

October 2023 - September 2024

A BSERVER

Scientific excellence and innovation capacity through
Artificial Intelligence in the field of Earth Observation
on environmental hazards



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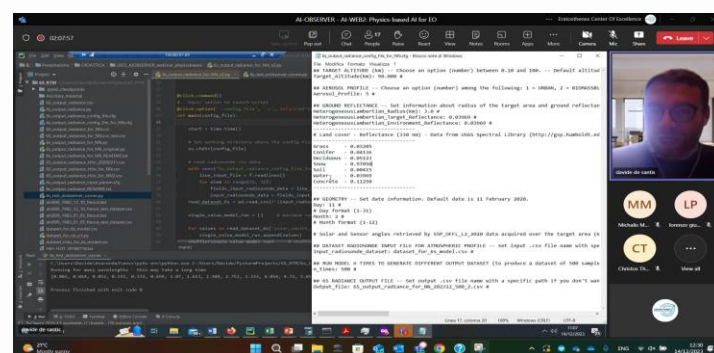
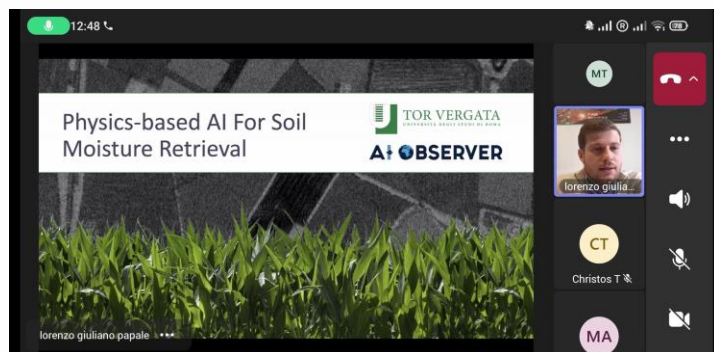
2 November 2023

✈ On **2 November 2023**, a meeting was held with representatives of the **Cyprus Civil Defence**, where the activities of the **ERATOSTHENES Centre of Excellence** were presented. During the meeting, we discussed the expected outputs of the **AI-OBSERVER Project** and how it can support the Civil Defence in **monitoring and managing risks, particularly in relation to critical infrastructure and disaster preparedness**.



14 December 2023

On 14 December 2023, ERATOSTHENES Centre-of Excellence personnel had the opportunity to attend an online training (webinar) organized by the AI-OBSERVER project Advanced Partner Università di Roma Tor Vergata (UNITOV) on the topic of physics-based AI for soil moisture retrieval. Many thanks to our trainers Prof. Fabio Del Frate, Dr Davide De Santis and Mr Lorenzo Giuliano Papale.



19 December 2023

On 19 December 2023, Prof. Diofantos Hadjimitsis, presented the activities of the ERATOSTHENES Centre of Excellence at Ayiou Neophytou Lyceum in Pafos. A key part of his presentation was focused on the AI-OBSERVER project, outlining the project objectives and the innovative applications of Artificial Intelligence in Earth Observation.

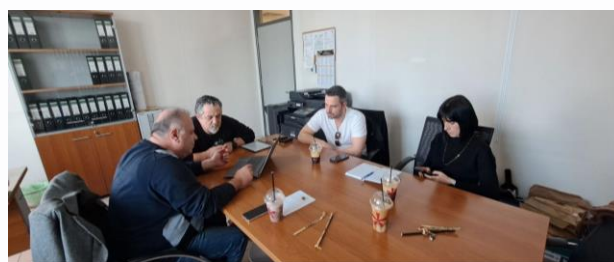
22-24 January 2024

✈️ The **third AI-OBERVER project workshop** took place between **22 and 24 January 2024**. Led by the project's advanced partner **DFKI** and hosted by the **ERATOSTHENES Centre of Excellence**, the workshop was also **broadcasted online** for remote participants. The workshop, titled **AI and EO for land movements (earthquakes, landslides, soil erosion)**, focused on **UAS (drone) platforms for ground morphology analysis, ground moisture monitoring (using SAR, meteorological data, and AI), and soil erosion monitoring and mapping (with various types of data and AI)**. The three-day event featured expert trainers including **Dr. Daniele Latini (UNITOV-GEO-K SRL), Lorenzo G. Papale (UNITOV), Fabio Del Frate (UNITOV), and Giorgia Guerrisi (UNITOV)**.



