Cluster 4 "Digital, Industry and Space" Focus: Digital Emerging Technologies

APRE for all

APRE is a non-profit association.

APRE **serves the public** offering free-of-charge assistance to all actors of the Italian R&I system.

MISSION

Supporting and promoting the **Italian participation in the EU Framework Programmes** for Research and Innovation *through*

- Information
- Training
- Assistance

+150 APRE ASSOCIATED MEMBERS

APRE associated members share the mission of the Agency. They are among the most important Italian representatives from the **public and the private R&I sector**, and they come from:

- **University and Research**
- **Industry**
- **Parks and Scientific & Technological Districts**
- **Public Administration**
- **Associative and chamber system**
- **Finance**

APRE Thematic teams offer free-of-charge assistance on:

- ⬈ **Participation in the Framework Programmes' calls**

- ⬈ **Administrative, contractual and reporting procedures**

- ⬈ **Sub-programmes (objectives and policies)**

- ⬈ **Financial instruments**

- ⬈ **Proposal preparation (template and proposal interpretation)**

- ⬈ **Partner search at national and international level**

A NETWORK OF OPPORTUNITIES

APRE works to increase opportunities for collaboration between:

- Researchers and research organizations

- Italian innovators

- National institutions

- European partners

- Non-European partners

- Associated and non-Associated Countries to the Framework Programme
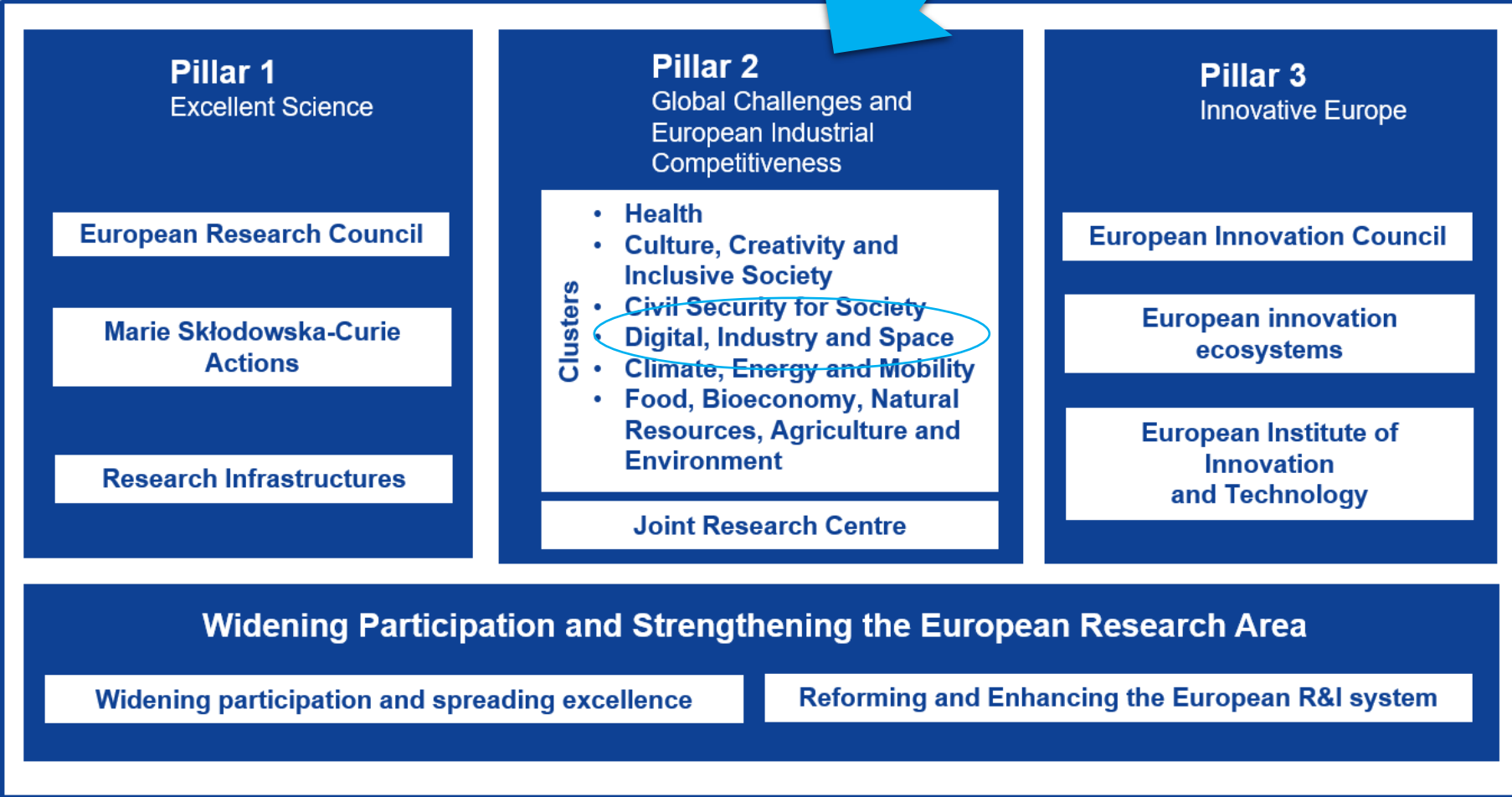
WHERE WE ARE

