

ERC DOMAIN

ANNEX 9



**Ministry of University and Research
Directorate-General for Internationalisation and Communication**

**Public notice for the submission of project proposals to be funded
under the National Recovery and Resilience Plan (NRRP)**

**Mission 4, “Education and Research” - Component 2, “From Research to Business” -
Investment line 1.2, “Funding projects presented by young researchers”,
funded by the European Union - NextGenerationEU**

Annex 9 – ERC Domains¹

Domain: Physical Sciences and Engineering

Primary Sector: PE1 Mathematics

Keywords:

PE1_1 Logic and foundations
PE1_2 Algebra
PE1_3 Number theory
PE1_4 Algebraic and complex geometry
PE1_5 Lie groups, Lie algebras
PE1_6 Geometry and global analysis
PE1_7 Topology
PE1_8 Analysis
PE1_9 Operator algebras and functional analysis
PE1_10 ODE and dynamical systems
PE1_11 Theoretical aspects of partial differential equations
PE1_12 Mathematical physics
PE1_13 Probability
PE1_14 Mathematical statistics
PE1_15 Generic statistical methodology and modelling
PE1_16 Discrete mathematics and combinatorics
PE1_17 Mathematical aspects of computer science
PE1_18 Numerical analysis
PE1_19 Scientific computing and data processing
PE1_20 Control theory, optimisation and operational research
PE1_21 Application of mathematics in sciences
PE1_22 Application of mathematics in industry and society

Primary Sector: PE2 Fundamental Constituents of Matter

Keywords:

PE2_1 Theory of fundamental interactions
PE2_2 Phenomenology of fundamental interactions

¹ I domains, primary sectors e keywords individuati ai fini del presente Avviso sono ripresi dall'Annex “ERC EVALUATION PANELS AND KEYWORDS” dell'Information for Applicants to the Starting and Consolidator Grant Calls (2025)

PE2_3 Experimental particle physics with accelerators
 PE2_4 Experimental particle physics without accelerators
 PE2_5 Classical and quantum physics of gravitational interactions
 PE2_6 Nuclear, hadron and heavy ion physics
 PE2_7 Nuclear and particle astrophysics
 PE2_8 Gas and plasma physics
 PE2_9 Electromagnetism
 PE2_10 Atomic, molecular physics
 PE2_11 Ultra-cold atoms and molecules
 PE2_12 Optics, non-linear optics and nano-optics
 PE2_13 Quantum optics and quantum information
 PE2_14 Lasers, ultra-short lasers and laser physics
 PE2_15 Thermodynamics
 PE2_16 Non-linear physics
 PE2_17 Metrology and measurement
 PE2_18 Equilibrium and non-equilibrium statistical mechanics: steady states and dynamics

Primary Sector: **PE3** Condensed Matter Physics

Keywords:

PE3_1 Structure of solids, material growth and characterisation
 PE3_2 Mechanical and acoustical properties of condensed matter, lattice dynamics
 PE3_3 Transport properties of condensed matter
 PE3_4 Electronic properties of materials, surfaces, interfaces, nanostructures
 PE3_5 Physical properties of semiconductors and insulators
 PE3_6 Macroscopic quantum phenomena, e.g. superconductivity, superfluidity, quantum Hall effect
 PE3_7 Spintronics
 PE3_8 Magnetism and strongly correlated systems
 PE3_9 Condensed matter – beam interactions (photons, electrons, etc.)
 PE3_10 Nanophysics, e.g. nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics
 PE3_11 Mesoscopic quantum physics and solid-state quantum technologies
 PE3_12 Molecular electronics
 PE3_13 Structure and dynamics of disordered systems, e.g. soft matter (gels, colloids, liquid crystals), granular matter, liquids, glasses, defects
 PE3_14 Fluid dynamics (physics)
 PE3_15 Statistical physics: phase transitions, condensed matter systems, models of complex systems, interdisciplinary applications
 PE3_16 Physics of biological systems

Primary Sector: **PE4** Physical and Analytical Chemical Sciences

Keywords:

