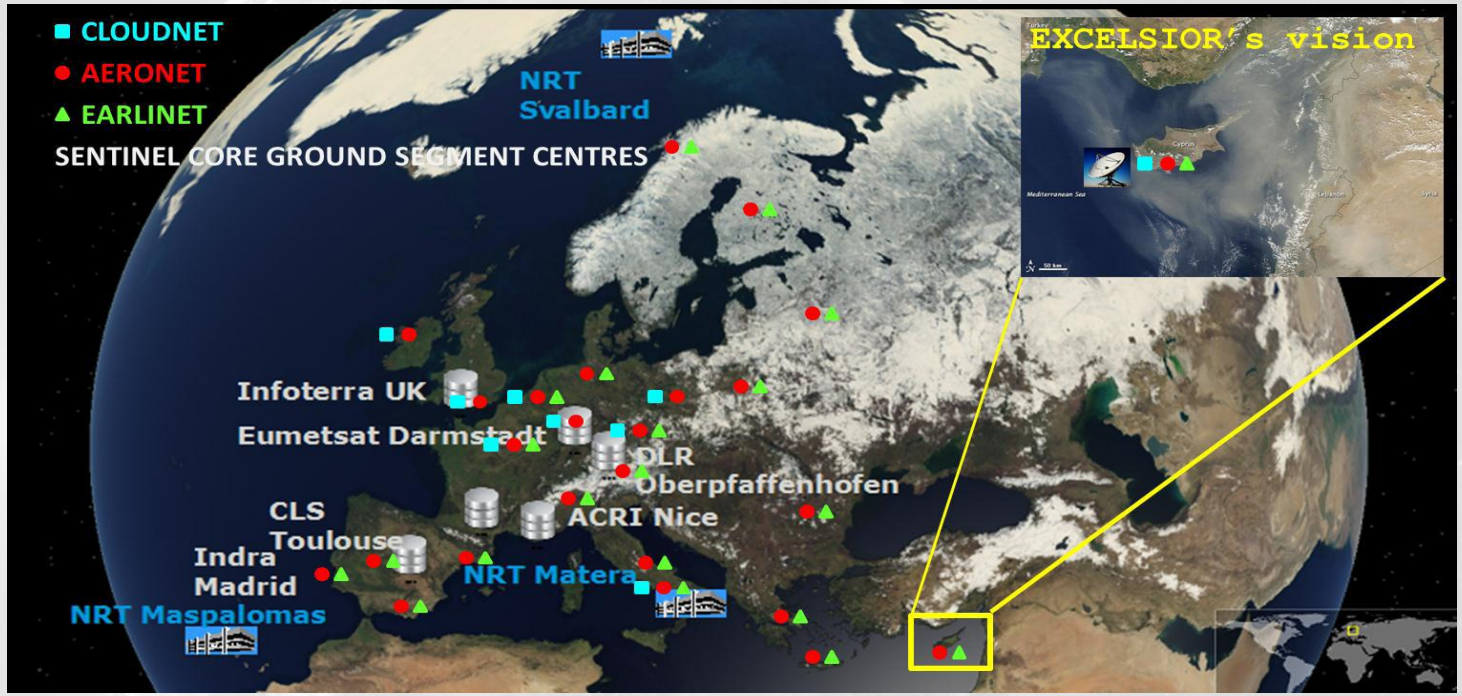
Why EO in Cyprus?