9 February 2024

✈ On 9 February 2024, a meeting was held with representatives of the **Department of Forests**, where the activities of the ERATOSTHENES Centre of Excellence were presented. During the meeting, we discussed the collaboration in the framework of the **AI-OBSERVER project** and how it can **support disaster risk reduction efforts**, particularly in relation to forest fires.



13 February 2024

✈ On 13 February 2024, a meeting was held with **Mr. Stelios Zervos** and **Ms. Maria Ermogenous** from the **Public Works Department** at the premises of **ERATOSTHENES Centre of Excellence**. During the meeting, we discussed the Department's needs and had a **fruitful discussion** on how the **AI-OBSERVER project** can assist in monitoring **critical infrastructure** and supporting **disaster risk reduction efforts**, particularly in addressing **coastal erosion**.

23 February 2024

✦ On 23 February 2024, the AI-OBSERVER project, along with the activities of the Disaster Risk Reduction sector of the ERATOSTHENES Centre of Excellence, was presented by Prof. Diofantos Hadjimitsis during an online event organized by HellasGIs. The presentation, which covered the objectives, methodology, and benefits of the project, was part of a broader session titled **“The EXCELSIOR H2020 Teaming and ERATOSTHENES Centre of Excellence: Remote Sensing Applications”**.

Παρασκευή 23 Φεβρουαρίου 2024 και ώρα 16:30
 η Hellas G.I.S διοργανώνει διαδικτυακή παρουσίαση με τίτλο:
«Η Κύπρος στο χώρο του Διαστήματος μέσω του έργου EXCELSIOR H2020 Teaming και του Κέντρου Αριστείας Ερατοσθένης: ο δρόμος προς την αριστεία & την καινοτομία»
 Εισηγητής : Καθ. Διοφάντος Χατζημιτσής

Τμήμα Πολιτικών Μηχανικών και Μηχανικών Γεωπληροφορικής, Εργαστήριο Τηλεπισκόπησης και Γεωπεριβάλλοντος, Τεχνολογικό Πανεπιστήμιο Κύπρου, Διευθυντής Συμβούλος Κέντρου Αριστείας Ερατοσθένης & Συντονιστής του Έργου EXCELSIOR H2020 Teaming, Υπάρχουσα, Ακαδημαϊκών Υποθέσεων-ΤΕΠΑΚ & Αντιπρόεδρος του Φορέα Διασφάλισης και Πιστοποίησης της Ποιότητας της Ανώτερης Εκπαίδευσης (ΔΙΠΛΕ)

Για δηλώσεις συμμετοχής παρακαλούμε για την αποστολή των στοιχείων σας (e-mail, ονοματεπώνυμο, ειδιότητα) έως την Πέμπτη 22/2 και ώρα 16:00 στο:
https://docs.google.com/forms/d/e/1FAIpQLSezjYh_unfA9Qz4uj81D-dJ8v8lQapmbu4XvFmD871w/viewform?uc=0&c=0&w=1&fr=0

AI-OBSERVER

Το έργο AI-OBSERVER

- Τίτλος: Ενίσχυση των δυνατοτήτων Παρατήρησης Γης του Κέντρου Αριστείας ΕΡΑΤΟΣΘΕΝΗΣ για τη μείωση του κινδύνου καταστροφών μέσω Τεχνητής Νοημοσύνης
- Πρόσκληση: HORIZON-WIDERA-2021-ACCESS-03 (Twinning)
- Έναρξη έργου: 1 Οκτωβρίου 2022
- Διάρκεια έργου: 36 μήνες
- Προϋπολογισμός: €1,489,379

Logos of ERATOSTHENES, TOR VERGATA, CELLOCK, and the European Union.

