

**ACTION 2020-2-21:
COPERNICUS
FOR CULTURAL HERITAGE**



Copernicus Academy and the Italian Network

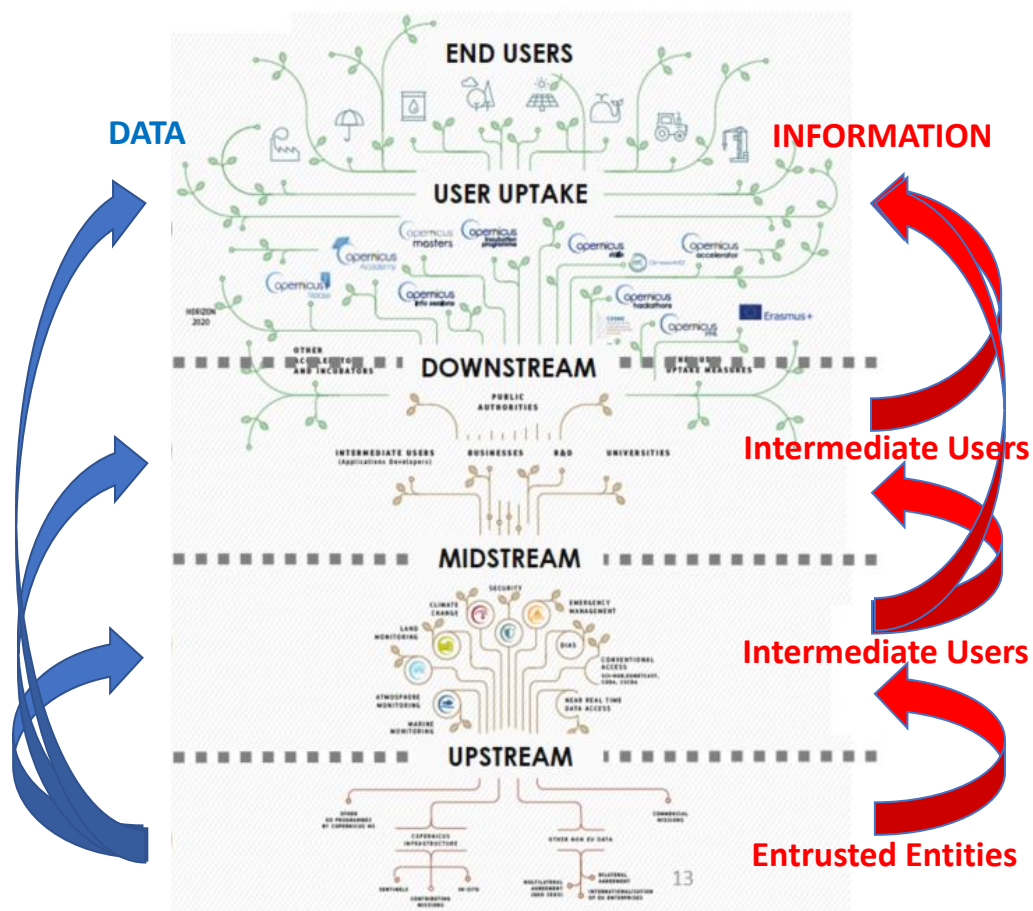
Bernardo De Bernardinis and Maria Vittoria Castellani

Copernicus Academy National Coordination

13-16.06.2023

PARCO REGIONALE DELL'APPIA ANTICA
Ex Cartiera Latina - Via Appia Antica, 42

COPERNICUS STRUCTURE AND ITS 4th COMPONENT: the User Uptake

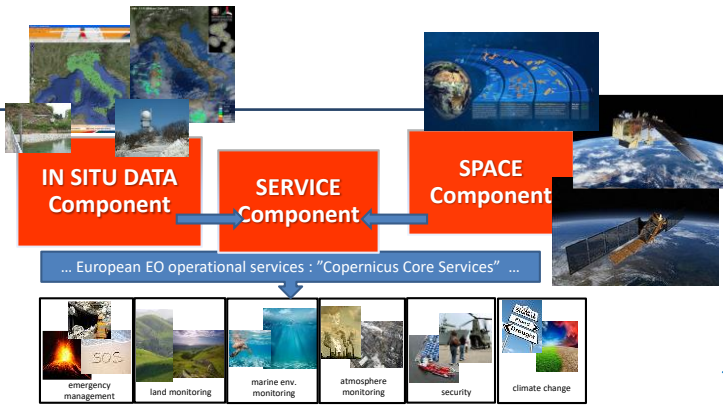


It is the **structure of an Earth Observation Program** like Copernicus, organized in the sequence of its different Components, that shows how inescapable and fundamental it is to reach and engage “end users” through the **User Uptake** final Program Component

However, only in **2014**, for the first time, the **activities aimed at raising awareness, training and dissemination are explicitly dictated and funded** and precisely through the Regulation (EU) No. 377/2014, which establishes the Copernicus Program in continuity with the GMES Program.

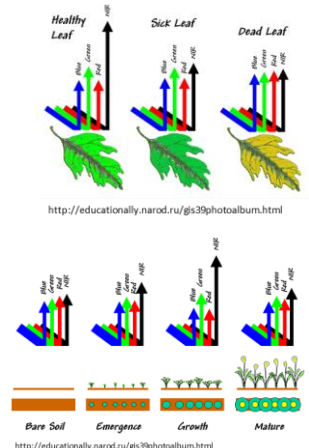
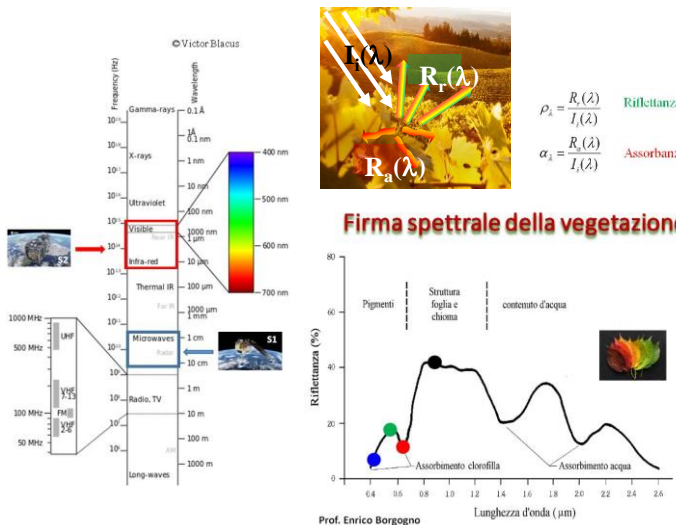
This was even though, already from the experience developed in GMES, it was clear that the combination of **the lack of activities aimed at raising awareness among users** of the usefulness of what Copernicus makes available to them and **the need to acquire a minimum of basic geomatics and computer literacy** in order to proactively access and benefit from it, has been the **main obstacle** to the widespread use, in particular, of the information produced by the Program.

CRITICAL ELEMENTS FOR COPERNICUS DEPLOYMENT



... know some fundamentals, frameworks and how to use Geoinformation platforms ...

... know some principles of remote sensing related to the electromagnetic spectrum and what links its bands to synthetic indices representative of physical, chemical, and biological phenomena ...