Cyprus's **unique geostrategic position** can support Earth Observation from satellite 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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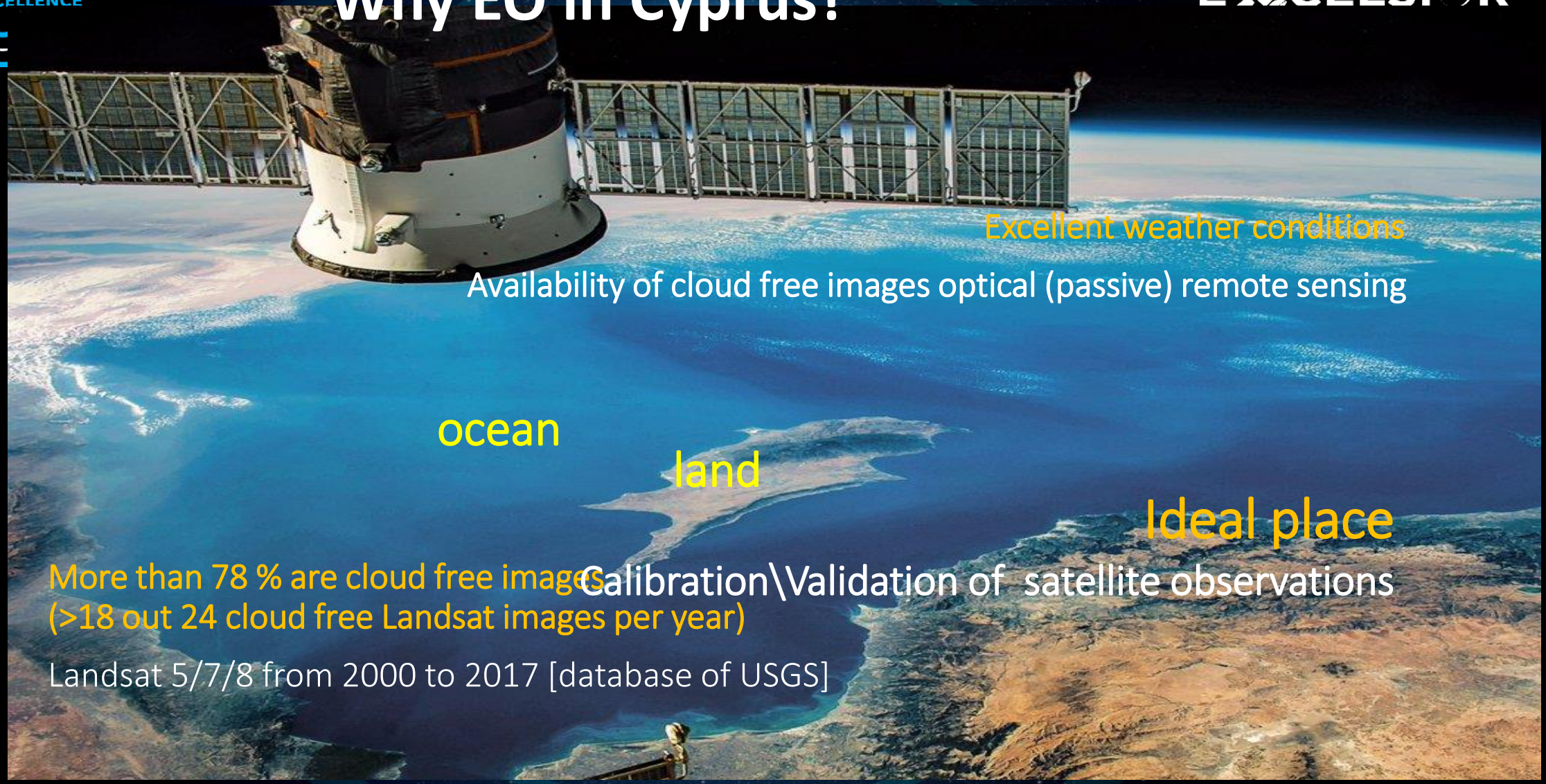
Why EO in Cyprus?



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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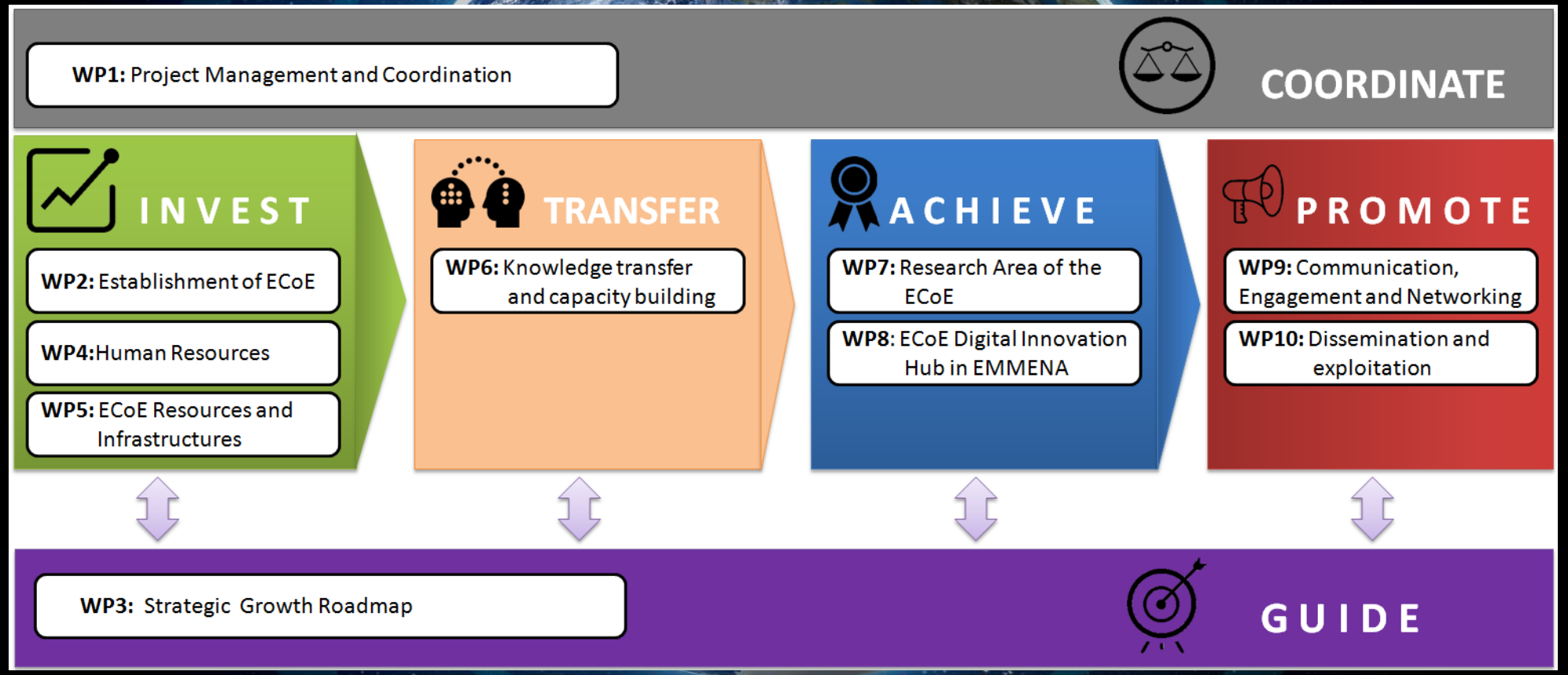
Project Methodology