Επίσημη Έπισηή Γεωγραφικών Συστημάτων Πάροχοι

Πρωτόκολλο Συνεργασίας 13 – Οκτωβρίου- 2023

1. Κοινές επιστημονικές, εκπαιδευτικές εκδηλώσεις και δραστηριότητες
2. Συμβουλευτικές - επιστημονικές υπηρεσίες και μελέτες
3. Κοινή συμμετοχή σε ερευνητικά και αναπτυξιακά προγράμματα (Ευρωπαϊκά – Εθνικά– Διεθνή)
4. Ανταλλαγή πληροφοριών και τεχνογνωσίας σε θέματα κοινού ενδιαφέροντος.

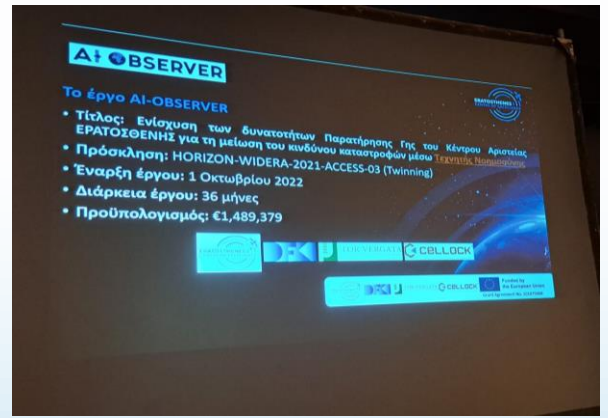
ΠΑΡΟΥΣΙΑΣΗ "Η Κύπρος στο χώρο του Διαστήματος μέσω του έργου EXCELSIOR H2020 Teaming" και του Κέντρου Αριστείας Ερατοσθένης: ο δρόμος προς την αριστεία...

Participants list includes: ERIOST (DANITHI MARENYICA), Centro Alcala, Georgios Emman, Maria Anastasiadou, Marios Tzouvaras, Michalis Mavrounoulis, Pradikos Prastis, Spiros Georg., Varvara Tsirosi, Γεωργιος Κατ., Ειρήνη Τασουλα, Πρατσιας (Guest).

1 March 2024

✦ On 1 March 2024, Prof. Diofantos Hadjimitsis provided an invited talk at Coral Beach Hotel in Pafos during the 11th “Conference on Sciences” organized by students and teachers. During his presentation about “The EXCELSIOR H2020 Teaming and ERATOSTHENES Center of Excellence: Remote Sensing Applications”, he presented also the AI-OBSERVER project: objectives, methodology and benefits.

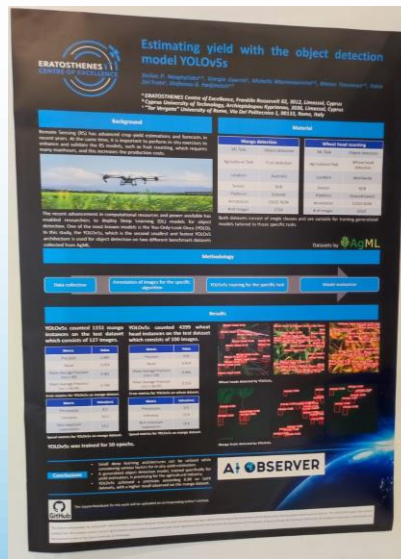
The conference was under the auspices of the Minister of Education, Sports and Youth in Cyprus, Dr Athena Michaelidou. Over 300 participants (students & teachers) from different schools in Cyprus attended the event.



