

Research area and Keywords

In the online portal, we ask you to choose a research area and 3-5 keywords that best fit your proposal. The first two keywords should be from the research area selected. The other 1-3 keywords can be freely chosen from all Research areas.

You can choose the keywords and research area from a pre-defined list, similar to the list used in MSCA programmes. The list includes subcategories for each of the research areas. These are not used anywhere in the evaluation procedure, but included for your convenience only.

To select the right research area, we recommend you to start with choosing the keywords that best represent your proposal. Knowing the keywords, select the research area that best fits your selection.

Note: The research area and keywords are used for the selection of reviewers, and not used in any other way in the evaluation procedure.

Keywords per Research Area

| Chemistry (CHE) | | |
|--|---|--|
| <u>C1 – Inorganic Chemistry</u> | | |
| Bioinorganic chemistry | Catalytic materials | Coordination chemistry |
| Chemistry of non-metals | Inorganic chemistry | Organometallic chemistry |
| Radiation and nuclear chemistry | Solid state materials | |
| <u>C2 – Organic, Polymer and Molecular Chemistry</u> | | |
| Carbohydrates | Chirality | Click chemistry |
| Combinatorial chemistry | Heterocyclic chemistry | Macromolecular chemistry |
| Molecular architecture and structure | Molecular chemistry | Natural product synthesis |
| Nucleic acid chemistry | Organic chemistry | Organic reaction mechanisms |
| Peptide chemistry | Polymer chemistry | Stereochemistry |
| Supramolecular chemistry | Synthetic organic chemistry | |
| <u>C3 – Physical and Analytical Chemistry</u> | | |
| Analytical chemistry | Chemical instrumentation and instrumental techniques | Chemical reactions: mechanisms, dynamics, kinetics and catalytic reactions |
| Chemistry of condensed matter | Crystallography and X-ray diffraction | Chromatography |
| Colloid chemistry | Corrosion | Crystallisation |
| Electrochemistry, electro dialysis, microfluidics, sensors | Forensic chemistry | Homogeneous catalysis |
| Heterogeneous catalysis | Ionic liquids | Magnetic resonance |
| Mass spectrometry | Method development in chemistry | Microscopy |
| Molecular dynamics | Molecular electronics | Photocatalysis |
| Photochemistry | Physical chemistry | Physical chemistry of biological systems |
| Quantum chemistry | Separation techniques/extraction | Spectroscopic and spectrometric techniques |
| Surface chemistry | Theoretical and computational chemistry | Trace analysis |
| <u>C4 – Applied and Industrial Chemistry</u> | | |
| Batteries | Biological chemistry, biochemistry | Biomaterials, biomaterial synthesis |
| Ceramics | Coating | Enzymology |
| Food chemistry | Fuel cells | Graphene, carbon nanotubes |
| Green chemistry | Hydrogen production/storage | Intelligent materials, self-assembled materials |
| Materials for sensors | Medicinal chemistry | Nanochemistry |
| Nano-materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles | Pharmaceutical processes and production, Regulatory aspects, quality assurance, good manufacturing practice | Plastics |
| Porous materials, metal organic framework (MOFs) | Solar cells | Structural properties of materials |
| Surface modification | Targeted drug delivery/discovery | Thin films |
| Toxicology | Water splitting | Water treatment/purification |
| <u>Economic Sciences (ECO)</u> | | |
| <u>E1 – Economics</u> | | |
| Applied research econometrics | Behavioural and experimental economics | Economic geography |
| Economic growth | Economic history | Economics of education |
| Environment economics | Financial econometrics | Game theory |
| Global macroeconomic challenges | Health economics | Industrial economics |
| International trade | Labour economics | Macroeconomics theory |
| Monetary economics, international finance | Political economy | Public economics |
| Social economics, welfare economics | Statistics and big data | Urban and regional economics |
| <u>E2 – Economic Development</u> | | |
| Circular economy | Cluster development | Environment issues in development economics |
| Key enabling technologies for development | Natural resources management | Public administration |
| Research & Open innovation, competitiveness | | |
| <u>E3 – Management</u> | | |