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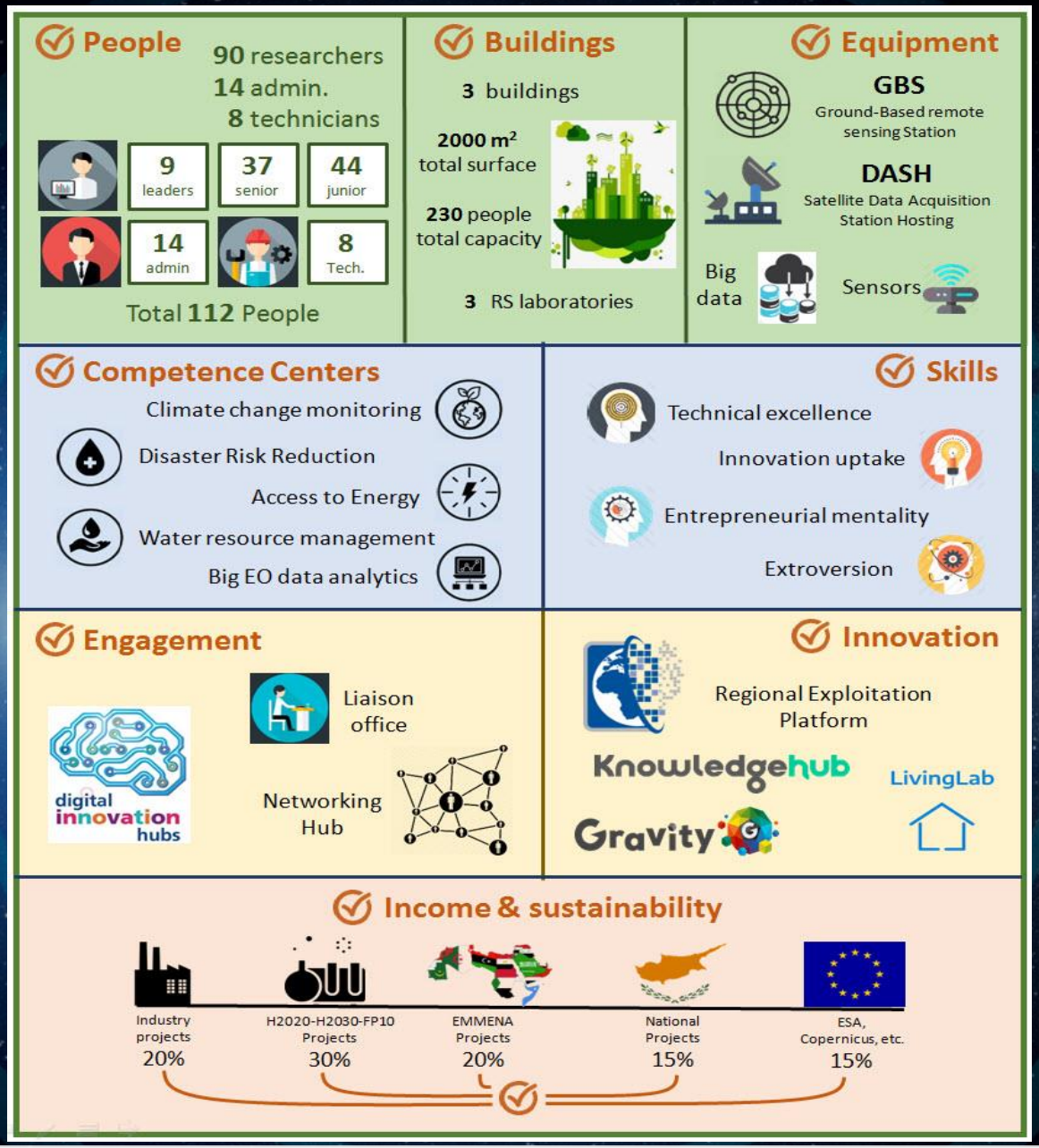
Excelsior Implementation



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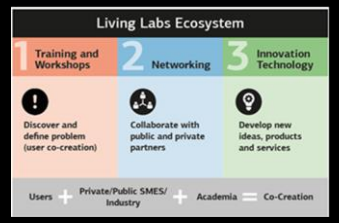
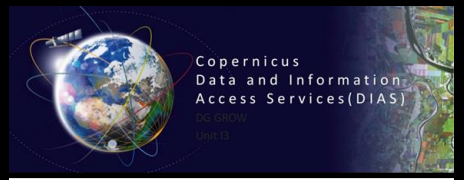
Multi-actor approach

