



Cluster 4: Digital, Industry and Space

Dr Sergio Fernandez-Ceballos | March 2021



**HORIZON
EUROPE**



THE EU RESEARCH & INNOVATION
PROGRAMME 2021 - 2027

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An Roinn Breiseoidéachais agus Ardoideachais,
Taighde, Nuálaíochta agus Eolaíochta
Department of Further and Higher Education,
Research, Innovation and Science





Cluster 4 Digital, Industry & Space

Industry →

- Destination 1 - Climate neutral, circular and digitised production

Industry →

- Destination 2 - Increased autonomy in key strategic value chains for resilient industry

Digital →

- Destination 3 - World leading data and computing technologies

Digital →

- Destination 4 - Digital and emerging technologies for competitiveness and fit for the green deal

Space →

- Destination 5 - Open strategic autonomy in developing, deploying and using global space-based infrastructures, services and data

Digital →

- Destination 6 - A human-centred and ethical development of digital and industrial technologies





Cluster 4 Digital, Industry & Space

Destination 1 – Climate neutral, circular and digitised production

Green, flexible and advanced manufacturing

Zero defect manufacturing, 3D printing, biomaterials, sustainable production, modular manufacturing

Advanced Digital Technologies for Manufacturing

Digital tools to support engineering, AI for manufacturing

A New Way to Build, accelerating disruptive change in construction

Digitalisation of the construction sector, BIM, valorisation of construction waste

Hubs for circularity and circularity in industry AND Enabling circularity of resources in the process industries, including waste and CO₂/CO -

Demonstrators for the utilisation of energy, waste industrial water, plastic waste, raw materials and biomass

Integration of Renewables and Electrification in process industry –

Electrochemical conversion routes for the production of chemicals and materials in the process industries, Hydrogen to replace fossil fuels, Steel production

Destination 2 - A digitised, resource-efficient and resilient industry

Raw materials for EU strategic autonomy and successful transition to a climate-neutral and circular economy

Exploration, mining, processing, recycling

Green and Sustainable Materials

Safe and sustainable by design, multi functional materials, coatings, polymeric/lightweight materials, recycled plastics

Materials for the benefit of Society, Environment and De-carbonising Industry

Antiviral and antimicrobial coatings, materials for hydrogen storage, membranes, biomaterials for health and energy applications, composite materials

Materials & Data Cross cutting actions (Materials Modelling & Characterization)

Improving the resilience of EU businesses

Standards and regulatory issues



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Destination 3 - World Leading Data And Computing Technologies

Data sharing in the common European data space

Green and responsible data operations, data management, extreme data mining, data trading

Strengthening Europe's data analytics capacity

Methods for exploiting data/knowledge for extremely precise outcomes (analysis, prediction, decision support)

High-end computing for exascale performance and beyond

Supercomputing technology (hardware and software), separate EuroHPC partnership

From Cloud to Edge to IoT for European Data

Meta operating systems, 'cloud-edge-IoT', next generation computing/systems technologies, AI-enabled computing continuum cloud to edge, programming tools

Destination 4 - Digital and emerging technologies for competitiveness and fit for the green deal

Ultra-low power processors Secure processors, HW/SW, edge computing

European Innovation Leadership in Electronics

Components and system integration, separate KDT partnership

European Innovation Leadership in Photonics

Communications, PICs, sensing

6G and foundational connectivity technologies

Separate SNS partnership

Innovation in AI, data and robotics Green Deal, workplace, industry

Tomorrow's deployable Robots Cognition, Network of Excellence, performance, intelligence, capabilities

European Leadership in Emerging Enabling Technologies

Spintronics, bio-intelligent manufacturing, nanomaterials characterisation

Quantum: A technology paradigm shift Materials and devices

Graphene – Europe in the lead Computing, simulation, sensing



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Destination 5 – Space 2021

Strategic Autonomy in Developing, Deploying and Using Global Space-Based Infrastructures, Services, Applications and Data 2021

End-to-end comms, Future space ecosystems, Re-useability of launchers, Low cost high thrust propulsion, New space transportation solutions, Copernicus Services Evolution, GOVSATCOM, Quantum for gravimetry

Space technologies for European non-dependence and competitiveness

RF, Passive components, discrete power devices, applications of metallic lead, Very high energy ion accelerators

Scientific exploitation of space data

Strategic Autonomy in Developing, Deploying and Using Global Space-Based Infrastructures, Services, Applications and Data 2021 - Applications

Applications fostering Green Deal, Safety and Crisis Management, applications for Digital Age

Destination 6 - A human-centred and ethical development of digital and industrial technologies

Leadership in AI based on trust

Trustworthy AI, tackling biases & disinformation in AI, human empowerment, AI Excellence Centres

An Internet of Trust

Trustworthy search and discovery, community building, International collaboration, internet architectures, safer internet

Extended reality

Haptics, accessibility, collaborative telepresence, new media, smart learning

Systemic approaches to make the most of the technologies within society and industry

IP, standardisation, STARTs, skills



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Irish National Contact Points (NCP's) for Cluster 4

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Upcoming Events: Cluster 4

Cluster 4 National Information Day (TBC)

Cluster 4 EC organised Information Days (TBC)

Documentation

Cluster 4 work programme - launch mid April

Proposal template – https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf

C4 Candidate Partnerships - https://ec.europa.eu/info/horizon-europe/european-partnerships-horizon-europe/candidates-digital-industry-and-space_en