

# NEANIAS - Novel EOSC Services for Emerging Atmosphere, Underwater & Space Challenges

## Project Overview

### Project Coordinator:

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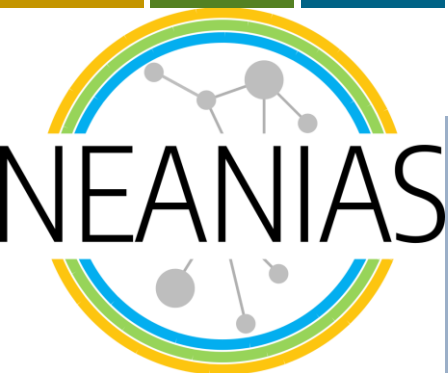


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[www.neanias.eu](http://www.neanias.eu)

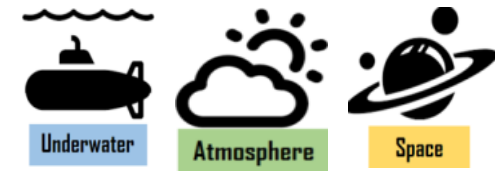


Novel EOSC Services for Emerging  
Atmosphere, Underwater & Space  
Challenges

NEANIAS receives funding from  
European Union under Horizon  
2020 Research and Innovation  
Programme under grant  
agreement No. 863448



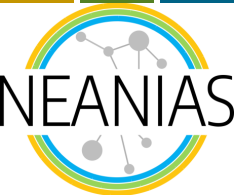
# NEANIAS Overview



- › NEANIAS promotes **Open Science** practices and plays active role in the materialization of the **EOSC ecosystem** by efficiently engaging large scientific and professional communities and actively contributing to the technological, procedural, strategic and business development of EOSC. NEANIAS has driven the co-design and delivery of **innovative thematic services**, derived from state-of-the-art research assets and practices in three major sectors: **Underwater** research, **Atmospheric** research and **Space** research, each engaging a wide variety of academic and business groups, numerous researchers, professionals and governmental entities. Moreover, NEANIAS has identified and promoted cutting-edge **business cases** across several user communities and has laid out several concrete **exploitation opportunities**.

# Overall Project Objectives


- › Address community-specific needs for underwater, atmosphere and space research sectors
- › Multidisciplinary communities
- › Alignment with European Innovation Strategies (e.g. EIC, Innovation Radar)
- › Onboard communities to the Open Science, EOSC and interdisciplinary research era
- › Nurture new business opportunities
- › Power-up EOSC




# NEANIAS Consortium

#	Participant Organisation Name	Acronym	Country
1	National and Kapodistrian University of Athens - Coordinator	NKUA	GR
2	Athena - Research and Innovation Center	ATHENA	GR
3	Istituto Nazionale di Astrofisica	INAF	IT
4	Magyar Tudományos Akadémia Számít. és Automatizálási Kutatóintézet	SZTAKI	HU
5	Coronis Computing SL	CORONIS	ES
6	Ubiwhere LDA	UBIWHERE	PT
7	Communication & Information Technologies Experts S.A.	CITE	GR
8	University of Portsmouth Higher Education Corporation	UOP	UK
9	Universite d'aix Marseille	AMU	FR
10	Universitaet Bremen	UBREMEN	DE
11	Università Degli Studi di Milano Bicocca	UNIMIB	IT
12	Ricoh Spain IT Services SLU	RICOH	ES
13	Jacobs University Bremen GGMBH	JUCOBSUNI	DE
14	inCITES Consulting SARL	INCITES	LU
15	Innomine Group KFT	INNOMINE	HU
16	Eunice Energy Technologies GMBH & CO. KG	EUNICE	DE
17	Meteorological Enviromental Earth Observation S.r.l.	MEEO	IT
18	Consortium GARR	GARR	IT
19	Aerospace Logistics Technology Engineering Company SPA	ALTEC	IT
20	National Observatory of Athens	NOA	GR
21	Teledyne Reson A/S	Teledyne	DK

# NEANIAS: Services – Infrastructures – Communities & Business



**Underwater Environment**   **Atmospheric Environment**   **Space Astro/Planet**



**Co-design, Innovative Thematic Services Tailored to Specific Data Cycle Processes**



**Develop/ Integrate Cross-Cutting Core & Thematic Services at EOSC**



**EUROPEAN OPEN SCIENCE CLOUD**  
**OpenAIRE**  
**ESFRI**   **ESI**  
**EOSC-hub**   **EOSC pilot**   **EUDAT**


**Exploit Existing EOSC Services & the EU Open Science Ecosystem**

**Engage User Communities**

**Underwater**   **Space**   **Atmosphere**

**+ additional business cases**



**NEANIAS Innovation Hub**

# Diversity of communities within research sectors

for the Underwater sector	for the Atmospheric sector	for the Space sector
<ul style="list-style-type: none"> <li>✓ archaeologists</li> <li>✓ geologists</li> <li>✓ oil &amp; gas engineers</li> <li>✓ renewable energy planners</li> <li>✓ robotics</li> <li>✓ submarine geohazards</li> <li>✓ computer vision/ machine learning software engineers</li> <li>✓ insurance</li> </ul>	<ul style="list-style-type: none"> <li>✓ geologists</li> <li>✓ urban air quality authorities</li> <li>✓ meteorological services</li> <li>✓ energy and power sector</li> <li>✓ industrial air pollutant emitters</li> <li>✓ ecologists</li> <li>✓ rural urban planners</li> <li>✓ geohazards, civil protection</li> <li>✓ insurance, health</li> </ul>	<ul style="list-style-type: none"> <li>✓ astrophysics scientists</li> <li>✓ planetary scientists</li> <li>✓ planetary mining engineers</li> <li>✓ planetary robotics</li> <li>✓ computer vision/ machine learning software engineers</li> <li>✓ mobile telecommunications</li> <li>✓ space weather</li> <li>✓ space upstream engineers</li> </ul>