The ECoE as a Digital Innovation Hub provides the following distinct Multi-Actor features:

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





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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)**

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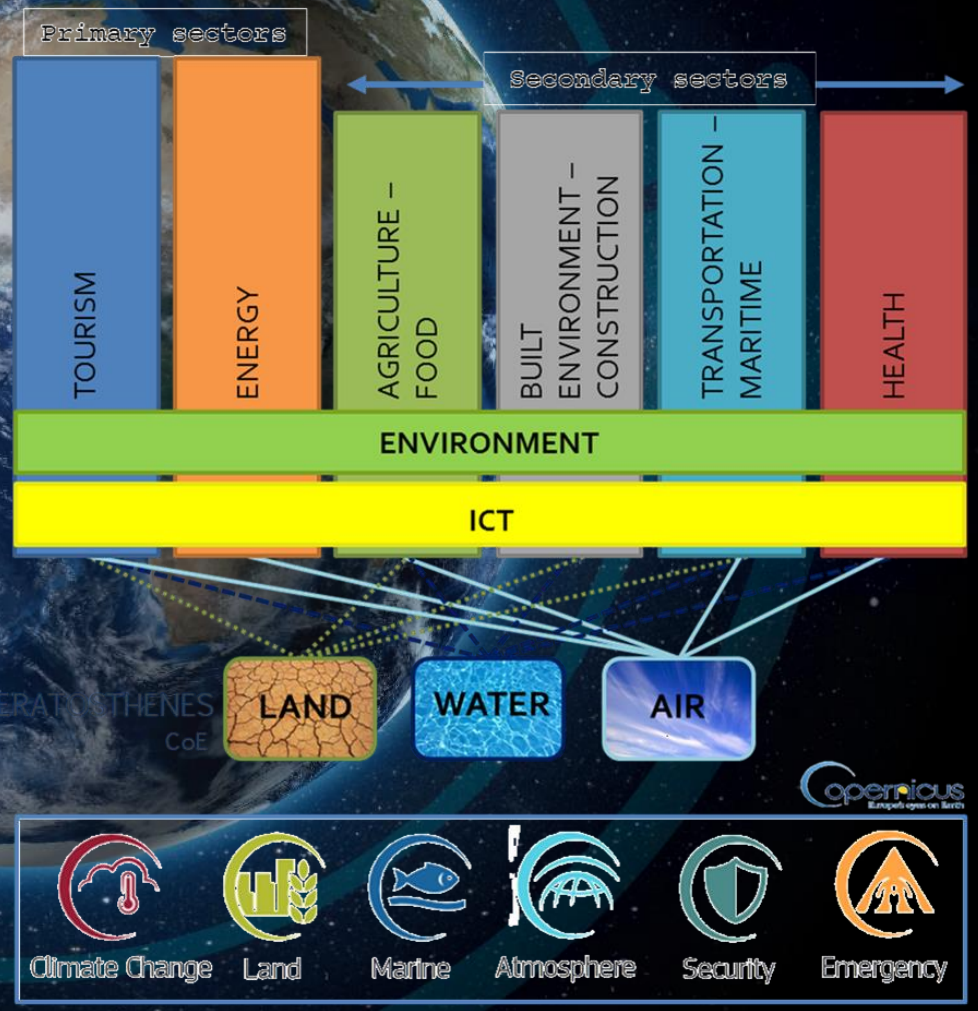
SMART SPECIALIZATION STRATEGY OF CYPRUS

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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Question during interview: Are you committed to the KPIS?
Answer: YES. 100 %

- Transparency
- Teamwork
- Trust

- Consent
- Dedication

We are determined to implement the ECoE through Trust, Transparency and Teamwork Consent, Dedication

... the journey has just begun!

Limassol and Cyprus will be on the map of Space Technology!

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BUSINESS PLAN

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

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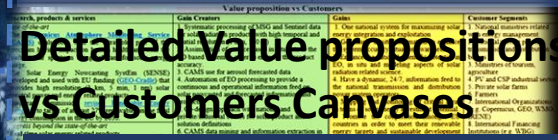
Third party funding routes

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?