ROME
Headquarters

BRUXELLES
EU Liaison Office

Through the EU Liaison Office in Brussels, APRE acts in close contact with the EU institutions and other key players of the EU decision-making process, promoting a strengthened engagement of its members and the Italian R&I community in the EU policies and programmes.

Digital, Industry and Space

CL4: Digital, Industry and Space - Objectives

- Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres)

- Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials

- Sovereignty in digital technologies and in future emerging enabling technologies by strengthening European capacities in key parts of digital and future supply chains

- Globally attractive, secure and dynamic data-agile economy by developing and enabling the uptake of the next-generation computing and data technologies and infrastructures (including space infrastructure and data)

- Strategic autonomy in conceiving, developing, deploying and using global space-based infrastructures, services, applications and data

- A human-centred and ethical development of digital and industrial technologies

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CLUSTER 4 – AREAS OF INTERVENTION

2021-2027

DIGITAL

- Key Digital Technologies
- AI and Robotics
- NGI
- Advanced Computing and Big Data

INDUSTRY

- Manufacturing
- Advanced materials
- Circular industry
- Low carbon and clean industry

SPACE

- A globally competitive Space sector
- New services from Space

Emerging enabling technologies: Graphene, Quantum Technologies, spintronics, smart materials

Cluster 4 - Policy Framework

Recovery plan for Europe

GREEN DEAL

A EUROPE FIT FOR THE DIGITAL AGE

European Industrial Strategy

A New Circular Economy Action Plan

ZERO POLLUTION AMBITION

Action Plan on Critical Raw Materials
#EUGreenDeal
#EUIndustrialStrategy

THE EU TAXONOMY

THE EUROPEAN DATA STRATEGY
#DigitalEU

EU Cyber Security Strategy

MATERIALS 2030 MANIFESTO
Systemic Approach of Advanced Materials for Prosperity – A 2030 Perspective

EU 'Fit For 55' Package

EU Chemicals Strategy for Sustainability

2030 DIGITAL COMPASS
THE EUROPEAN WAY FOR THE DIGITAL DECADE
#DigitalEU

AI ARTIFICIAL INTELLIGENCE EXCELLENCE & TRUST

SPACE STRATEGY FOR EUROPE
#EUSpaceStrategy

The European Chips Act
#DigitalEU #EUChipsAct

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Cluster 4 Complementarities – European Partnerships

DID YOU KNOW?

European Partnerships are initiatives where the EU, together with private and public partners, commit to jointly support the development and implementation of a programme of research and innovation activities. The partners could represent industry, universities, research organisations, bodies with a public service remit at local, regional, national or international level or civil society organisations, including foundations and NGOs. Partnerships are not new – they were first introduced in 2002 as part of the European Research Area to overcome fragmentation of research effort.

3 Istitutional partnerships (Art.187, Public-Private)
EuroHPC JU
Key Digital Technologies JU (ex ECSEL JU)
Smart Networks and Services JU (ex 5G PPP)

Call opened!