PE4_1 Physical chemistry
 PE4_2 Spectroscopic and spectrometric techniques
 PE4_3 Molecular architecture and Structure
 PE4_4 Surface science and nanostructures
 PE4_5 Analytical chemistry
 PE4_6 Chemical physics
 PE4_7 Chemical instrumentation
 PE4_8 Electrochemistry, electrodialysis, microfluidics, sensors
 PE4_9 Method development in chemistry
 PE4_10 Heterogeneous catalysis
 PE4_11 Physical chemistry of biological systems
 PE4_12 Chemical reactions: mechanisms, dynamics, kinetics and catalytic reactions
 PE4_13 Theoretical and computational chemistry

PE4_14 Radiation and Nuclear chemistry
PE4_15 Photochemistry
PE4_16 Corrosion
PE4_17 Characterisation methods of materials
PE4_18 Environment chemistry

Primary Sector: PE5 Synthetic Chemistry and Materials

Keywords:

PE5_1 Structural properties of materials
PE5_2 Solid state materials chemistry
PE5_3 Surface modification
PE5_4 Thin films
PE5_5 Ionic liquids
PE5_6 New materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles
PE5_7 Biomaterials synthesis
PE5_8 Intelligent materials synthesis – self assembled materials
PE5_9 Coordination chemistry
PE5_10 Colloid chemistry
PE5_11 Biological chemistry and chemical biology
PE5_12 Chemistry of condensed matter
PE5_13 Homogeneous catalysis
PE5_14 Macromolecular chemistry
PE5_15 Polymer chemistry
PE5_16 Supramolecular chemistry
PE5_17 Organic chemistry
PE5_18 Medicinal chemistry

Primary Sector: PE6 Computer Science and Informatics

Keywords:

PE6_1 Computer architecture, high-performance computing, real-time and embedded systems
PE6_2 Operating and distributed systems, computer networks and performance evaluation, mobile computing
PE6_3 Software engineering, programming languages
PE6_4 Theory of computation, semantics of computation, formal methods
PE6_5 Algorithms, complexity theory, algorithmic game theory and computational economics
PE6_6 Security, privacy, cryptology
PE6_7 Databases, web and information systems, information retrieval
PE6_8 Artificial intelligence, autonomous agents, knowledge representation
PE6_9 Machine learning, statistical data processing, computing with artificial neural networks
PE6_10 Natural language processing, large language and other foundation models
PE6_11 Computer vision, computer graphics, visualization
PE6_12 Human computer interaction, multimedia and virtual reality, computer games
PE6_13 Numerical and scientific computing, computational modelling and simulation methods, bioinformatics
PE6_14 New computational paradigms, quantum computing, bio-inspired computing

Primary Sector: PE7 Systems and Communication Engineering

Keywords:

PE7_1 Control engineering
PE7_2 Electrical engineering: power components and/or systems
PE7_3 Simulation engineering and modelling
PE7_4 (Micro- and nano-) systems engineering
PE7_5 (Micro- and nano-) electronic, optoelectronic and photonic components

PE7_6 Communication systems, wireless technology, high-frequency technology
PE7_7 Signal processing
PE7_8 Networks, e.g. communication networks and nodes, Internet of Things, sensor networks, networks of robots
PE7_9 Man-machine interfaces
PE7_10 Robotics
PE7_11 Components and systems for applications (in e.g. medicine, biology, environment)
PE7_12 Electrical energy production, distribution, applications

Primary Sector: PE8 Products and Processes Engineering

Keywords:

PE8_1 Aerospace engineering
PE8_2 Chemical engineering, technical chemistry
PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics
PE8_4 Computational engineering
PE8_5 Fluid mechanics
PE8_6 Energy processes engineering
PE8_7 Mechanical engineering
PE8_8 Propulsion engineering, e.g. hydraulic, turbo, piston, hybrid engines
PE8_9 Production technology, process engineering
PE8_10 Manufacturing engineering and industrial design
PE8_11 Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage
PE8_12 Naval/marine engineering
PE8_13 Automotive and rail engineering; multi-/inter-modal transport engineering