8-9 April 2024

✂ During the 10th International Conference on Remote Sensing and Geoinformation of Environment RSCy24 that took place on 8-9 April 2024 in Paphos, Cyprus, the AI-OBSERVER project was represented with two posters jointly published with project partners:

- **“Enhancing Disaster Risk Reduction through Artificial Intelligence: Capitalising on the Capacity Building activities of the AI-OBSERVER Twinning project”** by *Marios Tzouvaras, Michalis Mavrovouniotis, Renos Votsis, Kyriaki Fotiou, Eleftheria Kalogirou, Thomaida Polydorou, Gerd Reis, Fabio Del Frate, Lorenzo Giuliano, Papale, Giorgia Guerrisi, Diofantos Hadjimitsis.*
- **“Estimating yield with the object detection model YOLOv5s”** by *Stelios Neophytides, Giorgia Guerrisi, Michalis Mavrovouniotis, Marios Tzouvaras, Fabio Del Frate, Diofantos Hadjimitsis.*



RSCy2024

Tenth International Conference on Remote Sensing and Geoinformation of Environment' 08-09 April 2024 - Cyprus

15 May 2024

✈ Dr Marios Tzouvaras (ERATOSTHENES CoE) and Prof. Fabio Del Frate (UNITOV) serve as Guest Editors at a Special Issue “**Applications of Remote Sensing for Natural Hazard and Environment Monitoring**” at the Applied Sciences journal.

 *applied sciences*
an Open Access Journal by MDPI

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Applications of Remote Sensing for Natural Hazard and Environment Monitoring

Guest Editors
Dr. Marios Tzouvaras, Dr. Chris Danezis, Dr. Charalampos Kontoes, Prof. Dr. Fabio Del Frate

Deadline
20 November 2024

Special Issue

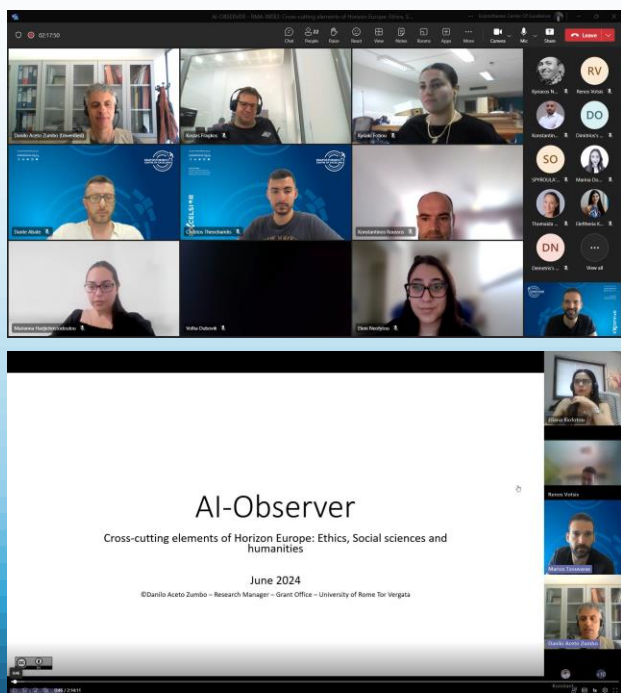
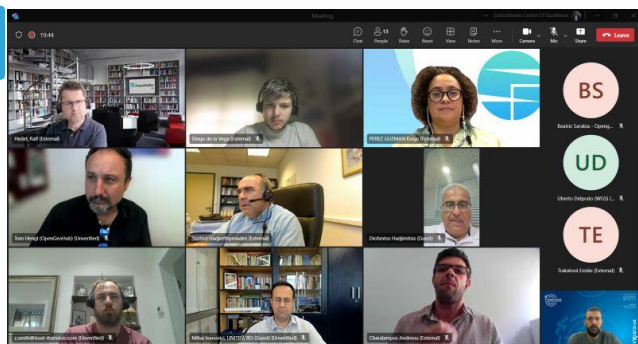
mdpi.com/si/204547 Invitation to submit