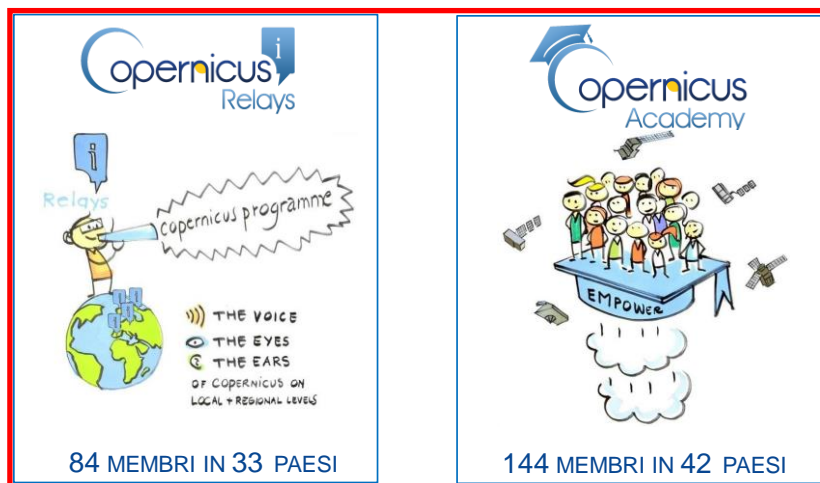


THE COPERNICUS USER UPTAKE: The Relay and Academy European Networks

A structured process of informing and educating users on what Copernicus was producing and making freely available, including to the enterprise, was initiated by the EC and MS, with the User Uptake Strategy in 2016.

(CUF-2016-73)

USER SUPPORT (2018)



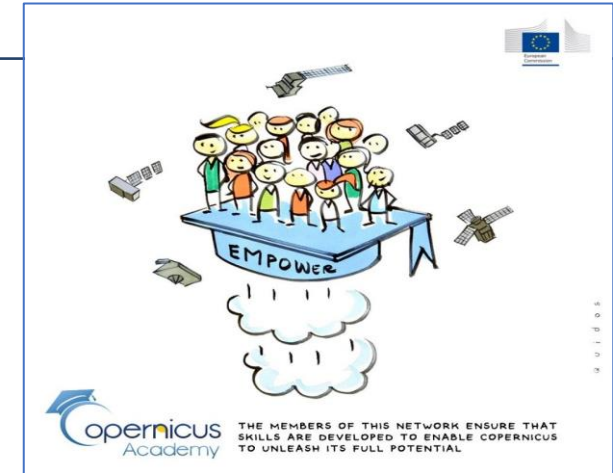
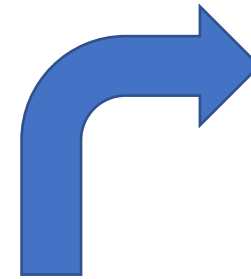
(84) In order to promote and facilitate the use of Earth observation data and technologies by national, regional or local authorities, SMEs, and scientists and researchers, dedicated networks for the distribution of Copernicus data, including national and regional bodies such as Copernicus Relays and Copernicus Academy, should be promoted through dissemination activities among users. (REGULATION (EU) 2021/696)

the European Union should promote the Relays, to inform, listen and assist locally both public administrations and enterprises and the Academies, to inform, educate, train and coach end users, including potential ones

THE COPERNICUS ACADEMY EUROPEAN NETWORK

The decision to establish a European Copernicus Academy Network was based on three key considerations:

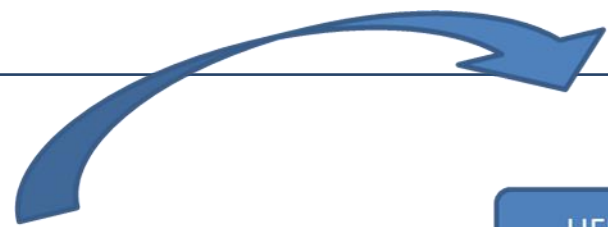
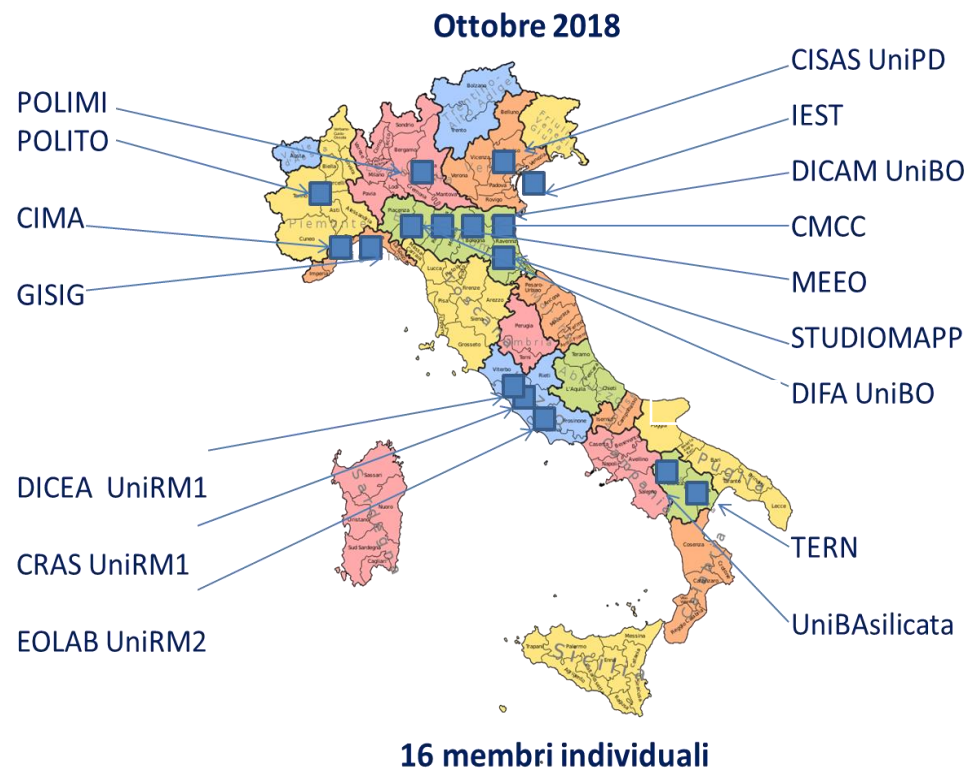
- ✓ in almost all **User Uptake** measures, along with information, **training plays a significant role;**
- ✓ **Involving and training implementers and users, as well as future Copernicus designers, as soon as possible with respect to the EO, GI and ICT principles, methods, tools and services is the most effective and lasting way to achieve User Uptake objectives in the medium and long term;**
- ✓ only by **introducing innovative elements** in educational pathways and training and instructional processes will it be possible to promote **new professional profiles, and/or modify existing ones, to respond to emerging business and/or corporate processes connected with or affected by EO.**



Therefore, **in addition to universities, polytechnics and other academic bodies, public and private entities**, that have among their institutional tasks, or in their business mission, the implementation of educational and training activities, **are admitted to the European Network of Copernicus, Academy.**