Primary Sector: PE9 Universe Sciences

Keywords:

PE9_1 Solar physics – the Sun and the heliosphere
PE9_2 Solar system science
PE9_3 Exoplanetary science, formation and characterization of extrasolar planets
PE9_4 Astrobiology
PE9_5 Interstellar medium and star formation
PE9_6 Stars – stellar physics, stellar systems
PE9_7 The Milky Way
PE9_8 Galaxies – formation, evolution, clusters
PE9_9 Cosmology and large-scale structure, dark matter, dark energy
PE9_10 Relativistic astrophysics and compact objects
PE9_11 Gravitational wave astronomy
PE9_12 High-energy and particle astronomy
PE9_13 Astronomical instrumentation and data, e.g. telescopes, detectors, techniques, archives, analyses

Primary Sector: PE10 Earth System Science

Keywords:

PE10_1 Atmospheric chemistry, atmospheric composition, air pollution
PE10_2 Meteorology, atmospheric physics and dynamics
PE10_3 Climatology and climate change
PE10_4 Terrestrial ecology, land cover change
PE10_5 Geology, tectonics, volcanology
PE10_6 Palaeoclimatology, palaeoecology
PE10_7 Physics of earth's interior, seismology, geodynamics
PE10_8 Oceanography (physical, chemical, biological, geological)
PE10_9 Biogeochemistry, biogeochemical cycles, environmental chemistry
PE10_10 Mineralogy, petrology, igneous petrology, metamorphic petrology

PE10_11 Geochemistry, cosmochemistry, crystal chemistry, isotope geochemistry, thermodynamics
PE10_12 Sedimentology, soil science, palaeontology, earth evolution
PE10_13 Physical geography, geomorphology
PE10_14 Earth observations from space/remote sensing
PE10_15 Geomagnetism, palaeomagnetism
PE10_16 Ozone, upper atmosphere, ionosphere
PE10_17 Hydrology, hydrogeology, engineering and environmental geology, water and soil pollution
PE10_18 Cryosphere, dynamics of snow and ice cover, sea ice, permafrosts and ice sheets
PE10_19 Planetary geology and geophysics
PE10_20 Geohazards
PE10_21 Earth system modelling and interactions

Primary Sector: PE11 Materials Engineering

Keywords:

PE11_1 Engineering of biomaterials, biomimetic, bioinspired and bio-enabled materials
PE11_2 Engineering of metals and alloys
PE11_3 Engineering of ceramics and glasses
PE11_4 Engineering of polymers and plastics
PE11_5 Engineering of composites and hybrid materials
PE11_6 Engineering of carbon materials
PE11_7 Engineering of metal oxides
PE11_8 Engineering of alternative established or emergent materials
PE11_9 Nanomaterials engineering, e.g. nanoparticles, nanoporous materials, 1D & 2D nanomaterials
PE11_10 Soft materials engineering, e.g. gels, foams, colloids
PE11_11 Porous materials engineering, e.g. covalent-organic, metal-organic, porous aromatic frameworks
PE11_12 Semi-conducting and magnetic materials engineering
PE11_13 Metamaterials engineering
PE11_14 Computational methods for materials engineering

Domain: Life Sciences

Primary Sector: LS1 Molecules of Life: Biological Mechanisms, Structures and Functions

Keywords:

LS1_1 Macromolecular complexes including interactions involving nucleic acids, proteins, lipids and carbohydrates
LS1_2 Biochemistry
LS1_3 DNA and RNA biology
LS1_4 Protein biology
LS1_5 Lipid biology
LS1_6 Glycobiology
LS1_7 Molecular biophysics, biomechanics, bioenergetics
LS1_8 Structural biology
LS1_9 Molecular mechanisms of signalling processes
LS1_10 Synthetic biology
LS1_11 Chemical biology
LS1_12 Protein design
LS1_13 Early translational research and drug design
LS1_14 Innovative methods and modelling in molecular, structural and synthetic biology

Primary Sector: LS2 Integrative Biology: from Genes and Genomes to Systems

Keywords:

LS2_1 Genetics

LS2_2 Gene editing
LS2_3 Epigenetics
LS2_4 Gene regulation
LS2_5 Genomics
LS2_6 Metagenomics
LS2_7 Transcriptomics
LS2_8 Proteomics
LS2_9 Metabolomics
LS2_10 Glycomics/Lipidomics
LS2_11 Bioinformatics and computational biology
LS2_12 Biostatistics
LS2_13 Systems biology
LS2_14 Genetic diseases
LS2_15 Integrative biology for personalised medicine
LS2_16 Innovative methods and modelling in integrative biology
LS3 Cellular, Developmental and Regenerative Biology

Primary Sector: LS3 Cell Biology, Development, Stem Cells and Regeneration

Keywords:

LS3_1 Cell cycle, cell division and growth
LS3_2 Cell senescence, cell death, autophagy, cell ageing
LS3_3 Cell behaviour, including control of cell shape, cell migration
LS3_4 Cell junctions, cell adhesion, the extracellular matrix, cell communication
LS3_5 Cell signalling and signal transduction, exosome biology
LS3_6 Organelle biology and trafficking
LS3_7 Mechanobiology of cells, tissues and organs
LS3_8 Embryogenesis, pattern formation, morphogenesis
LS3_9 Cell differentiation, formation of tissues and organs
LS3_10 Developmental genetics
LS3_11 Evolution of developmental strategies
LS3_12 Organoids
LS3_13 Stem cells
LS3_14 Regeneration
LS3_15 Development of cell-based therapeutic approaches for tissue regeneration
LS3_16 Functional imaging of cells and tissues
LS3_17 Theoretical modelling in cellular, developmental and regenerative biology

Primary Sector: LS4 Physiology in Health, Disease and Ageing

Keywords:

LS4_1 Organ and tissue physiology and pathophysiology
LS4_2 Comparative physiology
LS4_3 Physiology of ageing
LS4_4 Endocrinology
LS4_5 Non-hormonal mechanisms of inter-organ and tissue communication
LS4_6 Microbiome and host physiology
LS4_7 Nutrition and exercise physiology
LS4_8 Impact of stress (including environmental stress) on physiology
LS4_9 Metabolism and metabolic disorders, including diabetes and obesity
LS4_10 The cardiovascular system and cardiovascular diseases
LS4_11 Haematopoiesis and blood diseases
LS4_12 Cancer
LS4_13 Other non-communicable diseases (except disorders of the nervous system and immunity-related)

diseases)

Primary Sector: [LS5](#) Neuroscience and Disorders of the Nervous System

Keywords:

LS5_1 Neuronal cells
LS5_2 Glial cells and neuronal-glial communication
LS5_3 Neural development and related disorders
LS5_4 Neural stem cells
LS5_5 Neural networks and plasticity
LS5_6 Neurovascular biology and blood-brain barrier
LS5_7 Sensory systems, sensation and perception, including pain
LS5_8 Neural basis of behaviour (e.g. sleep, consciousness, addiction)
LS5_9 Neural basis of cognition (e.g. learning, memory, attention, emotions, speech)
LS5_10 Ageing of the nervous system
LS5_11 Neurological and neurodegenerative disorders
LS5_12 Mental disorders
LS5_13 Nervous system injuries and trauma, stroke
LS5_14 Repair and regeneration of the nervous system
LS5_15 Neuroimmunology, neuroinflammation
LS5_16 Systems and computational neuroscience (e.g. modelling, simulation, brain oscillations, connectomics)
LS5_17 Imaging in neuroscience
LS5_18 Innovative methods and tools for neuroscience

Primary Sector: [LS6](#) Immunity, Infection and Immunotherapy

Keywords:

LS6_1 Innate immunity
LS6_2 Adaptive immunity
LS6_3 Regulation of the immune response
LS6_4 Immune-related diseases
LS6_5 Biology of pathogens (e.g. bacteria, viruses, parasites, fungi)
LS6_6 Infectious diseases
LS6_7 Mechanisms of infection
LS6_8 Biological basis of prevention and treatment of infection
LS6_9 Antimicrobials, antimicrobial resistance
LS6_10 Vaccine development
LS6_11 Innovative immunological tools and approaches, including therapies