7 Co-programmed partnerships
Made in Europe (ex FoF)
Process4Planet - Carbon neutral Circular Industry
Clean steel (ex SPIRE)
AI, Data and Robotics
Photonics
Globally competitive Space Systems (Proposed 2023)

1 Istitutional partnership (Art. 185, Public-Public)
European Partnership on Metrology

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Work Programme 2023

Cluster 4 – Work Programme 2023-24 Overview

D1 - Climate neutral, circular and digitized production
TWIN-TRANSITION

- Manufacturing Industry
- A New Way to Build, accelerating disruptive change in construction
- Energy Intensive Process Industries

D2 - Increased autonomy in key strategic value chains for resilient industry
RESILIENCE

- Raw Materials for strategic autonomy and circular economy
- Safe and Sustainable by Design Chemicals and Materials
- Strategic Innovation Markets Driven by Advanced Materials
- Improving the resilience of EU businesses

D3 - World leading data and computing technologies
DATA

- Data sharing and analytics capacity
- From Cloud to Edge to IoT

D4 - Digital and emerging technologies for competitiveness and fir for the Green Deal
DIGITAL-EMERGING

- Open Source for Cloud/Edge Digital Autonomy
- Photonics
- AI, data and robotics
- Graphene
- Quantum
- Emerging Techs

D5 - Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data
SPACE

- Competitiveness
- Access to Space
- Galileo, EGNOS and Copernicus, PRS and GOVSATCOM
- Copernicus service
- Galileo and EGNOS
- SSA, GOVSATCOM , Quantum
- CASSINI & Space entrepreneurship

D6 - A human-centred and ethical development of digital and industrial technologies
HUMAN

- AI based on trust
- Internet of Trust
- Extended Reality
- Accelerating uptake of tech & innovation
- Industry 5.0
- Standardization
- Digital Humanism

Energy efficiency and climate neutral process industries
Circularity and Zero Pollution in process industry
Clean Steel

Other Actions: NGI commons; Critical Raw Materials Exploration Investment Facility; UNECE resource management system; JRC & Action Plan on Critical Raw Materials; Raw Materials events; Support to Hydrogen

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CLUSTER 4 | Overview Work Programme 2023 –24

Deadlines		
'23	28 e 29 March+20 April	
'24	7 e 20 Feb + 19 March	

Topic	
'23	88
'24	42
	130

Budget	
'23	1390,23
'24	927
	2317,23

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2023 | Specific conditions/elegibility criteria
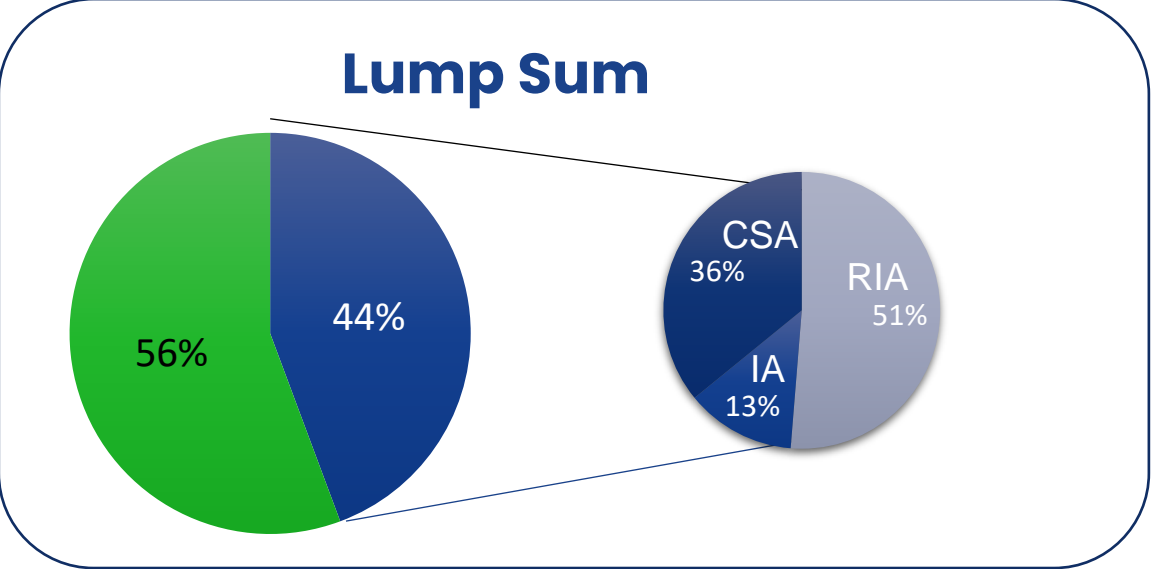
Blind evaluation (two-stage)