ERATOSTHENES CoE

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ERATOSTHENES CENTRE OF EXCELLENCE

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The ERATOSTHENES CoE consists of three Departments:

- **Environment and Climate**
  - Atmosphere
  - Agriculture
  - Water
  - Land
- **Resilient Society**
  - Disaster Risk Reduction
  - Cultural Heritage
  - Access to Energy
  - Marine Safety and Security
- **Big Earth Data Analytics**
  - Information extraction
  - Visual exploration & visualization
  - Crowdsourcing & data fusion
  - Geoinformatics

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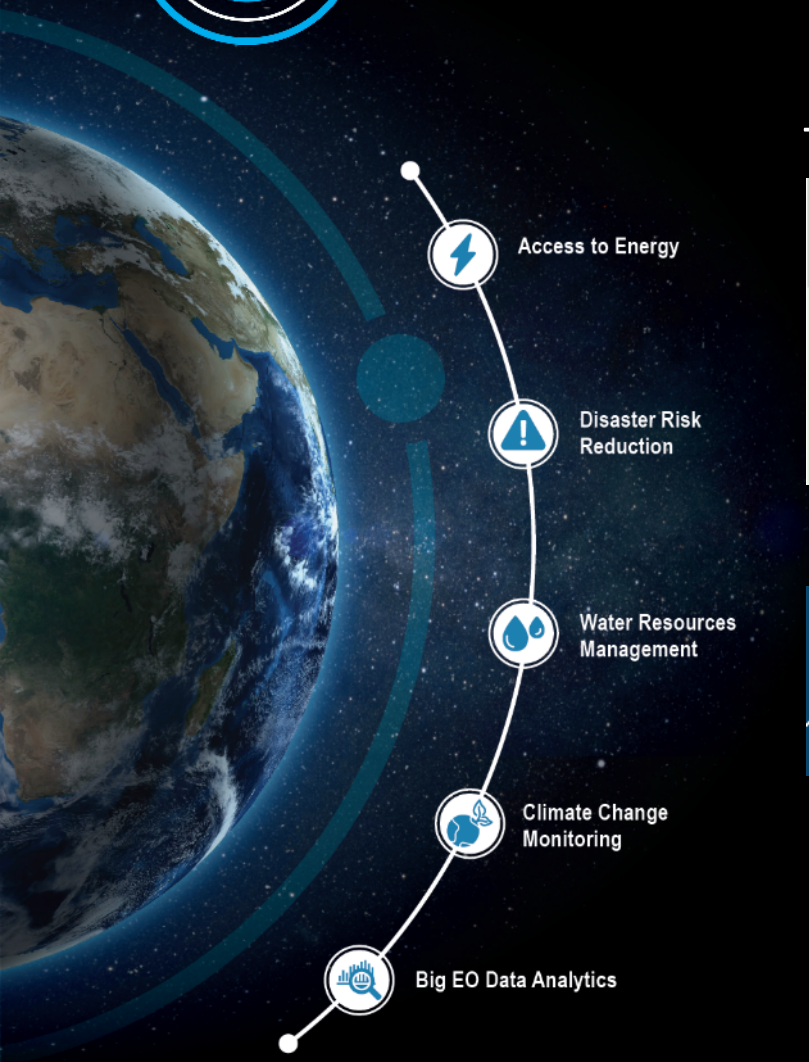
Digital Innovation Hub



Thematic Clusters

Environment and Climate	Resilient Society	Big Earth Data Analytics
• Atmosphere • Agriculture • Water • Land	• Disasters Risk Reduction • Cultural Heritage • Marine Safety & Security • Energy	• Information extraction • Visual exploration & visualization • Crowd sourcing & data fusion • Geo-informatics

Added Value Functional Areas

Infrastructure	Research	Education	Entrepreneurship
• Infrastructure maintenance & support • Infrastructure integration (operations & data distribution) • Systems administration and storage	• Environment and Climate • Resilient Society • Big Earth Data Analytics	• Joint MSc - PhD • Professional Training Programme • Skills Development Centre	• Networking Hub • Space Cluster & Innovation Hub • Incubator Programme • Asset Sharing Unit

Create and strengthen the community of successful space related startups

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Cyprus University of Technology · DLR · TROPOS · DEC · ERATOSTHENES CENTRE OF EXCELLENCE
AFFILIATED ENTITIES
CYRIC · pmod wrc

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Cyprus University of Technology

This project is co-funded by the Cyprus University of Technology.

Headquarters in Limassol: Near the Port

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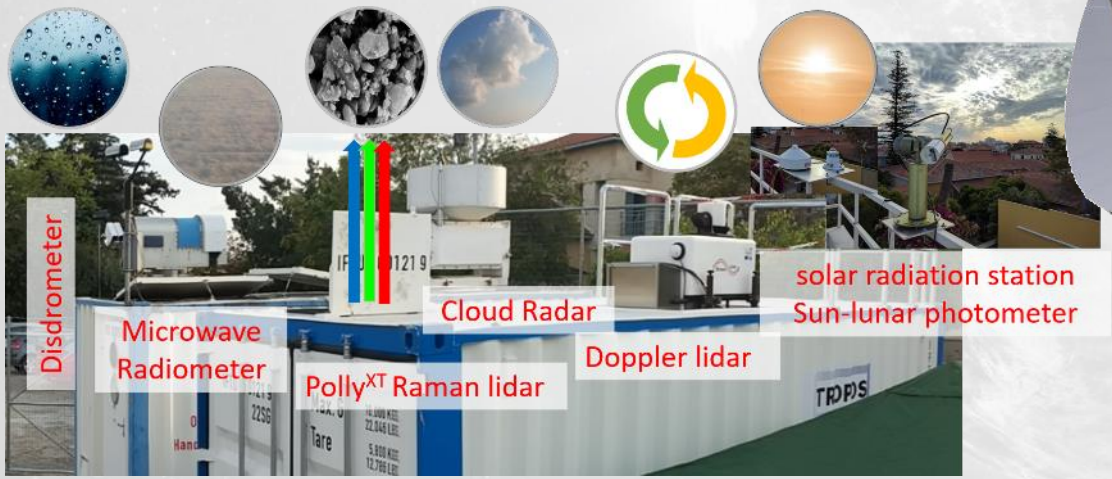
New Premises 3.5. million euros