Such activities are aimed at students, teachers and researchers, as well as civil servants, professionals and entrepreneurs, namely potential Copernicus Users

THE COPERNICUS ACADEMY EUROPEAN NETWORK

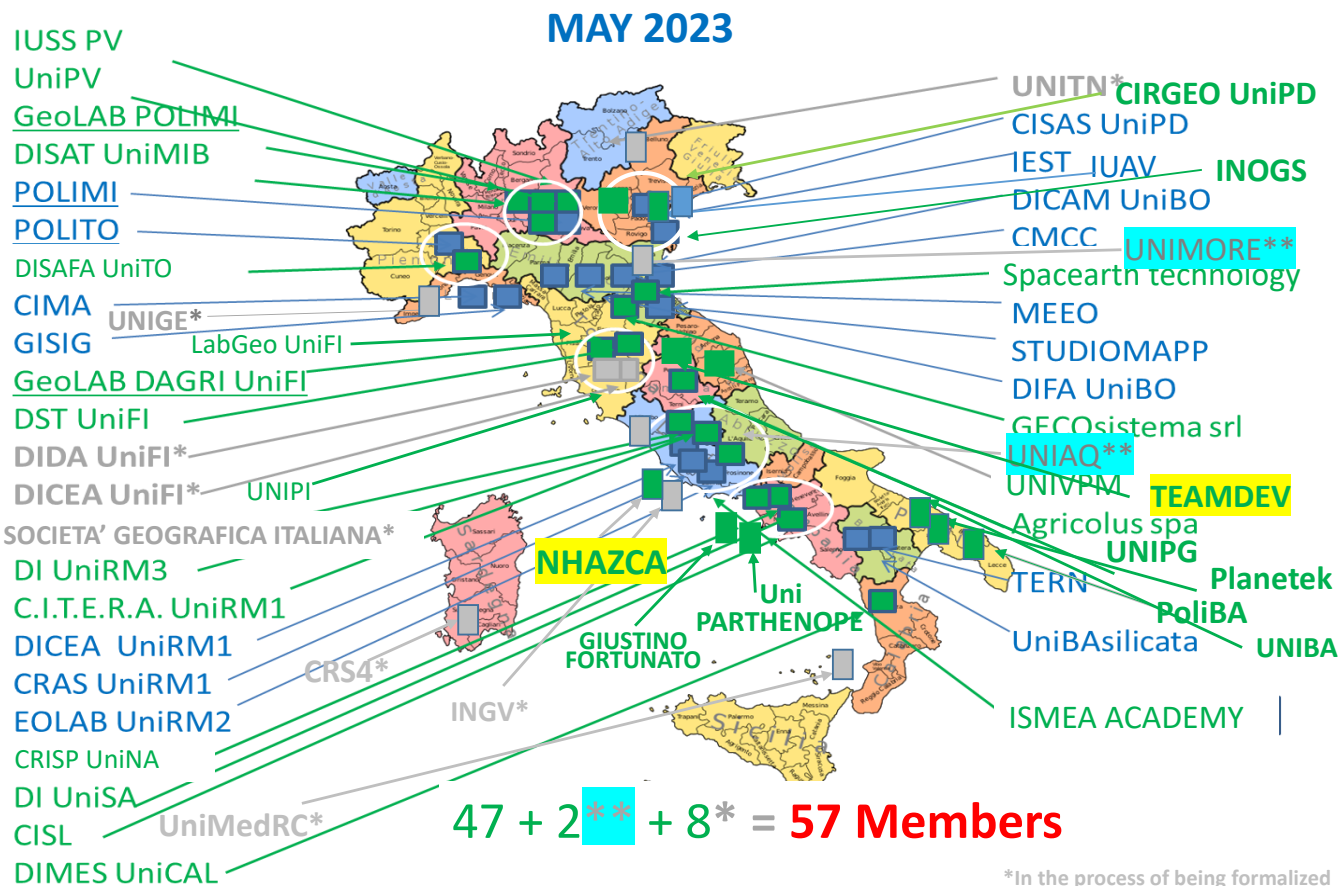


The **National Coordination** is responsible for:

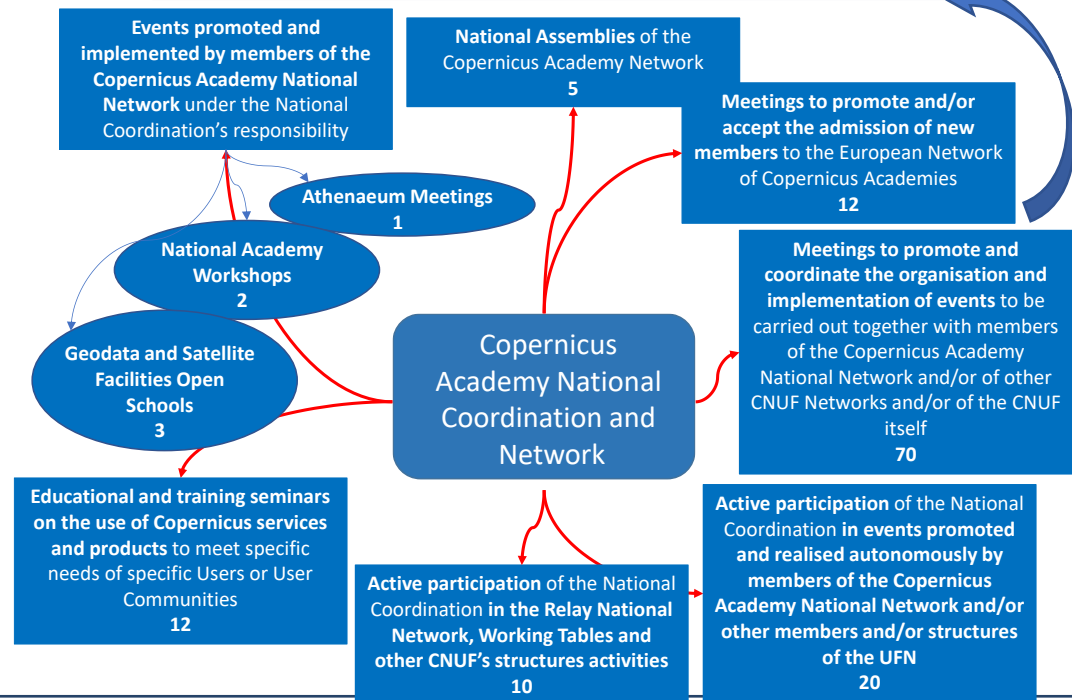
- ✓ **promoting and supporting in a synergistic and coordinated manner** the activities carried out by the national Copernicus Academies;
- ✓ **ensuring their collective representation and participation** in UFN activities;
- ✓ **ensuring relationships**, including operational ones, between the Copernicus Academy's own activities and those promoted within European Strategic Actions, such as the Green Deal, or national and/or other European Programs such as Erasmus+ and Horizon.

the **National Network**, like the European one, in addition to focusing on the introduction and utilization of what Copernicus makes available within the existing educational activities at each of the individual Academy members, **aims at the realization of events, new educational and training processes, even outside the official academic ones, according to shared formats.**

THE COPERNICUS ACADEMY NATIONAL NETWORK: its growth and events



Overall, from 2018 to April 2022, it can be estimated that about 130 events, including massive ones, attended by more than 1500 participants, were held within the National Network.