The special issue aims to collect high-quality contributions to the advancement of satellite remote-sensing technologies/solutions for environmental monitoring and natural hazard detection, monitoring and modelling, risk and impact assessments, disaster management, early warning systems, and decision support systems. For more information please visit:

https://www.mdpi.com/journal/applsci/special_issues/N8LFCSOJW8

6 June 2024

✈ On **6 June 2024**, ERATOSTHENES CoE Managing Director Prof. Diofantos Hadjimitsis and Research Coordinator Dr. Marios Tzouvaras of **ERATOSTHENES Centre of Excellence** participated in a networking online meeting organized by the **EO4EU project**. During the meeting, Dr. Tzouvaras presented the **AI-OBSERVER project**, coordinated by the **ERATOSTHENES Centre of Excellence**, highlighting the project's objectives, **outcomes**, and **upcoming products**. The presentation focused on the use of **artificial intelligence and earth observation technologies** aimed at **enhancing disaster risk reduction**.



7 June 2024

✈ On **7 June 2024**, staff of the **ERATOSTHENES Centre of Excellence** had the opportunity to attend an online training (webinar) organized by the **AI-OBSERVER project** advanced partners, **Università di Roma Tor Vergata**, on the topic **“Cross-cutting elements of Horizon Europe: Ethics, Social Sciences, and Humanities.”** Many thanks to our speaker **Mr. Danilo Aceto Zumbo** for delivering this insightful session.

12-28 June 2024

✂ On 12-17 and 24-28 June 2024, staff from the ERATOSTHENES Centre of Excellence were trained on Artificial Intelligence at the premises of EO Lab, Tor Vergata University, Italy. Researchers Maria Prodromou, Eleftheria Kalogirou, Stelios Neophytides, Konstantinos Christofi, and Konstantinos F. Panagiotou from ERATOSTHENES CoE participated. The training, part of the AI-OBSERVER project, focused on AI applications in Earth Observation and environmental disaster monitoring. The sessions enriched the collaboration between the two institutions, promoting joint research and strategic partnership development. Special thanks go to the dedicated trainers, Dr. Daniele Latini, Lorenzo G. Papale, Fabio Del Frate, and Giorgia Guerrisi.



7-12 July 2024

The AI-OBSERVER project participated in the **International Geoscience and Remote Sensing Symposium (IGARSS 2024)** in Athens, Greece, between 7 and 12 July 2024. The project showcased its work through both poster and oral presentations.

Posters:

- Empirical Analysis of Oil Spill Detection Methods.
- An Empirical study of regression algorithms for Soil Organic Matter prediction.

Oral presentations:

- Enhancing Earth Observation Capabilities of the ERATOSTHENES Centre of Excellence on Disaster Risk Reduction through Artificial Intelligence: Introducing the AI-OBSERVER project
- Prediction of Groundwater Salinization Using Particle Swarm Optimization for Neural Network Training



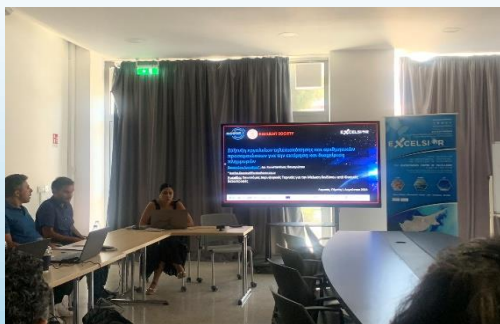
16-19 July 2024

The AI-OBSERVER project was represented at the **Joint SCERIN and MedRIN NASA Workshop**, held in Chania, Greece on 16-19 July 2024, with a poster presentation by Prof. Diofantos Hadjimitsis from the ERATOSTHENES Centre of Excellence.