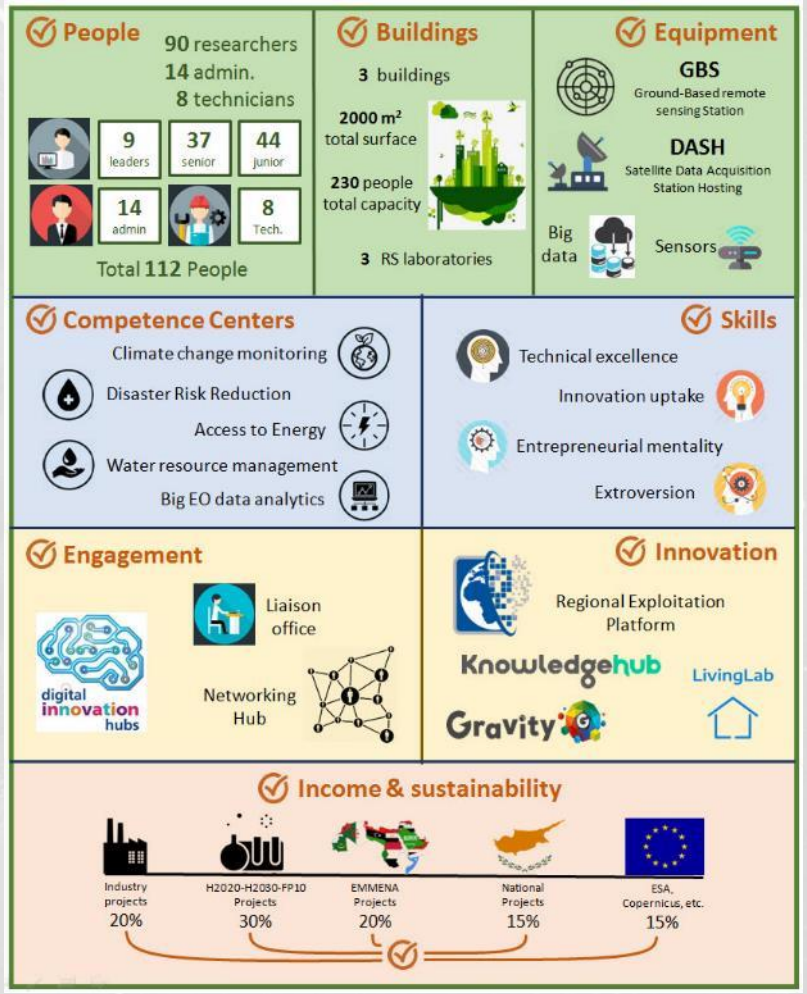
Investment

- **112** Personnel **in 7 years**, **132 in 15 years**
- **2000m²** Offices and Research Laboratories
- **State-of-the-art-Remote Sensing Research Infrastructure**



Ground based station (GBS)

Data Acquisition Station (DAS)



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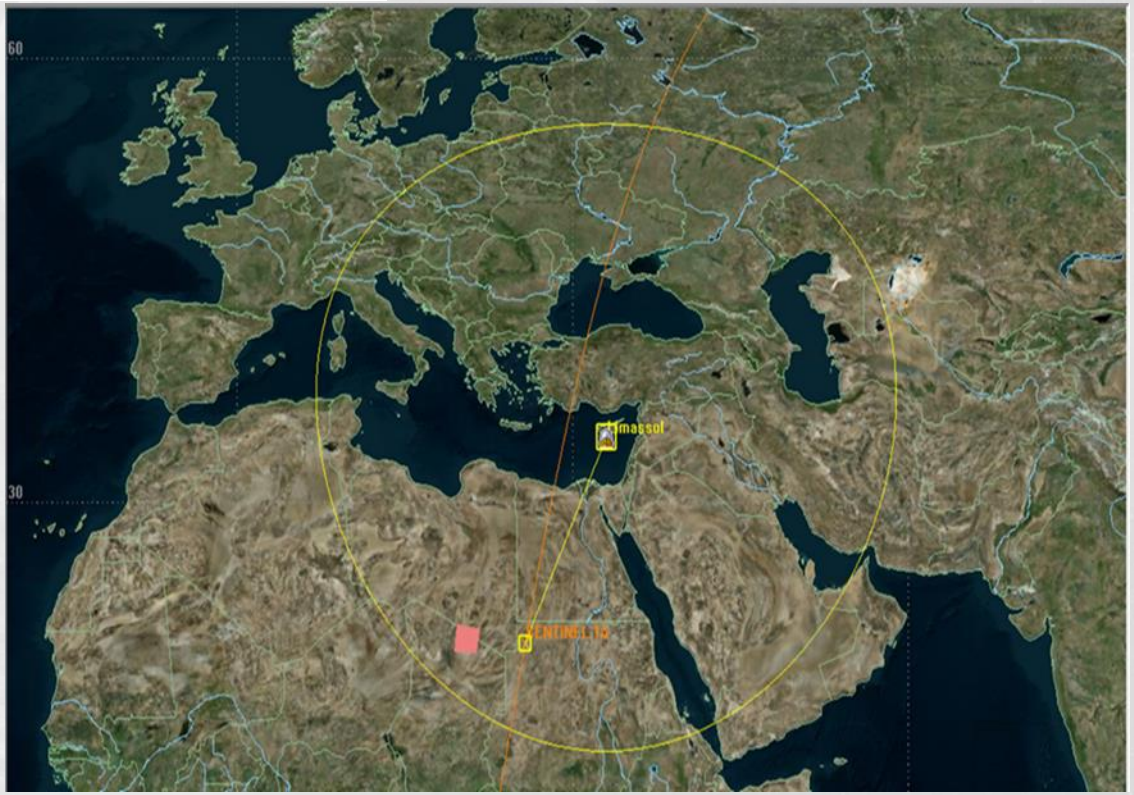
Data Acquisition Station (DAS)