Primary Sector: [LS7](#) Prevention, Diagnosis and Treatment of Human Diseases

Keywords:

LS7_1 Medical imaging for prevention, diagnosis and monitoring of diseases
LS7_2 Medical technologies and tools (including genetic tools and biomarkers) for prevention, diagnosis, monitoring and treatment of diseases
LS7_3 Nanomedicine
LS7_4 Regenerative medicine
LS7_5 Applied gene, cell and immune therapies
LS7_6 Other medical therapeutic interventions, including transplantation
LS7_7 Pharmacology and toxicology
LS7_8 Effectiveness of interventions, including resistance to therapies
LS7_9 Public health and epidemiology
LS7_10 Preventative and prognostic medicine
LS7_11 Environmental health, occupational medicine
LS7_12 Health care, including care for the ageing population

LS7_13 Palliative medicine
LS7_14 Digital medicine, e-medicine, medical applications of artificial intelligence
LS7_15 Medical ethics

Primary Sector: LS8 Environmental Biology, Ecology and Evolution

Keywords:

LS8_1 Ecosystem and community ecology, macroecology
LS8_2 Biodiversity
LS8_3 Conservation biology
LS8_4 Population biology, population dynamics, population genetics
LS8_5 Biological aspects of environmental change, including climate change
LS8_6 Evolutionary ecology
LS8_7 Evolutionary genetics
LS8_8 Phylogenetics, systematics, comparative biology
LS8_9 Macroevolution and paleobiology
LS8_10 Ecology and evolution of species interactions
LS8_11 Behavioural ecology and evolution
LS8_12 Microbial ecology and evolution
LS8_13 Marine biology and ecology
LS8_14 Ecophysiology, from organisms to ecosystems
LS8_15 Theoretical developments and modelling in environmental biology, ecology, and evolution

Primary Sector: LS9 Biotechnology and Biosystems Engineering

Keywords:

LS9_1 Bioengineering for synthetic and chemical biology
LS9_2 Applied genetics, gene editing and transgenic organisms
LS9_3 Bioengineering of cells, tissues, organs and organisms
LS9_4 Microbial biotechnology and bioengineering
LS9_5 Food biotechnology and bioengineering
LS9_6 Marine biotechnology and bioengineering
LS9_7 Environmental biotechnology and bioengineering
LS9_8 Applied plant sciences, plant breeding, agroecology and soil biology
LS9_9 Plant pathology and pest resistance
LS9_10 Veterinary and applied animal sciences
LS9_11 Biomass production and utilisation, biofuels
LS9_12 Ecotoxicology, biohazards and biosafety

Domain: Social Sciences and Humanities

Primary Sector: SH1 Individuals, Markets and Organisations

Keywords:

SH1_1 Macroeconomics; monetary economics; economic growth, labour economics
SH1_2 International trade; international business; spatial economics
SH1_3 Development economics political economics
SH1_4 Finance; financial markets
SH1_5 Corporate finance; international finance
SH1_6 Banking, insurance
SH1_7 Accounting, asset prices, auditing
SH1_8 Econometrics, game theory, decision theory
SH1_9 Behavioural economics; experimental economics; neuro-economics
SH1_10 Microeconomics, industrial organisation, applied microeconomics
SH1_11 Innovation, research & development, entrepreneurship

SH1_12 Management; operations management, international management
SH1_13 Human resource management; organisational behaviour
SH1_14 Strategy, operation research
SH1_15 Marketing, consumer behaviour
SH1_16 Quantitative economic history, economic systems, institutional economics

Primary Sector: SH2 Institutions, Governance and Legal Systems

Keywords:

SH2_1 Political systems, governance
SH2_2 Democratisation and social movements
SH2_3 Conflict resolution, war, peace building
SH2_4 Legal studies, comparative law, law and economics
SH2_5 Constitutions, human rights, international law
SH2_6 International relations, global and transnational governance
SH2_7 Humanitarian assistance and development
SH2_8 Political and legal philosophy
SH2_9 Digital approaches to political science and law