1 August 2024

✂ On **1 August 2024**, a dissemination event, organised in the framework of EXCELSIOR project, was held at the ERATOSTHENES Centre of Excellence premises. During this event, the **AI-OBSERVER project** was presented engaging key stakeholders in Disaster Risk Reduction. Participants included representatives from **Civil Defence, the Department of Forests, the Water Development Department, the Department of Public Works, the Limassol, Amathounta, and Polemidia Municipalities, insurance companies, and ERATOSTHENES Centre of Excellence staff.**



5 September 2024

✂ On 5 September 2024, **four new conference papers** were published in the **IEEE IGARSS 2024** proceedings as part of the **AI-OBSERVER project** in collaboration with our esteemed partners:

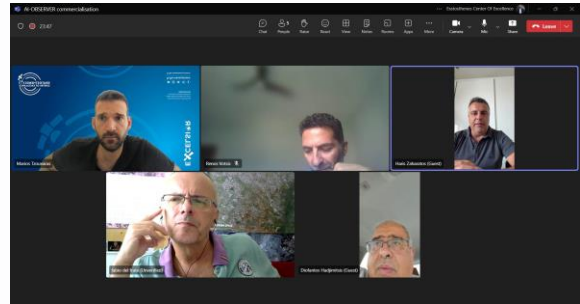
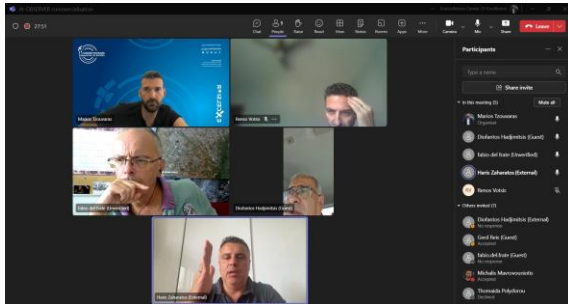
- **“Enhancing Earth Observation Capabilities of the ERATOSTHENES Centre of Excellence on Disaster Risk Reduction Through Artificial Intelligence: Introducing the AI-OBSERVER project”** authored by *Marios Tzouvaras, Gerd Reis, Fabio Del Frate, Haris Zacharatos, Diofantos Hadjimitsis*. Available at: [10.1109/IGARSS53475.2024.10640751](https://doi.org/10.1109/IGARSS53475.2024.10640751)
- **“Prediction of Groundwater Salinization Using Particle Swarm Optimization for Neural Network Training”** authored by *Stelios P. Neophytides, Michalis Mavrovouniotis, Constantinos F. Panagiotou, Marinos Eliades, Anis Chekirbane, Diofantos Hadjimitsis*. Available at: [10.1109/IGARSS53475.2024.10641861](https://doi.org/10.1109/IGARSS53475.2024.10641861)
- **“Empirical Analysis of Oil Spill Detection Methods”** authored by *Eleftheria Kalogirou; Michalis Mavrovouniotis; Marios Tzouvaras; Christodoulos Mettas; Evagoras Evagorou; Diofantos Hadjimitsis*. Available at: [10.1109/IGARSS53475.2024.10642731](https://doi.org/10.1109/IGARSS53475.2024.10642731)
- **“An Empirical Study of Regression Algorithms for Soil Organic Matter Prediction”** authored by *Eleni Neofytou, Stelios P. Neophytides, Michalis Mavrovouniotis, Marinos Eliades, Christiana Papoutsas, Diofantos G. Hadjimitsis*. Available at: [10.1109/IGARSS53475.2024.10642115](https://doi.org/10.1109/IGARSS53475.2024.10642115)

These papers highlight the collaboration between **ERATOSTHENES Centre of Excellence, Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI), University of Rome Tor Vergata, and Cellock Ltd.**



6 September 2024

✂ On 6 September 2024, a very fruitful meeting was held with all project partners to discuss the commercialization aspects of the **AI-OBSERVER project** and its products, putting them on the right track.