| | | |
|---|---|---|
| Corporate governance and management | Human resources management | Industrial organisation |
| Research and innovation management | Start-up's, new business models in entrepreneurship, social entrepreneurship | Strategy, marketing |
| Value chain and optimisation | | |
| E4 – Finance | | |
| Accounting, international accounting standards, reporting, tax issues related to accounting | Banks, insurance companies, financial intermediaries & fund, credit rating agencies | Corporate finance, fundamentals analysis, capital budgeting, venture capital, risk assessment |
| Financial markets, stock markets, fixed income markets, other markets investments, asset pricing, bonds, derivatives, commodities | | |

Information Science and Engineering (ENG)

| | | |
|---|--|---|
| G1 - Computer science and informatics | | |
| Algorithms, distributed, parallel and network algorithms, algorithmic game theory | Artificial intelligence, intelligent systems, multi agent systems | Bioinformatics, e-Health, medical informatics |
| Cognitive modelling, cognitive engineering, cognitive sciences | Complexity and cryptography, electronic security, privacy, biometrics | Theorem proving, symbolic, algebraic computations |
| Pervasive computing, ubiquitous computing, ambient intelligence, internet of things | Computer games, computer geometry, multimedia, augmented and virtual reality | Computer graphics, computer vision, multimedia, computer games |
| Parallel/distributed systems, GPGPU, grid, cloud processing systems | E-commerce, e-business, computational finance | E-learning, user modelling, collaborative systems |
| Intelligent robotics, cybernetics | Internet and semantic web, ontologies, database systems and libraries | Machine learning, data mining, statistical data processing and applications |
| Modelling engineering, human computer interaction, natural language processing | Numerical analysis, simulation, optimisation, modelling tools | Scientific computing and data processing |
| Sensor networks, embedded systems, hardware platforms | Software engineering, operating systems, computer languages | Neural networks, connectionist systems, fuzzy logic |
| Evolutionary computing, biologically-inspired computing | Theoretical computer science, formal methods | Quantum computing, DNA computing, photonic computing |
| G2 - Systems and Communication Engineering: Electrical, electronic, communication, optical and systems engineering | | |
| Control Engineering | Diagnostic and implantable devices, environmental monitoring | Electrical and electronic engineering: semiconductors, components, systems |
| Electronics, photonics | Human-computer-interfaces | Nano engineering |
| Networks (communication networks, sensor networks, networks of robots, etc.) | Optical engineering, photonics, lasers | Signal processing |
| Simulation engineering and modelling | Systems engineering, sensorics, actorics, automation | Wireless communications, communication, high frequency, mobile technology |
| G3 - Products and Processes Engineering: Product design, process design and control, construction methods, civil engineering, energy processes, material engineering | | |
| Aerospace engineering | Architecture, smart buildings, smart cities, urban engineering | Chemical engineering, technical chemistry |
| Civil engineering | Computational engineering and computer aided design | Energy collection, conversion and storage, renewable energy |
| Energy systems, smart energy, smart grids, wireless energy transfer | Environmental engineering and geotechnics | Fluid mechanics, hydraulic-, turbo-, and piston engines |
| Industrial bioengineering | Industrial design (product design, ergonomics, man-machine interfaces, etc.) | Lightweight construction, textile technology |
| Maritime engineering | Materials engineering | Mechanical and manufacturing engineering (shaping, mounting, joining, separation) |
| Production technology, process engineering | Sustainable design (for recycling, for environment, eco-design) | Transport engineering, intelligent transport systems |
| Waste treatment | | |