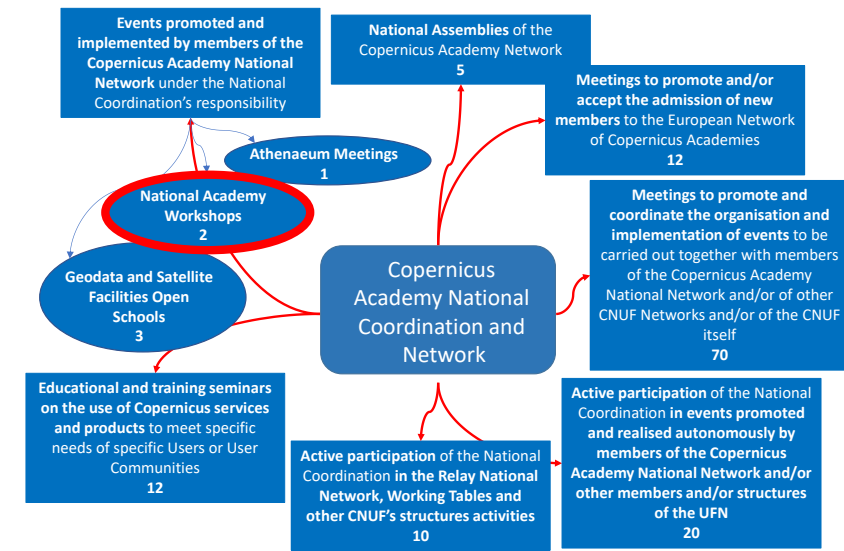


THE COPERNICUS ACADEMY NATIONAL NETWORK: Entrusted Entities and Academy National Workshops

Generally, a **Copernicus Academy National Workshop** foresees the participation of the **EU Commission** and the **European Entrusted Entities** in charge of the Copernicus Core Services to be promoted, the Copernicus National **Delegate** and the National **Copernicus Academy Coordination** as a network of the National User Forum as well as the **local Copernicus Academy member** with whom the event is organized and implemented.

The event:

- ✓ **morning session** is usually dedicated to some **general presentations** as well as to some others more focused on the Workshop topics
- ✓ **afternoon session** is opened to all participants to tangibly see and experience **how to use the Core Service tools, products and information** explained and made available **by Entrusted Entities**, possibly along with those of **downstream services developed by the local Copernicus Academy member**.



THE COPERNICUS ACADEMY NATIONAL NETWORK: Entrusted Entities and Academy National Workshops

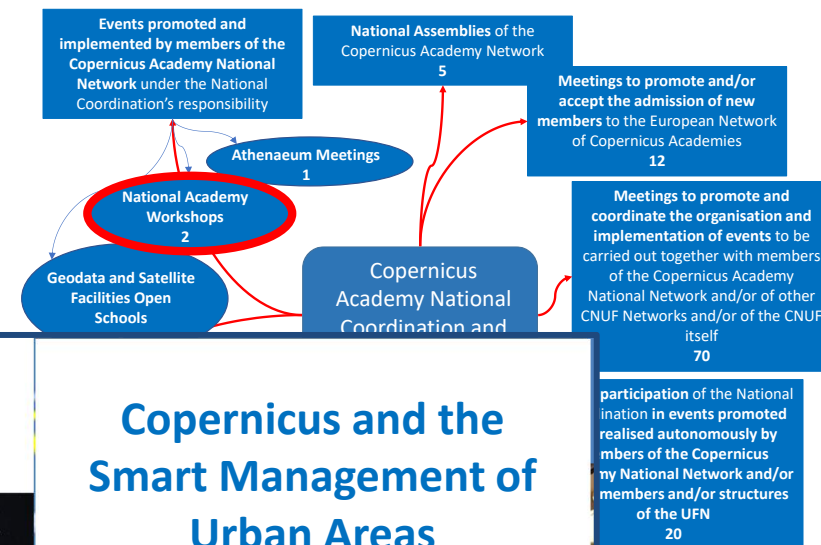
The Academy National Workshop at the Politecnico di Torino on Copernicus Climate Change Service (C3S)

30th of May 2019

more than 170 participants



ECMWF



To promote further Academy National Workshops, Entrusted Entities are needed to be willing to participate in designing and implementing them with us.

Copernicus and the Smart Management of Urban Areas

18th and 19th of November 2020
... more than 200 participants ...

ECMWF & JRC

Copernicus Academy National Workshop
in collaborazione con lo User Forum e la Rete degli Academy Nazionali di Copernicus

THE COPERNICUS ACADEMY NATIONAL NETWORK: Entrusted Entities and Academy National Workshops

The event aims to promote a comparison between our Country's manufacturing capabilities and the needs of both the market and scientific research; it intends to make National User Forum participants aware of technological advances, help industry understand application needs, and improve competitiveness in future Copernicus Program space infrastructure development programs. It will promote an exchange of ideas on future developments of such infrastructure and the services to "observe our planet and environmental changes for the benefit of all European citizens«, that rely on it.



SatTech4EO
Workshop on Satellite Technology and Remote Sensing Techniques for Earth Observation within the Copernicus programme

14-15 June 2023
Faculty of Civil and Industrial Engineering
Sapienza Università di Roma
Via Eudossiana 18, Rome

SAPIENZA UNIVERSITÀ DI ROMA | Copernicus Academy | ISPRA | Istituto Nazionale per lo Studio e la Cura delle Epidemie | European Union | Copernicus

COAST AND MARINE MONITORING | AIR QUALITY | GROUND MOTION | COAST AND MARINE MONITORING | COASTAL AREAS | HYDRO METEOROLOGY CLIMATE SERVICE | MONITORING OF LAND COVER AND USE | INSURANCE TRANSPORT INFRASTRUCTURE DISASTER RISK REDUCTION

AGRICULTURE AND FORESTRY | SECURITY SERVICES | ENERGY | WATER RESOURCES AND MANAGEMENT | HEALTH | TOURISM | EMERGENCY SERVICES

THE COPERNICUS ACADEMY NATIONAL NETWORK: the Copernicus GeoData and Satellite Facilities Open School

They are proposed and organised with the support of the locally present member of the Copernicus Academy National Network

They are addressed to a wide range of users



They involve competent services, competent staff participating in Copernicus Academy activities