# Underwater Environment Challenges/Needs

- › Bathymetry mapping
  - State-of-the-art required expert users using open source software (MB-System13)
- › Underwater (seafloor) image mosaicking
  - Data captured under wildly varying conditions (different lighting apparatus, topography/terrain roughness, presence of refracted light)
- › Seabed classification
  - Experts needed to indicate regions for training supervised algorithm for every region of interest (such as rocks, mud, underwater objects)

# Atmosphere Challenges/Needs

- › Big data gathered and need for
  - monitoring greenhouse gas flux density
  - estimating concentration of gas and particulate in active tectonic/volcanic regions
  - estimating, monitoring and forecasting weather and air quality
- › No standardized or open-source implementations of algorithms; many duplicate versions existing developed by isolated teams



# Space Challenges/Needs

- › Integrate visualization with common scientific workflows
  - Sky surveys composed of individual 2D, 3D or data cube “tiles” for a limited portion of the sky
    - › Limits results for objects extended over multiple contiguous tiles/cubes
    - › No large-scale view of a particular phenomenon
    - › Need tailored services to **map and mosaic** data in self-preserving way
- › Integrate machine learning techniques for automatic detection of structures in large scale multi-dimensional maps
  - e.g., to classify diffuse emission and extract/estimate parameters for compact sources and extended structures.

# Research sector business opportunities

## › Underwater

- E.g., seabed classification → energy power cabling planners & gas engineers

## › Atmosphere

- E.g., air quality monitoring → urban planning & real estate, agriculture productivity, insurance/health

## › Space

- E.g., virtual/augmented reality → national space agencies, space museums, planetariums

# NEANIAS in EOSC

- › Successfully onboarded to EOSC **11 thematic services** in underwater, atmosphere and space research domains
  
- › Multiple rounds of user validation and assessment for all thematic services
  
- › Delivered **generic core reusable** services
  - Provide essential EOSC onboarding support to thematic services
  - Authentication, authorization, data sharing, logging, accounting, etc.
  - **3 core services onboarded** to EOSC

# NEANIAS Business Innovation (1)



- › Two NEANIAS business innovation cases:
  - Energy
    - › exploit underwater services for operation of wind turbines and underwater cable installation
  - Environmental monitoring in smart cities
    - › perform air quality estimation, monitoring, and forecasting for smart city operation
  - Assessed and evaluated business cases by their end users and by the corresponding business model

# NEANIAS Business Innovation (2)



- › Triggered new business innovation through 2 rounds of targeted Open Innovation Calls

and

- › Thematic (4) datathons/hackathons around offerings of NEANIAS thematic services
- › Multiple results – new ideas come to reality through potential start – ups (-thons) and already existing start-ups and spinoffs gained a lot of business potential and leverage

# NEANIAS Business Innovation (3)



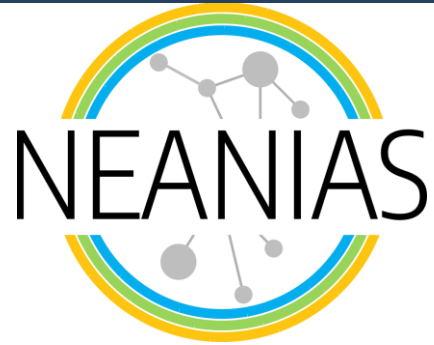
## WE ARE VERY PROUD AS NEANIAS TO SUPPORT:

- **EnaliaTec**: 3D Seabed Mapping and Classification Utilizing Sonar-Based Information
- **Sotiria**: Design high quality renders to showcase the deployment of technology with the integration of NEANIAS services
- **OWL LDA**: OWL intends to quantify air pollution and understand its temporal evolution in the urban context, using the Air Quality Estimation, Monitoring and Forecasting service.
- **GEOInsight**: Mobile cell data aggregation tool to monetize human mobility data, meeting privacy and data protection requirements
- **DDQ**: Enrich existing service with AI and forecasting models and implement GEO standards.
- **Relief Applications**: First affordable professional search system with dogs and drones
- **Walldone**: A web-based, flexible and adaptable "mechanism" to manage more effectively the transformation of the built environment towards climate neutrality, in the context of smart cities.

# NEANIAS take away



- 14 services onboarded to EOSC
- 1140 users and validators of multiple thematic and ICT communities
- 2 NEANIAS Business Cases
- 7 External SMEs exploiting NEANIAS services to broaden their business offerings though 2 very successful Open Calls
- Participation in many Fairs/Conferences/Exhibitions/Commercial Events
- 24 Peer reviewed scientific publications supporting science evolution
- Very active in Social media for public attraction and outreach - 320.000 social media impressions
- Liaison and linking to many European and national projects and Infrastructures
- Large number of students, PhD and post – docs liaised
- **HIGH POTENTIAL FOR SUCCESSFUL CONTINUATION**



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# Thank you!!

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22 SEPT 2022

NEANIAS OPEN EVENT