Primary Sector: SH3 The Social World and Its Interactions

Keywords:

SH3_1 Social structure, social mobility, social innovation
SH3_2 Inequalities, discrimination, prejudice
SH3_3 Aggression and violence, antisocial behaviour, crime
SH3_4 Social integration, exclusion, prosocial behaviour
SH3_5 Social attitudes and beliefs
SH3_6 Social influence; power and group behaviour
SH3_7 Social policies, welfare, work and employment
SH3_8 Poverty and poverty alleviation
SH3_9 Social aspects of teaching and learning, curriculum studies, education and educational policies
SH3_10 Communication and information, networks, media
SH3_11 Digital social research
SH3_12 Social studies of science and technology

Primary Sector: SH4 The Social World and Its Interactions

Keywords:

SH4_1 Cognitive basis of human development, developmental disorders; comparative cognition
SH4_2 Personality and social cognition; emotion
SH4_3 Clinical and health psychology
SH4_4 Neurocognitive psychology
SH4_5 Attention, perception, action, consciousness
SH4_6 Learning, memory; cognition in ageing
SH4_7 Reasoning, decision-making; intelligence
SH4_8 Language learning and processing (first and second languages)
SH4_9 Theoretical linguistics; computational linguistics
SH4_10 Language typology; historical linguistics
SH4_11 Pragmatics, sociolinguistics, linguistic anthropology, discourse analysis

Primary Sector: SH5 The Social World and Its Interactions

Keywords:

SH5_1 Classics, ancient literature
SH5_2 Theory and history of literature, comparative literature

SH5_3 Book studies
SH5_4 Philology; text and image studies
SH5_5 Palaeography and codicology
SH5_6 Philosophy of mind, philosophy of language
SH5_7 Philosophy of science, epistemology, logic
SH5_8 Metaphysics, philosophical anthropology; aesthetics
SH5_9 Ethics and its applications; social philosophy
SH5_10 History of philosophy
SH5_11 Digital humanities; digital approaches to literary studies and philosophy

Primary Sector: SH6 The Study of the Human Past

Keywords:

SH6_1 Archaeological methods and theory, history of archaeology
SH6_2 Prehistoric archaeology, archaeology of non-literate societies
SH6_3 Archaeology of early literate societies and early civilizations
SH6_4 Medieval and post-medieval archaeologies
SH6_5 Archaeological science, bioarchaeology, environmental archaeology, geoarchaeology
SH6_6 Digital, computational, virtual and geospatial archaeologies
SH6_7 Historiography, theory and methods of history, including the analysis of digital data
SH6_8 Ancient history, medieval history
SH6_9 Early modern, modern, and contemporary history
SH6_10 Colonial and post-colonial history
SH6_11 Global, transnational, and comparative history
SH6_12 Social and economic history
SH6_13 Cultural history, intellectual history
SH6_14 History of science and technologies, environmental history

Primary Sector: SH7 Human Mobility, Environment, and Space

Keywords:

SH7_1 Human, economic and social geography
SH7_2 Migration
SH7_3 Population dynamics: households, family and fertility
SH7_4 Social aspects of health, ageing and society
SH7_5 Sustainability sciences, environment and resources, ecosystem services
SH7_6 Environmental and climate change, societal impact and policy
SH7_7 Cities; urban, regional and rural studies
SH7_8 Land use and planning
SH7_9 Energy, transportation and mobility
SH7_10 GIS, spatial analysis; digital geography

Primary Sector: SH8 Studies of Cultures and Arts

Keywords:

SH8_1 Kinship; diversity and identities, gender, interethnic relations
SH8_2 Religious studies, ritual; symbolic representation
SH8_3 Cultural studies and theory, cultural identities and memories, cultural heritage
SH8_4 Museums, exhibitions, conservation and restoration
SH8_5 History of art and of architecture
SH8_6 Architecture, design, craft, creative industries
SH8_7 Music and musicology; history of music
SH8_8 Visual and performing arts, screen, arts-based research
SH8_9 Digital approaches to anthropology, cultural studies and art