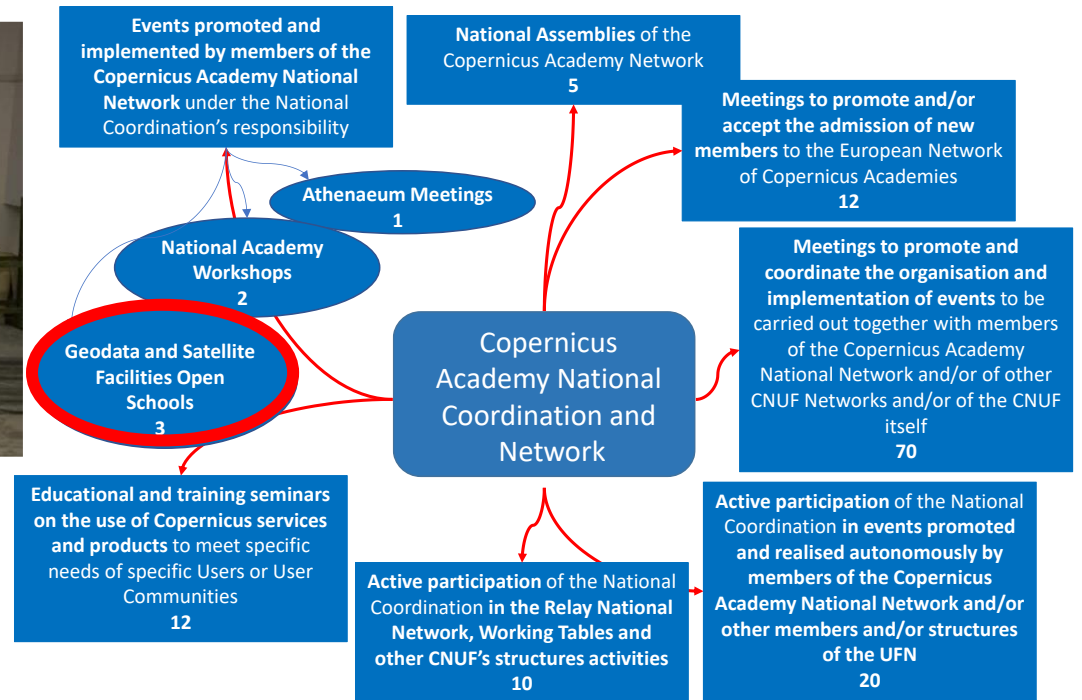
They are focused on the promotion of activities is developed

Committee, which may become permanent



of GI and ICT products of or

the programme Promotion



By 2025, a further six Open Schools, already financed under the FPCUP WP2020, will have to be implemented in the fields of agriculture, aquaculture and urban and coastal management

THE COPERNICUS ACADEMY NATIONAL NETWORK: the Copernicus GeoData and Satellite Facilities Open School



ISMEA Copernicus Open Schools 2022 in Campania

Promoted by ISMEA as part of the National Rural Network and organised with the support of the Campania Region, ARPA Campania, the University of Naples "Federico II" and CREA

Focused on the specific theme of Earth Observation applied to the management of the carbon cycle and the irrigation resource within an agricultural district.

Delivered from remote to over 50 participants, including agricultural consultants and professionals

The enterprises Airespace and Planetek participated in the event

ISMEA Copernicus Open Schools 2022 in Veneto

Promoted by ISMEA within the framework of the National Rural Network and organised with the support of the Veneto Region, the Veneto Agriculture Agency, Arpa Veneto, the University of Padua and CREA

Focused on the specific theme of risk management in agriculture

Delivered in presence, by invitation, to over 40 Consultants and Professionals in Agriculture

The enterprise Planetek participated in the event

GeoData and Satellite Facilities Open Schools 2021 in Perugia

Organised with the support of Agriculus S.r.l., Arpa Umbria, the University of Perugia and ISMEA

Focused on the specific theme of Agriculture 4.0 and Environmental and Business Sustainability.

Delivered remotely, as well as to the local user community, to over 200 participants in total

The enterprises eGeos, Planetek, Agriculus and BlueLife participated in the event

GeoData and Satellite Facilities Open School 2019 in Asti

Organised with the cooperation of the University of Turin and the support of local administrations, AGEA and ARPA Piemonte, as well as the companies eGeos, Planetek and Agriculus

Focused on the specific topic of Viticulture 4.0 and management of the Unesco site "Langhe Roero e Monferrato".

Delivered in presence to 25 participants expressed by the local user community

The enterprises eGeos, Planetek and Agriculus participated in the event

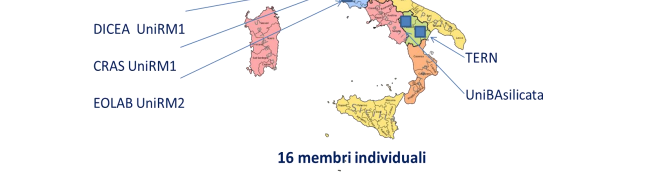
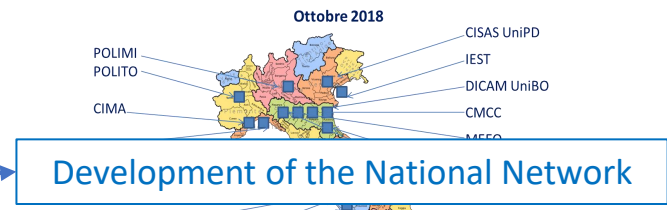
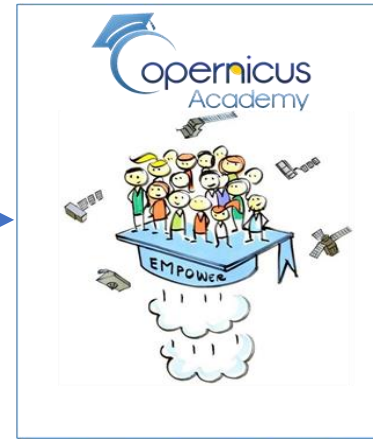


THE COPERNICUS ACADEMY NATIONAL NETWORK: its evolution from "individual" to "collective" events

Position Paper:

The provision of training tools for the rapid qualification of professional profiles, related to the integrated use of OT, GGI and ICT methods and tools, advanced and necessary for the implementation of the innovative actions envisaged by the PNRR

Promotion, development of "collective" tools and actions



Italian Consortium for Copernicus Academy:

To promote and disseminate the culture, knowledge of the fundamentals and use of advanced and innovative OT, GGI and ICT technologies, methods and tools related primarily to the European Copernicus Program and in particular within and for the purposes of its Copernicus Academy

"Aggregated" participation in calls for FPCUP WPs and other European educational and training programs.