4 topics in destination 6 with **FSTP**

ART 22.5
- Limited participation in 6 out of 16 topics in destination 5
- Limited participation in 3 out of 14 topics in destination 4

COLLABORATIONS (17 topics)
- International Cooperation: 10 topics
- Collaboration with JRC: 3 topics
- Collaboration with EIT: 4 topics

Lump Sum

56% 44%

CSA 36% RIA 51% IA 13%

Destination 4: Digital & Emerging Technologies for Competitiveness and Fit for the Green Deal

⌐ This destination will directly support the following Key Strategic Orientations, as outlined in the Strategic Plan:

1. KSO A, '**Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains** to accelerate and steer the digital and green transitions through human-centred technologies and innovations.'

2. KSO C, '**Making Europe the first digitally led circular, climate-neutral and sustainable economy** through the transformation of its mobility, energy, construction and production systems

Proposals for topics under this Destination should set out a credible pathway to contributing to the following expected impact:

1. **Open strategic autonomy in digital technologies and in future emerging enabling technologies**, by strengthening European capacities in key parts of digital and future supply chains, allowing agile responses to urgent needs, and by investing in early discovery and industrial uptake of new technologies.

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Call - HORIZON-CL4-2023-DIGITAL-EMERGING-01 Opening: 01 Dec 2022   - Deadline(s): 29 Mar 2023

Topics	Type of Action	Budgets	EU contribution per project	N° of projects	Topic features
HORIZON-CL4-2023-DIGITAL-EMERGING-01-01 Novel paradigms and approaches, towards AI-driven autonomous robots (AI, data and robotics partnership)	RIA	30.00	Around 8.00	4	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-12 Adaptive multi-scale modelling and characterisation suites from lab to production	RIA	22.00	5.00 to 7.00	4	AI, Data and Robotics
HORIZON-CL4-2023-DIGITAL-EMERGING-01-51 Pervasive photonics - multi-technology integration for digital infrastructure, sensors and internet of things (Photonics partnership)	RIA	18.00	3.00 to 5.00	4	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-53 Versatile light sources and systems as tools for manufacturing and medical application (Photonics Partnership)	RIA	18.00	3.00 to 5.00	4	**Lump sum**
HORIZON-CL4-2023-DIGITAL-EMERGING-01-57 Advanced imaging and sensing technologies (IA)(Photonics Partnership)	IA	20.00	5.00 to 7.00	4	**Lump sum**
budget		108.00			European Innovation Leadership in Photonics

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Call - HORIZON-CL4-2023-DIGITAL-EMERGING-01-CNECT Opening:1 Dec 2022 - Deadline(s): 29 Mar 2023

Topics	Type of Action	Budgets	EU contribution per project	N°of projects	Topic features
HORIZON-CL4-2023-DIGITAL-EMERGING-01-02 Industrial leadership in AI, Data and Robotics – advanced human robot interaction (AI Data and Robotics Partnership)	IA	30.00	Around 10.00	3	AI, Data and Roboti
HORIZON-CL4-2023-DIGITAL-EMERGING-01-11 Low TRL research in micro-electronics and integration technologies for industrial solutions	RIA	35.00	3.00 to 4.00	10	Int coop European Leadership in Emerging and Enab Technologies
HORIZON-CL4-2023-DIGITAL-EMERGING-01-32 Sustainable safe-by-design 2D materials technology	RIA	6.00	3.00 to 5.00	2	Lump sum
HORIZON-CL4-2023-DIGITAL-EMERGING-01-33 2D materials of tomorrow	RIA	12.00	3.00 to 4.00	3	Graphene and 2D materials: Europe in the

Call - HORIZON-CL4-2023-DIGITAL-EMERGING-01-CNECT Opening:1 Dec 2022 - Deadline(s): 29 Mar 2023