Environmental and Geosciences (ENV)

| | | |
|--|--------------------------------------|------------------------------------|
| V1 - Environment and society | | |
| Clean technologies, circular economy, life | Environmental determinants of health | Environmental regulations, climate |

| | | |
|---|---|--|
| cycle assessment | | negotiations and citizen science |
| Environmental risk assessment, monitoring | Mobility and transportation | Social and industrial ecology, sustainable development |
| Spatial and regional planning (including landscape and land management), GIS | Urbanization and urban planning, cities | Waste, by-products and residue management (including from agriculture) |
| V2 - Earth system science | | |
| Atmospheric chemistry, atmospheric composition, air pollution, indoor air quality | Biogeochemistry, biogeochemical cycles | Clean exploration and exploitation of natural resources |
| Climatology and climate change | Cryosphere, dynamics of snow and ice cover, sea ice, permafrost and ice sheets | Earth observations from space/remote sensing |
| Environmental chemistry, environmental forensics | Geochemistry, crystal chemistry, isotope geochemistry | Geology, tectonics, volcanology, physics of earth's interior, seismology |
| Hydrology, water management | Meteorology, atmospheric physics and dynamics | Mineralogy, petrology, igneous petrology, metamorphic petrology |
| Natural hazards | Noise pollution | Oceanography, marine science, coastal engineering |
| Paleoclimatology, paleoecology | Physical geography | Pollution (water, soil, sediment), rehabilitation and reconstruction of polluted areas, clean technologies |
| Sedimentology, soil science, palaeontology | Terrestrial ecology, land cover change | |
| V3 - Evolutionary, population and environmental biology | | |
| Animal behaviour | Biogeography, macro-ecology | Biodiversity, conservation biology |
| Comparative biology | Ecology | Ecotoxicology |
| Environmental, marine and freshwater biology | Population biology, population dynamics, population genetics | Species interactions (e.g. food-webs, symbiosis, parasitism, mutualism, bio-invasion) |
| Systems evolution, biological adaptation, phylogenetics, systematics | | |
| V4 - Food Science, Agriculture, Forestry and Non-Medical Biotechnology | | |
| Agriculture production systems (animals) | Agriculture production systems (crops), including fertilisation and nutrient management | Applied plant biology |
| Applied biotechnology (non-medical), bioreactors, applied microbiology | Aquaculture, fisheries | Biohazards, biological containment, biosafety, biosecurity |
| Biomass and biofuels production | Biomimetics | Crop protection, pest and disease control |
| Environmental biotechnology, bioremediation, biodegradation | Food sciences, safety, traceability, authenticity, agroindustry | Forestry and forest management, agroforestry |
| Soil biology, soil functionality, soil management | | |

Life Sciences (LIF)

| | | |
|---|---|---|
| L1 - Molecular and Structural Biology | | |
| Biophysics (e.g. transport mechanisms, bioenergetics, fluorescence) | DNA synthesis and degradation | DNA repair and recombination |
| Molecular metabolism | Molecular interactions | Protein synthesis, folding, modification and turnover |
| Lipid synthesis, modification and turnover | Carbohydrate synthesis, modification and turnover | RNA synthesis, processing, modification and degradation |
| Structural biology (e.g. crystallography, EM, NMR, PET) | | |
| L2 - Genetics, Genomics, Bioinformatics and Systems Biology | | |
| Applied genetic engineering, transgenic organisms, recombinant proteins, biosensors | Bioinformatics | Biological systems analysis, modelling and simulation |
| Biostatistics | Computational biology | Epigenetics and gene regulation |
| Genetic epidemiology | Genomics and functional genomics | Genetic and genomic variation and related disorders |
| Comparative, evolutionary and population genomics | Chromosome structure organisation and dynamics | Metabolomics (including glycomics) |
| Molecular genetics, reverse genetics and RNAi | Proteomics | Quantitative genetics |

