MSCA KEYWORDS

Scientific panel	Level 1 keywords	Level 2 keywords
Chemistry (CHE)	**C1-Inorganic Chemistry**	Catalysis Coordination chemistry Inorganic and nuclear chemistry NMP Non-Metallic Materials & basic processes Organometallic chemistry Radiation and nuclear chemistry
	C2-Organic, Polymer and Molecular Chemistry	Carbonhydrates Combinatorial chemistry Heterocyclic chemistry Macromolecular chemistry Molecular architecture and structure Molecular biology Molecular chemistry Natural product synthesis Organic chemistry Organic reaction mechanism Peptide chemistry Polymer chemistry Stereochemistry Supramolecular chemistry Synthetic Organic chemistry
	C3-Physical and Analytical Chemistry	Analytical chemistry Chemical instrumentation Chemical reactions: mechanisms, dynamics, kinetics and catalytic reactions Chemistry of condensed matter Chromatography Colloid chemistry Corrosion Crystallography and X-ray diffraction Electrochemistry, electrodialysis, microfluidics, sensors Forensic chemistry Heterogeneous catalysis Homogeneous catalysis Ionic liquids Mass Spectrometry Method development in chemistry Microscopy Molecular dynamics Molecular electronics Photocatalysis Photochemistry Physical chemistry Physical chemistry of biological systems Quantum Chemistry Spectroscopic and spectrometric techniques Structure and dynamics of disordered systems: soft matter (gels, colloids, liquid crystals, etc.), liquids, glasses, defects, etc. Surface chemistry Theoretical and computational chemistry Trace Analysis
	C4-Applied and Industrial Chemistry	Biochemistry Biological chemistry Biomaterials, biomaterials synthesis Ceramics Coating and films Drinking water treatment Electrochemistry, batteries and fuel cells Environment chemistry Enzymology Food chemistry Fuel cell technology Graphene, 2D materials Hydrogen Intelligent materials, self-assembled materials Materials for sensors Medicinal chemistry Nanochemistry New materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles Pharmaceutical chemistry Polymers and plastics Porous Materials Structural properties of materials Surface modification Thin films Toxicology

MSCA KEYWORDS

Scientific panel	Level 1 keywords	Level 2 keywords
Economic Sciences (ECO)	**E1-Economics**	Behavioural economics Big data Development, economic growth Econometrics, statistical methods Economic geography Economic history Industrial economics International trade Labour economics Macroeconomics Public economics Social economics Urban and regional economics
	E2-Economic Development	Competitiveness, innovation, research and development Economics of innovation Industrial clusters Natural resources and environmental economics
	E3-Management	Business governance Entrepreneurship Human resource management Innovation management Marketing strategy New industrial value chains Organization studies: theory & strategy, industrial organization Startups
	E4-Finance	Accounting Banking, corporate finance, accounting Finance, banking, insurance Financial & Investment management Financial markets, asset prices, international finance Venture capital
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 Augmented Reality Bioinformatics, biocomputing, and DNA and molecular computation Cloud computing Cognitive science Complexity and cryptography, electronic security, privacy, biometrics Computer architecture, pervasive computing, ubiquitous computing Computer games Computer graphics, computer vision, multi media, computer games Computer hardware and architecture Data mining E-Commerce E-learning, user modelling, collaborative systems Embedded systems Human computer interaction and interface, visualization and natural language processing Intelligent robotics, cybernetics Internet and semantic web, database systems and libraries Internet of Things Machine learning, statistical data processing and applications using signal processing (e.g. speech, image, video) Multimedia Networks (communication networks, sensor networks, networks of robots, etc.) Numerical analysis, simulation, optimisation, modelling tools Ontologies, neural networks, genetic programming, fuzzy logic Quantum Technologies (e.g. computing and communication) Scientific computing and data processing Software engineering, operating systems, computer languages Theoretical computer science, formal methods Virtual Reality
	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 interaction Nanotechnology, nano-materials, nano engineering Signal processing Simulation engineering and modelling Systems engineering, sensorics, actorics, automation Wireless communications, communication, high frequency, mobile technology