Through governmental funding ECoE has acquired key infrastructure and equipment that will directly contribute to the Research Excellence and Service capacity of the ECoE such as the Data Acquisition Station (DAS).

The DAS is being purchased and will be operational offering Commercial Services for international Business Customers in December 2025

Within EXCELSIOR, ECoE is supported – amongst others – by the **German Aerospace Center (DLR)** in establishing DAS

CYTA – as strategic partner of ECoE – will host and operate DAS



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Technical Description of the Data Acquisition Station

- 9m full-motion Triband Antenna from Safran -France
- To be installed at 35°.049 longitude & 33°.284 latitude
- Simultaneous Reception in S, X & Ka Bands
- Tracking satellites orbiting as low as 400km
- Horizon visibility down to 5° elevation
- Transmit capability in S-Band (both RHCP & LHCP) for TT&C services
- Transmit EIRP up to 60dBW per polarization
- Pointing accuracy:< 0,045° rms
- Tracking accuracy: < 0,015° rms
- Cortex Low & High Data Rate Baseband equipment
-

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GBS ATMOSPHERIC REMOTE SENSING STATION IN LIMASSOL: Fully operational

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MSc in Geoinformatics and Earth Observation (English & Greek)

- Geographic Information Systems (GIS) and Science
- Geospatial Data Acquisition
- Remote Sensing and Earth Observation
- Digital Imaging, Photogrammetry & Computer Vision
- Research Methods: Geoinformatics & Earth Observation
- Geospatial Data Science
- Earth Observation for Environmental Monitoring
- Space-based Positioning and Deformation Monitoring Techniques
- Specialization: Geoinformatics & Earth Observation
- **Special Topics in GIS**
- **Special Topics in Earth Observation**
- **Special Topics in Earth Data Analytics**

https://www.cut.ac.cy/studies/masters/

ΔΙΠΑΕ CYQAA THE CYPRUS AGENCY OF QUALITY ASSURANCE AND ACCREDITATION IN HIGHER EDUCATION

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Department of Civil Engineering and Geomatics – PhD in Civil Engineering and Geomatics in EXCELSIOR thematic areas/ fully funded!

EUROPEAN UNIVERSITY OF TECHNOLOGY
"Think human first"

Studies start in September / Apply Now!

Co-supervision with Excelsior Partners/ Universities (in English)

240 ECTS are required to obtain a Doctoral Degree.
240 ECTS splitted into 8 semesters of 30 ECTS each.
Maximum 60 ECTS are required in modules and **minimum 180 ECTS in research.**

https://www.cut.ac.cy/studies/phd/PhD+vacant+positions/Civil+Engineering+and+Geomatics/

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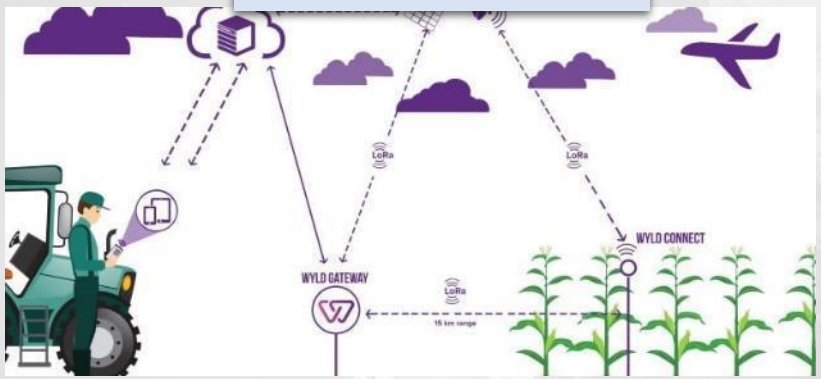
AGRICULTURE – Living Labs