| | | |
|--|---|---|
| Systems biology | Transcriptomics | Plant genetics |
| Genome editing | Genetic pharmacology | |
| L3 - Cellular and Developmental Biology | | |
| Developmental biology and technology | Pattern formation and embryology in animal organisms | Molecular transport mechanisms |
| Mechanisms of growth control and cell proliferation | Cell differentiation, physiology and dynamics | Morphology and functional imaging of cells |
| Organelle biology | Plant development pattern formation and embryology in plants | Molecular mechanisms of signal transduction |
| Stem cells and cellular programming | Mechanisms and dynamics of cell migration | |
| L4 - Physiology, Pathophysiology and Endocrinology | | |
| Ageing | Cancer and its biological basis | Cardiovascular diseases |
| Comparative physiology | Endocrinology | Metabolism, biological basis of metabolism related disorders |
| Organ physiology and pathophysiology | Environmental physiology | Rare/orphan Diseases |
| Reproductive biomedicine (reproductive physiology and endocrinology, infertility and pregnancy research) | | |
| L5 - Neurosciences and neural disorders | | |
| Behavioural neuroscience (e.g. sleep, rhythms, speech, handedness) | Cognitive neuroscience (e.g. learning, memory, emotions, consciousness) | Neural development and neuroplasticity |
| Mechanisms of pain | Molecular and cellular neuroscience | Neuroanatomy and excitability |
| Physiology of nerves and motor systems | Medicines, psychoactive drugs and pharmacology, poison. | Neuroimaging and computational neuroscience |
| Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease) | Psychiatric disorders and clinical psychology (e.g. schizophrenia, autism, Tourette's syndrome, obsessive compulsive disorder, depression, bipolar disorder, attention deficit hyperactivity disorder, addiction) | Sensory perception (nose and smell, tongue and taste, eyes and vision, ears and hearing, skin, pain, touch and movements) |
| L6 - Immunity and infection | | |
| Bacteriology | Biological basis of cancer immunity | Biological basis of auto-immunity/tolerance |
| Biological basis of immunity related inflammatory disorders | Biological basis of other immunity related disorders | Cellular and adaptive immunity |
| Immunogenetics | Immunological memory and tolerance | Immunosignalling |
| Microbiology | Parasitology | Phagocytosis and innate immunity |
| Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide) | Veterinary medicine and infectious diseases in animals | Virology |
| L7 - Diagnostic tools, therapies and public health | | |
| Diagnostic tools (e.g. genetic, molecular diagnostic) | Drug discovery and design (formulation and delivery) | Drug therapy and clinical studies |
| In vivo bio and medical imaging | In vitro cell and tissue imaging | Environment and health risks, occupational medicine |
| Gene therapy, cell therapy, regenerative medicine | Tissue regeneration and engineering | Immunotherapy (vaccine discovery, genetic vaccines) |
| Health services, health care research | Medical engineering and technology | Personalised medicine (diagnostic/prognostic biomarker, patient-orientated management solutions) |
| Pharmacology, pharmacogenomics | Public health and epidemiology | Radiation therapy |
| Surgery | | |

Mathematics (MAT)

| | | |
|-----------------------------------|--------------------------|--|
| M1 - Mathematics | | |
| Algebraic geometry | Algebraic number theory | Algebraic topology |
| Algorithms and complexity | Analytic number theory | Category theory and algebraic structures |
| Combinatorics | Complex analysis | Complex geometry |
| Differential Geometry | Functional analysis | Game Theory |
| General topology | Graph Theory | Group Theory |
| Harmonic analysis | Homological algebra | Low dimensional topology |
| Mathematical logic and set theory | Non commutative Geometry | Ordinary Differential Equations and |

| | | |
|---|---|---------------------------------|
| | | Dynamical Systems |
| Partial Differential Equations | Probability | Ring theory |
| Set theory | | |
| M2 – Applied Mathematics | | |
| Control Theory | Data Analysis | Mathematical aspects of Biology |
| Mathematical aspects of Computer Science | Mathematical aspects of Economy and Finance | Mathematical aspects of Physics |
| Mathematics in Engineering and other Applied Sciences | Numerical analysis and scientific computing | Operational Research |
| Optimization | Scientific Computing | Statistics |