MSCA KEYWORDS

Scientific panel	Level 1 keywords	Level 2 keywords
	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 Civil engineering, maritime/hydraulic engineering, geotechnics, waste treatment 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
Environmental and Geosciences (ENV)	**V1-Environment and society**	Circular economy Environmental health Environmental regulations and climate negotiations Environmental risk measurement Mobility and transportation Renewable energy sources Spatial and regional planning Sustainable development and nature protection Urbanization and urban planning, cities
	V2-Earth system science	Air and water pollution control Atmospheric chemistry, atmospheric composition, air pollution Biogeochemistry, biogeochemical cycles, environmental chemistry Climatology and climate change Coastal Engineering Cryosphere, dynamics of snow and ice cover, sea ice, permafrost and ice sheets Earth observations from space/remote sensing ENV Environmental Hazard Analysis Environment, Pollution & Climate Environmental chemistry Geochemistry and geophysics Geology, tectonics, volcanology Hydrology Meteorology, atmospheric physics and dynamics Mineralogy, petrology, igneous petrology, metamorphic petrology Natural resources exploration and exploitation Paleoclimatology, paleoecology Physical geography Sedimentology, soil science, palaeontology, earth evolution Terrestrial ecology, land cover change
	V3-Evolutionary, population and environmental biology	Animal behaviour Biodiversity, comparative biology Biodiversity, conservation biology, conservation genetics Biogeography, macro-ecology Ecology Environmental toxicology at the population and ecosystems level Freshwater biology Marine 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-Applied Life Sciences and Non-Medical Biotechnology	Agricultural waste Agriculture / Forestry / Rural Development Agriculture related to animal husbandry, dairying, livestock raising Agriculture related to crop production, applied plant biology Agriculture related to crop production, soil biology and cultivation, applied plant biology Agroindustry Applied biotechnology (non-medical), bioreactors, applied microbiology Aquaculture, fisheries Biohazards, biological containment, biosafety, biosecurity Biomimetics Environmental biotechnology, bioremediation, biodegradation

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		Forestry, biomass production (e.g. for biofuels)
Life Sciences (LIF)	**L1-Molecular and Structural Biology**	Biophysics (e.g. transport mechanisms, bioenergetics, fluorescence) Carbohydrate synthesis, modification and turnover DNA synthesis, modification, repair, recombination, degradation Lipid synthesis, modification and turnover Metabolism Molecular biology and interactions Protein synthesis, modification and turnover RNA synthesis, processing, modification and degradation Structural biology
	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 engineering Genetic epidemiology Genomics, comparative genomics, functional genomics Metabolomics Molecular genetics, reverse genetics and RNAi Pharmacogenomics Plant genetics Proteomics Quantitative genetics Systems biology Transcriptomics
	L3-Cellular and Developmental Biology	Animal-related development, development genetics, pattern formation and embryology Cell biology and molecular transport mechanisms Cell differentiation, physiology and dynamics Cell signalling and cellular interactions Development, developmental genetics, pattern formation and embryology in plants Developmental biology Morphology and functional imaging of cells Organelle biology Signal transduction Stem cell biology
	L4-Physiology, Pathophysiology and Endocrinology	Ageing Cancer and its biological basis Cardiovascular diseases Comparative physiology and pathophysiology Endocrinology Metabolism, biological basis of metabolism related disorders Organ physiology and pathophysiology Rare diseases Technologies involving the manipulation of cells, tissues, organs or the whole organism (assisted reproduction)
	L5-Neurosciences and neural disorders	Behavioural neuroscience (e.g. sleep, consciousness, handedness) Developmental neurobiology Mechanisms of pain Molecular and cellular neuroscience Neuroanatomy and neurophysiology Neuroimaging and computational neuroscience Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease) Poisoning Psychiatric disorders Sensory systems (e.g. visual system, auditory system)
	L6-Immunity and infection	Adaptive immunity Anticancer therapy Bacteriology Biological basis of immunity related disorders (e.g. autoimmunity) Immunogenetics Immunological memory and tolerance Immunosignalling Innate immunity and inflammation Microbiology Parasitology Phagocytosis and cellular immunity Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide) Veterinary medicine and infectious diseases in animals Virology

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Scientific panel	Level 1 keywords	Level 2 keywords
	L7-Diagnostic tools, therapies and public health	Biophotonics, Imaging, image and data processing Bioremediation, diagnostic biotechnologies (DNA chips and biosensing devices) in environmental management Drug development, clinical phases Environment and health risks, occupational medicine Gene therapy, cell therapy, regenerative medicine Health services, health care research Medical engineering and technology Personalised medicine Pharmacology, pharmacogenomics, drug discovery and design, drug therapy Public health and epidemiology Radiation therapy Radiology, nuclear medicine and medical imaging Surgery Tissue engineering Vaccines
Mathematics (MAT)	**M1-Mathematics**	Algebraic and complex geometry Algorithms and complexity Discrete mathematics and combinatorics Geometry Logic and foundations Number theory Operator algebras and functional analysis Probability Theoretical aspects of partial differential equations Topology
	M2-Applied Mathematics	Application of mathematics in sciences Mathematical aspects of Computer Science Mathematical physics Numerical analysis and scientific computing Scientific computing, simulation and modelling tools Statistics
Physics (PHY)	**P1-Particle and Nuclear Physics**	Fundamental interactions and fields Nuclear physics Observational astronomy: cosmic rays, neutrinos, and other particles Particle physics Particles and fields physics
	P2-Atomic and molecular physics, optics	Atomic, molecular physics Chemical physics Lasers, ultra-short lasers and laser physics Metrology and measurement Nonlinear optics Optics (including laser optics and quantum optics) Optics, non-linear optics and nano-optics Photonics Quantum optics and quantum information Statistical physics (gases) Ultra-cold atoms and molecules Wave Interaction and Propagation
	P3-Condensed matter physics	Condensed matter physics (including formerly solid state physics, superconductivity) Electronic properties of materials, surfaces, interfaces, nanostructures, etc Fluid dynamics Gas and plasma physics Magnetism and strongly correlated systems Mechanical and acoustical properties of condensed matter, Lattice dynamics Mesoscopic physics Nanophysics: nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics, etc. Phase transitions, phase equilibria Semiconductors and insulators: material growth, physical properties Soft condensed matter Spintronics Statistical physics (condensed matter) Structure of solids and liquids Superconductivity Superfluids Surface Physics Thermal properties of condensed matter Transport properties of condensed matter
	P4-Astrophysics, Cosmology, Space science	Astrobiology Astrochemistry Clusters of galaxies and large scale structures Cosmology Dark matter, dark energy Exoplanets Formation and evolution of galaxies