Titolo	Tipologia	WP/2020	Area	Stato	Periodo	Importo Totale	Importo Copernicus	Contribuzione	Descrizione
PhD scholarships on Climate Change and Sustainable Development Goals	1	*	OPERA	INIZIATA	2022-45.000 2023-45.000 2024-45.000	135.000,00	84%	113.400,00	2 borse di studio per PhD in qualità e climate change
Observing Understanding and Learning OSL through Training (OUL-T)	1	*	OPERA	INIZIATA	2023-22.000 2024-22.000	44.000,00	84%	36.800,00	Una rapida scuola secondaria e professionale per studenti con bisogni speciali, con un'attenzione particolare per i giovani con disabilità e i giovani con competenze e capacità nel veg
Copernicus/Earthwatch on general satellite facilities and EO services training	1	*	OPERA	INIZIATA	2022-77.500 2023-54.000 2024-54.000	185.500,00	84%	155.820,00	Contribuzione governativa nell'ambito di Copernicus, fornire nuovi corsi anche a supporto degli enti locali per la gestione del territorio, soprattutto nei settori di attività
CAMS - Copernicus Applications for Professional Surveyors	2	*	OPERA	INIZIATA	2022-130.000 2023-130.000	260.000,00	84%	218.400,00	Finanziata a unico studente/ricercatore e sviluppo della ricerca per sviluppare servizi operativi. Sviluppo del servizio "Service" Altea. Fornire servizi operativi di ricerca per il territorio europeo (OPERA - colonna di servizi)
H4C4 Copernicus Application Engineering for Professional Surveyors	2	*	OPERA	INIZIATA	2022-180.000 2023-180.000	360.000,00	84%	302.400,00	Finanziata a unico studente/ricercatore e sviluppo della ricerca per sviluppare servizi operativi. Sviluppo del servizio "Service" Altea. Fornire servizi operativi di ricerca per il territorio europeo (OPERA - colonna di servizi)
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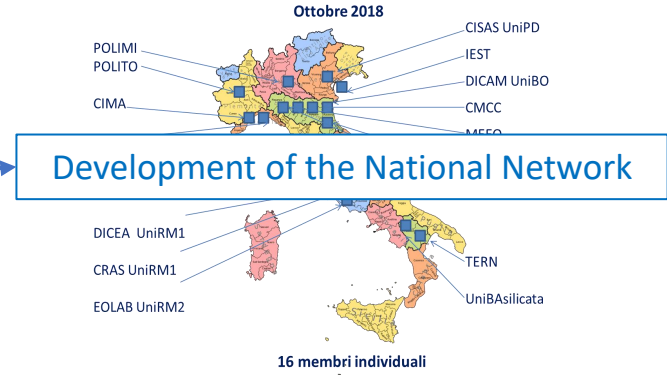
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ID	Type	WP/2020	Title	Partner	Priority	Original Budget	Totale	EU contribution	Descrizione
1	*	H2020	PhD Scholarship on Climate Change and Sustainable Development	GPRA	HUS	2020 - 45.000 2020 - 45.000 2020 - 45.000	135.000,00	84%	113.400,00
1	*	H2020	Disseminating Understanding and Learning OAS through Training (OUE-IT)	GPRA	HUS	2020 - 22.000 2020 - 13.000	35.000,00	84%	29.400,00
1	*	H2020	Copernicus/Space/Innovative in products, services, business and ICT services TRAINING	GPRA	SG	2020 - 77.000 2020 - 58.000 2020 - 53.200	188.200,00	84%	158.000,00
2	*	H2020	CAPES - Copernicus Applications for Professional Surveyors	UNIRM1 TOR VERGATA	HUS	2020 - 130.000 2020 - 130.000	260.000,00	84%	218.400,00
2	*	H2020	FAEC - Forecasting Applications Engineering	UNIRM1 TOR VERGATA	HUS	2020 - 140.000 2020 - 140.000	280.000,00	84%	235.200,00
2	*	H2020	Partner europeo guidato da GPRA con CSIP	GPRA	HUS	2020 - 200.000,00	200.000,00	84%	168.000,00
2	*	H2020	Attività di sensibilizzazione per i cittadini europei GPRA - in occasione di azioni	GPRA	HUS	2020 - 100.000,00	100.000,00	84%	84.000,00
2	*	H2020	Realizzazione per i servizi di disseminazione tecnologica e servizi di assistenza	GPRA	HUS	2020 - 100.000,00	100.000,00	84%	84.000,00



Promotion and implementation of "individual" events within the National Network



POSITION PAPER:

the role of the **National Copernicus Academy Network** in developing training pathways for the implementation of the **National Recovery and Resilience Plan**

In fact, the National Recovery and Resilience Plan (PNRR) manifests in a large part of its missions, as well as many other strategic programs promoted by the EU, the usefulness and necessity of the integrated use of EO, GGI and ICT methods and tools to produce high value-added, public utility and/or market information through particularly innovative infrastructure and operational services.

Methodology used to pursue this general objective:

A SURVEY AMONG THE MEMBERS OF THE NATIONAL NETWORK to know and assess which educational and training activities on OT, GGI and ICT exist at each of them and if what is produced by Copernicus, is used in these activities and therefore ...

... **DEFINITION** on the basis of the results of the previous **SURVEY** of a **UNIFIED ENSEMBLE OF EDUCATIONAL AND TRAINING ACTIVITIES**, shared and delivered jointly by the members of the Copernicus Academy National Network that, as far as possible, uses the **EDUCATIONAL ACTIVITIES ALREADY AVAILABLE**.

POSITION PAPER:

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The current individual educational offerings among Copernicus Academy members (2021):

308 teaching activities of which:
40 of Level I
164 of Level II
59 of Level III
45 unclassified

1514 University Course Credits

12868 hours of educational activities

Activities carried out by academic members:

- Università di Padova: 40
- Politecnico di Torino: 24
- Politecnico di Milano: 24
- Università di Roma "La Sapienza": 23
- Università di Bologna: 20
- Università di Firenze: 16
- Università di Pavia: 14
- Università di Perugia: 14
- Università della Basilicata: 13
- Università Politecnica delle Marche: 11

Activities carried out by non-academic members:

- GISIG: 29 (Association and activities developed within the EO4GEO project partnership)
- Istituto Nazionale di Oceanografia e Geofisica Sperimentale: 17 (Research Institute)
- Fondazione CIMA: 4 (Public Foundation)

POSITION PAPER:

the role of the **National Copernicus Academy Network** in developing training pathways for the implementation of the **National Recovery and Resilience Plan**

The current educational offer of Copernicus Academy members will be "reorganized " and " integrated " for the implementation purposes of the NRRP:

for the very short term:

Direct use of the **available educational offer**, harmonised and, as far as necessary and possible, supplemented through professionalising education and training activities also at a sub-regional scale, such as the **Copernicus GeoData and Satellite Facilities Open School**

for the short term:

Relying on the **available educational offer**, organisation and implementation of a 'homogeneously qualifying' **second-level national annual Master** for the integrated use of EO, GGI and ICT methods, tools and products, also through what is made available by Copernicus

for the medium term:

the design, organisation and implementation of a **new national three years PhD** in the subjects of EO, GGI and ICT with a focus on the integration and the integrated use of their components for the development of applications, methods and tools leading to the potential implementation of operational services.

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POSITION PAPER: The National Doctorate in Earth Observation (DNOT)



SAPIENZA
UNIVERSITÀ DI ROMA

Dottorato di ricerca nazionale in Osservazione della Terra

Goal

- Training of **professionals with:**
 - **integrated competences** on EO, GGI e ICT
 - **specific competences** on management, administration and law
- able to:
 - **scout potential users** and collect **their needs**
 - **promote existing and design new EO services** to satisfy users needs
 - **increase user competences**

for PA, companies e and research ecosystem benefits

Complementary General Goal

Participation in the development of a new EO Skills Strategy at the national and European level.