10 September 2024

✂ On 10 September 2024, a new publication titled "A Generalized Machine Learning Approach for Cost-Effective Monitoring of Irrigation Suitability: A Case Study in El Fahs Aquifer (Tunisia)" was released as part of the **AI-OBSERVER project**, in collaboration with the **University of Cyprus and INAT**. It has been published in *Groundwater for Sustainable Development* (Elsevier, IF: 5). The authors are **Dr. Constantinos Panagiotou** (ERATOSTHENES Centre of Excellence), **Dr. Charalampos Konstantinou** (University of Cyprus), and **Professor Anis Chekirbane** (INAT). Available at: <https://doi.org/10.1016/j.gsd.2024.101324>



13 September 2024

✂ On **13 September 2024**, two new conference papers were published and made available for open access in the SPIE Digital Library as part of the AI-OBSERVER project in collaboration with our esteemed partners.

- “**Enhancing Disaster Risk Reduction through Artificial Intelligence: Capitalizing on the Capacity Building Activities of the AI-Observer Twinning project**” authored by *Marios Tzouvaras, Michalis Mavrovouniotis, Renos Votsis, Kyriaki Fotiou, Eleftheria Kalogirou, Thomaida Polydorou, Gerd Reis, Fabio Del Frate, Lorenzo Giuliano Papale, Giorgia Guerrisi, Diofantos Hadjimitsis*. Available at: <https://doi.org/10.1117/12.3037135>
- “**Estimation of Crop Yield Using Deep Learning for Precision Agriculture,**” is authored by *Stelios Neophytides, Giorgia Guerrisi, Michalis Mavrovouniotis, Marios Tzouvaras, Fabio Del Frate, Diofantos Hadjimitsis*. Available at: <https://doi.org/10.1117/12.3037319>

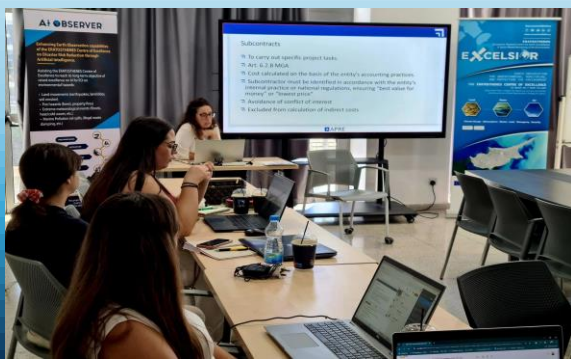
These papers highlight the collaboration between **ERATOSTHENES Centre of Excellence, Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI), University of Rome Tor Vergata, and Cellock Ltd.**



SPIE.

24-26 September 2024

✂ On **24-26 September 2024**, a hands-on **workshop on research proposal preparation skills** took place at the ERATOSTHENES Centre of Excellence premises as part of the **AI-OBSERVER project**. The workshop, organized by our advanced partner University of Rome Tor Vergata and the Agency for the Promotion of European Research (APRE), aimed to enable young researchers and enrich the knowledge of more senior staff in attracting funds from various funding sources. More than 20 researchers and administrative staff attended this training.



27 September 2024

✦ The **European Researchers' Night 2024**, themed "Mission: Possible," was held on **27 September 2024** in Nicosia, attracting over 3,000 students. The event featured more than 60 booths where researchers, universities, and companies showcased high-tech experiments and scientific equipment.

The ERATOSTHENES Centre of Excellence from the Cyprus University of Technology participated with **two booths: "Earth from Above: Remote Sensing and Copernicus" and "Through the Eyes of a Satellite: Observing the Earth from Above."**

A central focus of the event was the **AI-OBSERVER project**, which was highlighted to demonstrate how **Artificial Intelligence can revolutionize Earth Observation, particularly for Disaster Risk Reduction.**

During the presentation, the purpose of AI-OBSERVER was explained in detail, outlining its **aim to enhance Earth Observation capabilities through the use of AI, ultimately improving the detection and monitoring of environmental hazards.**



October 2023 - September 2024

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Artificial Intelligence in the field of Earth Observation
on environmental hazards