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Scientific panel	Level 1 keywords	Level 2 keywords
		Formation of stars and planets Gravitational astronomy High energy and particles astronomy - X-rays, cosmic rays, gamma rays, neutrinos Instrumentation - telescopes, detectors and techniques Interstellar medium Nuclear astrophysics Observational astronomy: radio Relativistic astrophysics Solar and interplanetary physics Solar physics Space weather Stellar systems: multiple stars, clusters, and associations
	P5-Applied physics	Acoustics Communication Systems Computational modelling Geophysics Lasers and laser optics Macroscopic quantum phenomena: superconductivity, superfluidity, etc. Medical physics Optical engineering, photonics, lasers Optoelectronics Photonic integration, photonic integrated circuits Photovoltaics Plasmonics and metamaterials Solid state materials Statistical physics: phase transitions, noise and fluctuations, models of complex systems, etc.
Social Sciences and	**S1-Sociology, social anthropology**	Ageing, work, social policies Demography Ethnography Globalisation Globalisation, migration, interethnic relations Households, family and fertility Integration of refugees and migrants Kinship, cultural dimensions of classification and cognition, identity Myth, ritual, symbolic representations, religious studies Rural development studies Social and behavioural science Social Inclusion Social policies, work and welfare Social structure, inequalities, social mobility, interethnic relations Sociology Transformation of societies, democratization, social movements Urban studies, regional studies Women and gender studies Youth policy
	S2-Political science	Collective Awareness EU International Relations and Diplomacy Studies EU research policy /Research policies in the EU Geopolitics Human and social geography Migration Non-discrimination Peace and conflict studies Political economy, institutional economics, law and economics Political systems and institutions, governance Political theory Public administration Violence, conflict and conflict resolution
	S3-Law	Civil law, commercial law Criminal law Data protection Global and transnational governance, international law, human rights Health law rights Intellectual property rights International private law Law Legal studies, constitutions, comparative law Legal systems, constitutions, foundations of law Private, public and social law
	S4-Communication	Communication networks, media, information society Crisis management Digital Social Innovation
		Media and socio-cultural communication Social Media Social studies of science and technology
	S5-Cognition, psychology, linguistics	Cognition (e.g. learning, memory, emotions, speech) Developmental psychology Ergonomic and Human factors Evolution of mind and cognitive functions, animal communication

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		Fatigue and stress observation, analysis and coping Formal, cognitive, functional and computational linguistics Human life-span development Neuropsychology and cognitive psychology Psycholinguistics and neurolinguistics: acquisition and knowledge of language, language pathologies Social psychology Typological, historical and comparative linguistics Use of language: pragmatics, sociolinguistics, discourse analysis, second language teaching and learning, lexicography, terminology
	S6-Philosophy	Epistemology, logic, philosophy of science Ethics and morality, bioethics History of philosophy Philosophy Philosophy of mind, epistemology and logic Philosophy, Ethics and Religion
	S7-Education	Education Educational psychology Life long learning Pedagogy
	S8-Literature, arts, music, cultural and comparative studies	Arts (arts, history of arts, performing arts, music) Classics, ancient Greek and Latin literature and art Comparative literature Cultural memory, intangible cultural heritage Cultural studies, cultural diversity Design Fashion design General literature studies History of art and architecture History of literature Libraries and archives Library science Literary theory and comparative literature, literary styles Museums and exhibitions Music and musicology, history of music Studies on Film, Radio and Television Textual philology, palaeography and epigraphy
	S9-Archaeology, history and memory	Ancient history Archaeology Archaeology, archaeometry, landscape 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 Egyptology Gender history Historiography, theory and methods of history History of archaeology History of ideas, intellectual history, history of science, techniques and technologies Medieval history Military history Modern and contemporary history Numismatics, epigraphy Prehistory and protohistory Social, economic, cultural and political history