Technology-enhanced Agriculture

Smart Water Resources Management for Irrigation & Precision Agriculture



- ECOSYSTEM to co-design, monitor and evaluate new and existing agricultural practices and technologies
- AIMING to improve their effectiveness and early adoption
- BRINGING TOGETHER: Farmers, Scientists, Policymakers, the Agri-food industry and other interested Private and Public Actors

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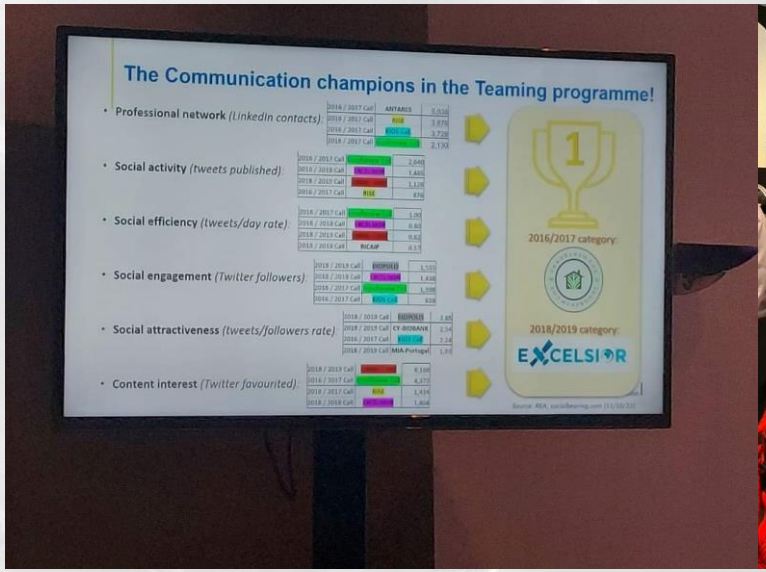
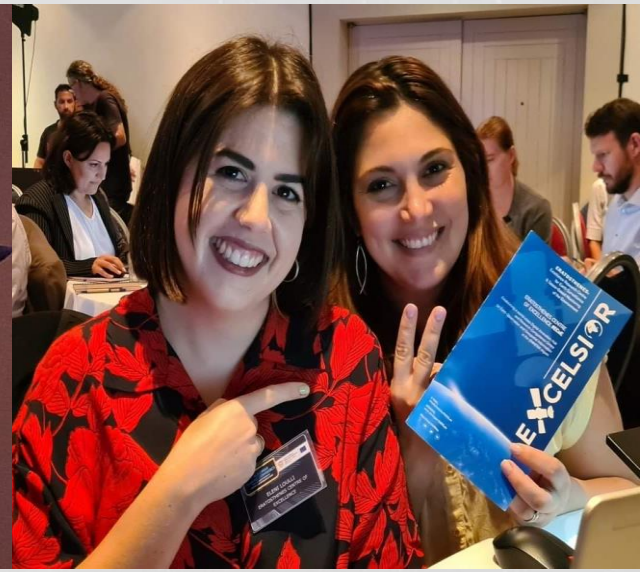
Exploitation and commercialisation

Identification of user needs and data collection	EO Big Data AI management platform	AI-EO risk assessment of environmental hazards in Cyprus	Commercialisation of the exploratory project's outputs
• Meetings with local stakeholders • User needs • Concept design of the EO Big Data AI management platform • Data collection	• Handle multi-source data EO inputs • APIs • Monitor and assess the data in real time, through visualizations and dashboards	• Earthquakes, landslides, soil erosion, forest fires, floods, marine pollution • AI-assisted data fusion techniques	• First combined AI-EO products • AI-OBSERVER final workshop to stakeholders/public • Roadmap towards commercialisation

Funded by the European Union
Grant Agreement No. 101079468

Communication Champions in the Teaming Programme





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Join Excelsior & Eratosthenes CoE

- In common proposals
- Co-design-co-develop
- Registered to follow webinars, experts talks, trainings,
- capacity buildings (upon MOU)

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Call for collaborations/ Joining Forces!

Stakeholders+ Partners+ Business

- First and second responders (disaster risk reduction / management)
- Associations linked with end-users (such as farmers)
- Partners from multidisciplinary areas (agriculture, marine, climate changes, disaster risk reduction, water resources, transport, digital twin, education, etc.)
- Border management authorities (such as coastguards, police)
- Policy makers (public and private)

Calls

- Horizon Europe
- Interreg (MED, Europe, GR-CY)
- ESA PECS
- PRIMA
- Research and Innovation Foundation (CY)
- Tenders and Provision of Services
- ERASMUS+
- LIFE
- ECHO

HORIZON EUROPE
European Union Civil Protection and Humanitarian Aid
PRIMA PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA
RESEARCH & INNOVATION FOUNDATION
Life
Interreg Mediterranean
esa

Vacancies at ERATOSTHENES Centre of Excellence
Join our team!

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Thank you

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TROPOS
Leibniz Institute for Tropospheric Research

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DEPARTMENT OF ELECTRONIC COMMUNICATIONS

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