Physics (PHY)

| | | |
|---|---|--|
| P1 – Particle and Nuclear Physics | | |
| Fundamental interactions and fields | Neutrino oscillations | Nuclear physics, heavy ions |
| Nuclear physics, nuclear structure | Particle accelerators and detectors | Particle physics, experiment |
| Particle physics, theory/phenomenology | Supersymmetric particles | Quantum chromodynamics |
| Quantum field theory | | |
| P2 – Atomic and molecular physics, optics | | |
| Atomic physics | Chemical Physics | Cold/Ultra-cold atoms and molecules |
| Laser physics | Metrology and measurement | Molecular physics |
| Nano-optics | Non linear optics | Interferometry |
| Optical physics | Photonics | Statistical physics (gases) |
| Quantum optics | Quantum electrodynamics | |
| P3 - Condensed matter physics | | |
| Condensed matter, thermal properties | Condensed matter, transport properties | Condensed matter, mechanical and acoustical properties, lattice dynamics |
| Electronic properties of materials, surfaces, interfaces | Films and Interfaces | Fluid dynamics |
| Gas and plasma physics | High pressure physics | Low-temperature physics |
| Magnetism and strongly correlated systems | Mesoscopic physics | Nanophysics: nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics, etc. |
| Phase transitions, phase equilibria | Polymer physics | Semiconductors and insulators |
| Soft condensed matter | Spintronics | Statistical mechanics (condensed matter) |
| Structure of solids and liquids | Superconductivity | Superfluids |
| Surface Physics | | |
| P4 – Astrophysics, Cosmology, Space science | | |
| Active Galactic Nucleus (AGN) , QSO | Astrobiology, astrochemistry | Astrometry |
| Astronomical instrumentation: telescopes, detectors, techniques | Astrophysical jets, accretion phenomena | Big bang nucleosynthesis |
| Clusters of galaxies and large scale structures | Cosmic Microwave Background (CMB) | Cosmology |
| Dark matter, dark energy | Formation and evolution of galaxies | Formation, structure and evolution of stars |
| Extrasolar planets and exoplanets | Gravitational lensing | Gravitational waves |
| High energy astrophysics | Interstellar medium | Nuclear astrophysics |
| Radio astronomy | Relativistic astrophysics | Solar physics |
| Solar system and planetary science | Space weather | |
| P5 – Applied physics | | |
| Acoustics | Agrophysics | Biophysics and biophysical techniques |
| Communication Physics | Complex systems, Networks | Computational Physics |
| Geophysics | Laser applications | Medical Physics |
| Nanotechnology: nanomaterials, tools and techniques, applications of nanotechnology | Optical engineering | Optoelectronics |
| Photodetectors | Photonics applications | Photovoltaics and solar cells |
| Plasmonics | Quantum electronics | Quantum Technology and Quantum Devices |
| Solid-state devices | | |

Social Sciences and Humanities (SOC)