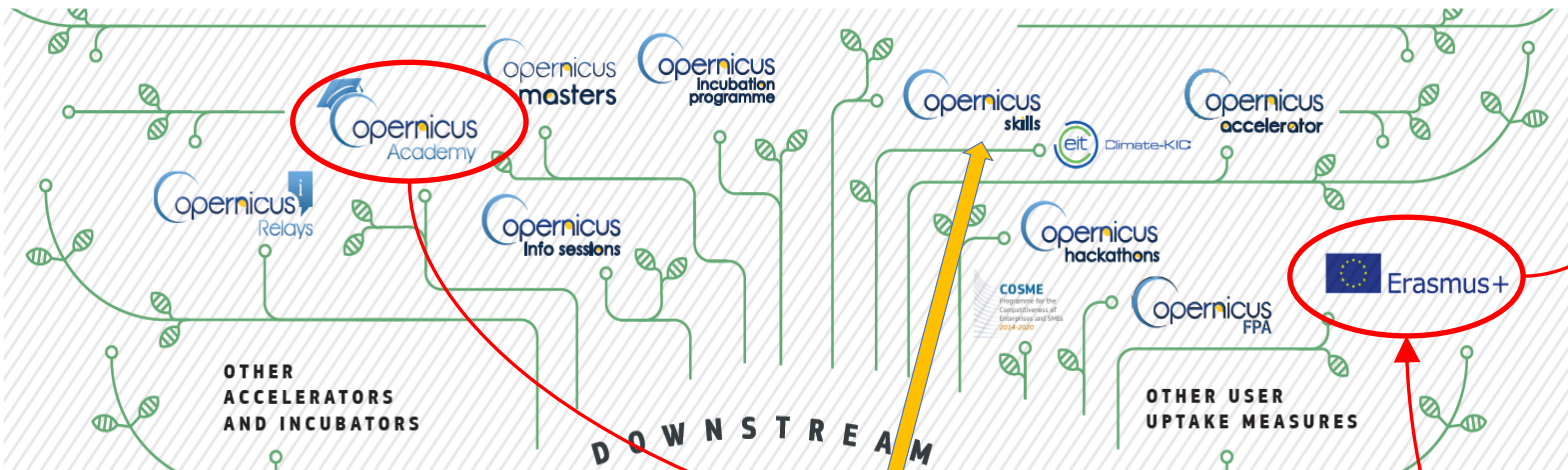
Starting point

The conception, design and promotion of the National PhD within the Network started already in May 2021, together with the preparation of the Position Paper

S-W-O

- Very good competences **in EO, GGI, ICT at national level**
- **Remarkable funds from PNRR** (EO, GGI, ICT key topics in 3 missions)
- Lack of a proper coordination, **needed to guarantee a structured and homogeneous training**
- Copernicus Academy network, **active at EU and national level since 2016 and 2018 respectively**

THE COPERNICUS ACADEMY NATIONAL NETWORK: the Development of new Skills in Earth Observation

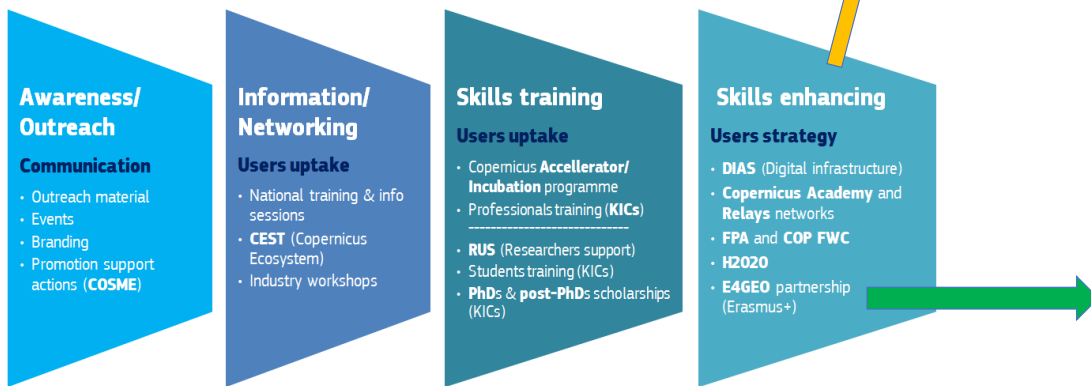


ERASMUS PLUS
SECTOR SKILLS ALLIANCE

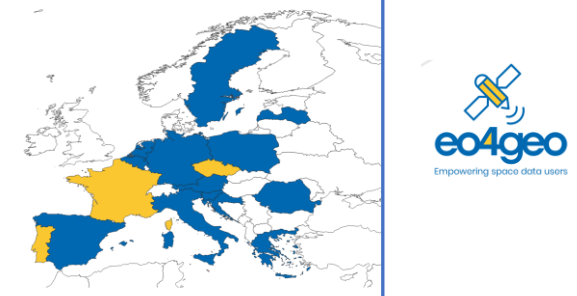
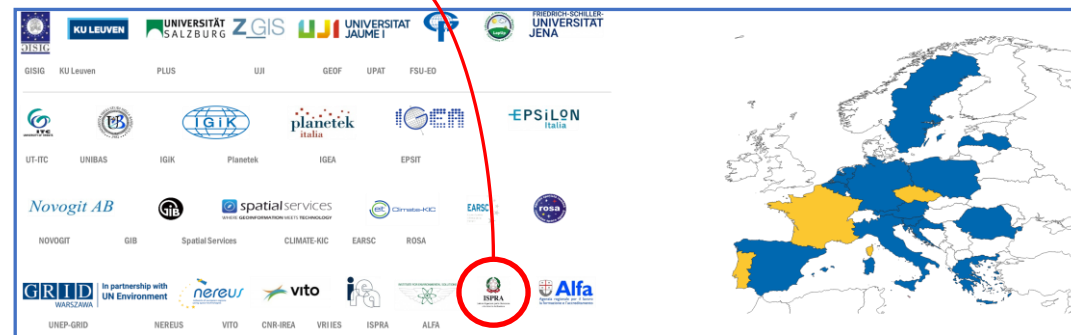
EO4GEO Project

Towards an innovative strategy for skills development and capacity building in the space geo-information sector supporting Copernicus User Uptake

Strategic axes for enhancing education and skills development through Copernicus



Participated by 26 Organizations and 22 Associate Partners, largely Copernicus Academy members, from 16 EU countries