Topics	Type of Action	Budgets	EU contribution per project	N° of projects	Topic features
HORIZON-CL4-2023-DIGITAL-EMERGING-01-40 Quantum Photonic Integrated Circuit technologies	RIA	12.00	4.00 to 6.00	2	EU-r Lump sum
HORIZON-CL4-2023-DIGITAL-EMERGING-01-41 Investing in alternative quantum computation and simulation platform technologies	RIA	20.00	7.00 to 12.00	2	EU-r
HORIZON-CL4-2023-DIGITAL-EMERGING-01-43 Framework Partnership Agreement for developing large-scale quantum Computing platform technologies	FPA	0	0	0	EU-r
HORIZON-CL4-2023-DIGITAL-EMERGING-01-50 Next generation quantum sensing and metrology technologies	RIA	10.00	2.00 to 3.00	3	Flagship on Quantum Technologies: a Paradigm Shift
HORIZON-CL4-2023-DIGITAL-EMERGING-01-56 Photonic Strategies and Skills Development (CSA) (Photonics Partnership)	CSA	4,00	1,00 to 3,00	2	
Overall budget		129.00			European Innovation Leadership in Photonics

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HORIZON-CL4-2024-DIGITAL-EMERGING-01-21: Open Source for Cloud/Edge to support European Digital Autonomy

Proposals should facilitate the emergence of a full **European Open Cloud and Edge Computing Architecture** by:

- Developing **open source alternatives** to enable the physical use of **emerging processors in cloud and edge server systems**. Such modules include basic input/output systems, pre-boot execution environments, power-on authentication, etc., supporting heterogeneous processor architectures, and

- Demonstrating actual **cloud and edge systems in real life** or emulated computing environments exploiting the benefits of an extended open source stack (socket to application) on emerging processor architectures (e.g. RISC-V).

Proposals are expected to develop synergies and relate to activities and outcomes of the **KDT/Chips** and the EuroHPC Joint Undertakings, the European Processor Initiative and the European RISC-V working group

HORIZON-CL4-2024-DIGITAL-EMERGING-01-31: Pilot line(s) for 2D materials-based devices

- Proposals shall continue the efforts started in the 2D experimental Pilot Line of the Graphene Flagship and build on the IP developed therein, to **establish a 2DM pilot line**(s),

- Proposals should focus on the **(co-)integration of 2DM with established technologies such as CMOS269 integration and heterogeneous integration**.

- Proposal should include supply of standard semiconductor technologies such as CMOS, ASICs270, planarized waveguides already adapted/optimized for 2DM co-integration.

- Proposals should specify targeted added value(s) against current technologies of the integrated devices and systems.

Projects are expected to develop synergies and relate to activities and outcomes of the projects selected under the other topics of 'Graphene and 2D materials: Europe in the lead' and where relevant of the **KDT JU**

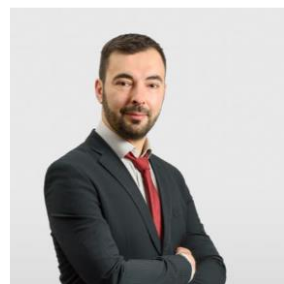## HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

- Proposals should target up-take and up-scaling of emerging **EU-driven smart industrial internet of things and edge computing systems to perform under real life conditions**, as to mature particular technologies like meta-operating systems for the IoT and the Edge, cognitive cloud technologies and tools for decentralized intelligence and swarm computing for adoption across key applications and sectors crucial for Europe's competitiveness and open strategic autonomy.

- Pilots are to implement and demonstrate mature solutions, on technology integration such as sensors, actuators, distributed control, connectivity and edge computing and embedded reasoning to **demonstrate security, resilience and autonomy of system with low data processing latency for analytics and AI-inference and decentralised intelligence at the edge**.

- Projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms such as **KDT JU**, GAIA-X, et al.

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APRE TEAM «Digital, Industry and Space

Serena Borgna
borgna@apre.it

Diego Coglitore
coglitore@apre.it

Valentina Fioroni
fioroni@apre.it
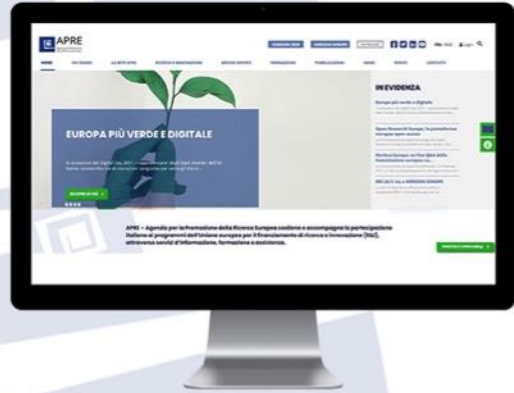
Claudio Testani
testani@apre.it

cluster4@apre.it

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