| <u>S1 - Sociology, social anthropology</u> | | |
|--|---|---|
| Ageing, health social policies | Attitudes and values | Demography, population issues and policies |
| Fertility, family dynamics, policies | Gender studies | Globalization, glocalization, antiglobalism |
| Inequalities, discrimination, prejudice, aggression and violence, antisocial behaviour | Kinship, cultural dimensions of classification and cognition, identity | Migration, refugees, asylum, interethnic relations, conflicts and integration of migrants |
| Myth, ritual, symbolic representations, religious studies | Qualitative methods, ethnography, case studies | Rural population, agriculture, innovation, depopulation |
| Social economy, social entrepreneurship | Social influence, power and group behaviour, classroom management | Social integration, exclusion, inequalities, participation and prosocial behaviour |
| Social structure, social mobility | Social theory | Social welfare and neoliberalism |
| Sociology of education | Sociology of knowledge | Transformation of societies, democratization, social movements |
| Urban sociology, urban theory, urban studies, global cities, territorialisation | Work, employment, precariousness | Youth studies |
| <u>S2 - Political science</u> | | |
| Comparative politics | Development studies | Electoral politics, Political parties, Citizenship and public engagement |
| EU and European politics | Foreign policy | Game theory, Logic of collective choice |
| Human, economic and social geography | International relations, Global governance, International politics and history; geopolitics | Migration policy |
| Political economy | Political systems and institutions, governance | Political theory, Political thought, Political philosophy; Ideologies |
| Politics of gender, Race, Discrimination and inequalities; Identity politics | Public administration, Public policies | Regional and territorial politics |
| Relations with public interest groups | Theories of conflict, violence and security; Negotiation and mediation | |
| <u>S3 - Law</u> | | |
| Business, corporate and securities law | Comparative law | Criminal law |
| Education law | Employment and labour law, social law | European law |
| Family and juvenile law | Health law | Intellectual property and innovation law; Data protection law, IT law |
| International law, human and civil rights; Violence, conflict and peacebuilding | Legal systems, constitutions, foundations of law | Private law, consumer protection law |
| Public law, immigration law, environmental law | Sports and entertainment law | |
| <u>S4 - Communication</u> | | |
| Communication networks, media, including social media, information society | Crisis communication theory and procedures | Digital social research, audiovisual social services |
| Information & communication technology and the world of work | Information society and education | Institutional communication |
| Lobbying | Political communication and strategy | Social communication, verbal and non verbal communication |
| Social studies of science and technology | | |
| <u>S5 - Cognition, psychology, linguistics</u> | | |
| Biological psychology: mind-body connection, health, stress and disease | Cognitive psychology: learning, cognition | Development across the life-span and developmental psychopathology |
| Ergonomics, human factors, user modelling, and neuroergonomics | Evolution of mind and cognitive functions, animal communication | Formal, cognitive, functional and computational linguistics |
| Neuropsychology and neurolinguistics | Psycholinguistics: acquisition, comprehension, production | Socio-cultural psychology and social cognition |
| Typological, historical and comparative linguistics | Use of language: pragmatics, sociolinguistics, discourse analysis, second language teaching and learning, lexicography, terminology | |
| <u>S6 - Philosophy</u> | | |
| Aesthetics and philosophy of culture and anthropology | Analytic philosophy | Epistemology, logic, philosophy of science |
| Ethics and morality, bioethics | History of philosophy | Metaphysics |
| Phenomenology | Philosophy of religion | Social and political philosophy |

| S7 – Education | | |
|---|---|---|
| Education systems, institutions and policies, sociology of education | Educational assessment, feedback | Learning technologies, e-learning, tutoring systems, learning analytics |
| Lifelong learning, workplace learning and training, heutagogy | Philosophy of education, human development | Teaching and learning methodologies, pedagogy, andragogy, psychology of education |
| S8 - Literature, arts, music, cultural and comparative studies | | |
| African literature | Classics, ancient Greek and Latin literature and art | Comparative literature |
| Computational modelling and digitisation in the cultural Sphere | Contemporary literature | Cultural memory, intangible cultural heritage |
| Cultural studies, cultural diversity | History of art and architecture, arts-based research | History of art criticism |
| History of books, codicology | History of collections | History of fashion design |
| History of literature | Latin American literature | Library and archival science; Librarianship |
| Literary theory and comparative literature, literary styles | Medieval literature | Modern literature |
| Museums and exhibitions, conservation and restoration | Music and musicology, history of music | Oriental and East Asian literature |
| Textual philology, palaeography and epigraphy | Visual arts, performing arts, film, design | |
| S9 - Archaeology, history and memory | | |
| American archaeology, art and culture | Ancient history | Asian archaeology, art and culture |
| Classical archaeology and art, history of archaeology | Collective memories, identities, lieux de mémoire, oral history | Colonial and post-colonial history, global and transnational history, entangled histories |
| Cultural heritage, cultural memory | Cultural history; History of collective identities and memories | Diplomatics |
| Early and modern archaeology | Egyptology and ancient near eastern archaeology, art and culture | Gender history |
| General archaeology, archaeometry, landscape archaeology | Historiography, theory and methods in history, including the analysis of digital data | History of ideas, intellectual history, history of science, techniques and technologies |
| Industrial archaeology | Medieval history | Military history |
| Modern and contemporary archaeology | Modern and contemporary history | Numismatics, epigraphy |
| Prehistory, palaeoanthropology, palaeodemography, protohistory | Social, economic, cultural and political history | |