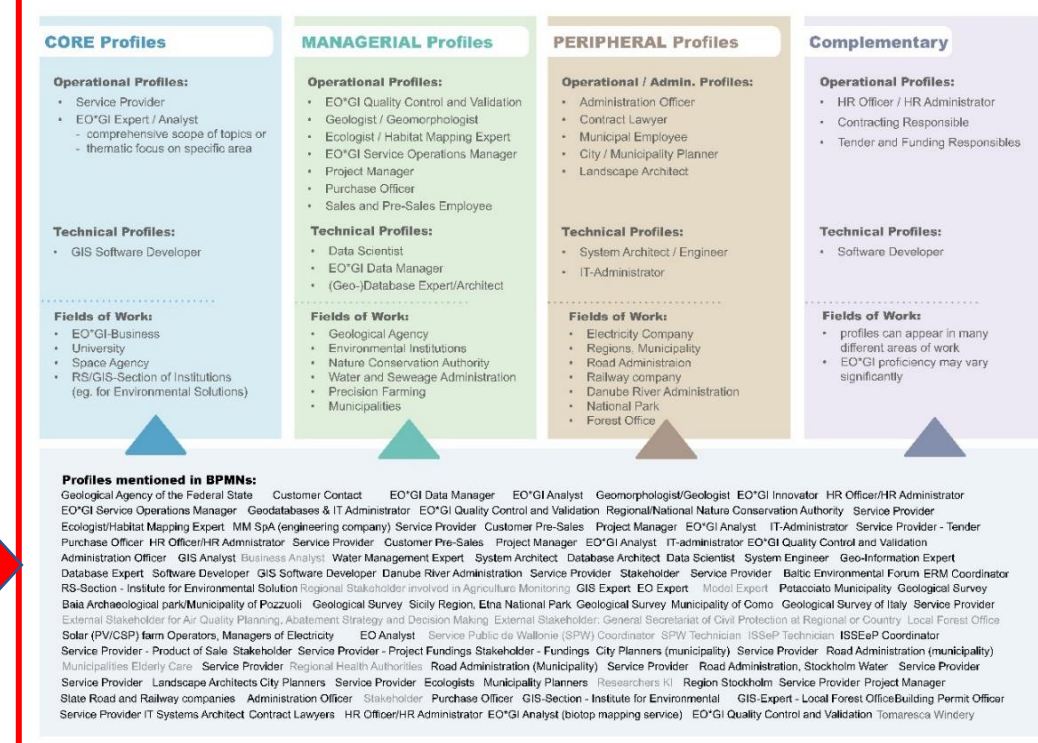
THE COPERNICUS ACADEMY NATIONAL NETWORK: the Development of new Skills in Earth Observation

Although the **EO4GEO Project** focused on only **three topics of interest to Copernicus**, those related to **Smart Cities, Climate Change** and some **Cross-cutting Applications**, aimed at natural and anthropogenic risk management, it identified as many as:

- ✓ **30 business processes**, "Business processes" (BPNM), found in both public and private sectors, in which EO/GI play a non-secondary role
- ✓ More than **200 EO/GI objectives**, "Tasks," both intermediate and final within these BPNMs
- ✓ More than **100 professional profiles of EO and GI**, largely to be innovated and thus summarized in **four categories of profiles**, starting from those fully involved and committed to the EO/GI objectives of the BPNMs, "CORE profiles" to those, including administrative ones, who only need to have an idea of the role of OT/GI in the BPNM, "Complementary profiles"



BPMNs OCCUPATIONAL PROFILES COVERING EO+GI-Tasks



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Position Paper:

The provision of training tools for the rapid qualification of professional profiles, related to the integrated use of OT, GGI and ICT methods and tools, advanced and necessary for the implementation of the innovative actions envisaged by the PNRR

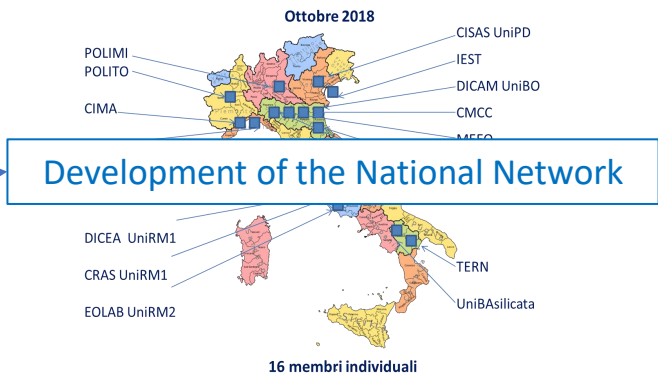
Promotion, development of "collective" tools and actions

Italian Consortium for Copernicus Academy:
To promote and disseminate the culture, knowledge of the fundamentals and use of advanced and innovative OT, GGI and ICT technologies, methods and tools related primarily to the European Copernicus Program and, particularly, within and for the purposes of its Copernicus Academy



"Aggregated" participation in calls for FPCUP WPs and other European educational and training programs.

Year	Type	WP/2020	Title	Partner	Priority	Original Budget	Totale	EU contribution	Descrizione
1	*		PhD scholarship on Climate Change and Sustainability/Management/Engineering	OPNA	ICIS	2022 - 45.000 2023 - 45.000 2024 - 45.000	153.000,00	84%	2 Serie di studi per PhD su: 1) qualità e clima e change
1	*		Processing, understanding and capturing GMI through Training (GMI-RT)	OPNA	ICIS	2023 - 22.000 2024 - 13.000	35.000,00	84%	Utilizzare risultati secondarie e primarie/PhD mirate con focus sul DMS per rafforzare i prodotti Copernicus. Prossimo Workshop: Alleanza con Copernicus e istituzioni reg
1	*		Copernicus/Quantitative on geodata, satellite, facilities and 3D wireless training	OPNA	IS4	2023 - 77.500 2024 - 58.000 2025 - 53.200	188.700,00	84%	218.490,00
2	*		CAPI - Copernicus Applications for Professional Careers	OPNA	UNIBSA TOR VIGEVANA	2022 - 130.000 2023 - 130.000	260.000,00	84%	158.840,00
2	*		HAEC Training Application Engineering	OPNA	UNIBSA TOR VIGEVANA	2023 - 180.000 2024 - 180.000	360.000,00	84%	171.240,00
								84%	205.800,00
								84%	223.490,00
								84%	180.000,00



Promotion and implementation of "individual" events within the National Network

THE COPERNICUS ACADEMY NATIONAL NETWORK: the Development of new Skills in Earth Observation

In order to give continuity to the action and results obtained through the **EO4GEO Project** and **enhance the existing activities within the National Network of Copernicus Academy** with respect to the **identification, construction and promotion of new professional profiles in EO**, not only in the academic sphere, but also in upper secondary education, in particular, vocational, it has been decided to accompany and support the action of GISIG by joining the **Pact for Skills** with the **Italian Consortium for the Copernicus Academy**.

The **Italian Consortium for Copernicus Academy** is a public purpose, non-profit consortium of public members of the Copernicus Academy



Pact for Skills commitments define how organisations **plan to take action for the upskilling and reskilling of people of working age**. Commitments are made by organisations and outline the concrete actions they will implement **to support the key principles of the Pact for Skills charter**:

- Promoting a culture of lifelong learning for all
- Building strong skills partnerships
- Monitoring skill supply/demand and anticipating skill needs
- Working against discrimination and for gender equality and equal opportunities

In conclusion, we can:

- ✓ say we know Copernicus if you think it is represented by its 3 components;
- ✓ make useful and effective use of all that it makes available if you understand the role that Geomatics and some its components such as Remote Sensing and Geoinformation play in Copernicus and you have any basic knowledge of these components;
- ✓ speak of Earth Observation services if the Geomatics approach present in Copernicus is integrated with the cognitive and methodological contributions, as well as products and services, made available by other thematic disciplines and operational areas, such as meteorology and climatology, bio, geo and social sciences, economics and many others ...

...and the European and national Copernicus Academy networks aim to fill these gaps and, through the dissemination of Copernicus, to accompany the development of new professional profiles also based on the use of EO and promote their availability on the labour market!



https://youtu.be/uzF_ftCeZ5Y

ISPRA
Cyprus University of Technology
DLR

SUMMER SCHOOL WORKSHOP
**ACTION 2020-2-21:
COPERNICUS
FOR CULTURAL HERITAGE**
13-16.06.2023



... Thanks !...