

ALLEGATO 1

ERC EVALUATION PANELS AND KEYWORDS

Physical Sciences and Engineering

PE1 Mathematics

All areas of mathematics, pure and applied, plus mathematical foundations of computer science, mathematical physics and statistics

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 Statistics

PE1_15 Discrete mathematics and combinatorics

PE1_16 Mathematical aspects of computer science

PE1_17 Numerical analysis

PE1_18 Scientific computing and data processing

PE1_19 Control theory and optimisation

PE1_20 Application of mathematics in sciences

PE1_21 Application of mathematics in industry and society

PE2 Fundamental Constituents of Matter

Particle, nuclear, plasma, atomic, molecular, gas, and optical physics

PE2_1 Fundamental interactions and fields

PE2_2 Particle physics

PE2_3 Nuclear physics

PE2_4 Nuclear astrophysics

PE2_5 Gas and plasma physics

PE2_6 Electromagnetism

PE2_7 Atomic, molecular physics

PE2_8 Ultra-cold atoms and molecules

PE2_9 Optics, non-linear optics and nano-optics

PE2_10 Quantum optics and quantum information

PE2_11 Lasers, ultra-short lasers and laser physics

PE2_12 Relativity

PE2_13 Thermodynamics

PE2_14 Non-linear physics

PE2_15 Metrology and measurement

PE2_16 Statistical physics (gases)

PE3 Condensed Matter Physics

Structure, electronic properties, fluids, nanosciences, biological physics

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, etc.

PE3_5 Physical properties of semiconductors and insulators

PE3_6 Macroscopic quantum phenomena: superconductivity, superfluidity, etc.

PE3_7 Spintronics

PE3_8 Magnetism and strongly correlated systems

PE3_9 Condensed matter – beam interactions (photons, electrons, etc.)

PE3_10 Nanophysics: nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics, etc.

PE3_11 Mesoscopic physics

PE3_12 Molecular electronics

PE3_13 Structure and dynamics of disordered systems: soft matter (gels, colloids, liquid crystals, etc.),

liquids, glasses, defects, etc.

PE3_14 Fluid dynamics (physics)

PE3_15 Statistical physics: phase transitions, noise and fluctuations, models of complex systems, etc.

PE3_16 Physics of biological systems

PE4 Physical and Analytical Chemical Sciences

Analytical chemistry, chemical theory, physical chemistry/chemical physics

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

PE5 Synthetic Chemistry and Materials

Materials synthesis, structure-properties relations, functional and advanced materials, molecular architecture, organic chemistry

PE5_1 Structural properties of materials

PE5_2 Solid state materials

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, biomaterials synthesis
PE5_8 Intelligent materials – self assembled materials
PE5_9 Coordination chemistry
PE5_10 Colloid chemistry
PE5_11 Biological chemistry
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

PE6 Computer Science and Informatics

Informatics and information systems, computer science, scientific computing, intelligent systems

PE6_1 Computer architecture, pervasive computing, ubiquitous computing
PE6_2 Computer systems, parallel/distributed systems, sensor networks, embedded systems, cyber-physical systems
PE6_3 Software engineering, operating systems, computer languages
PE6_4 Theoretical computer science, formal methods, and quantum computing
PE6_5 Cryptology, security, privacy, quantum cryptography
PE6_6 Algorithms, distributed, parallel and network algorithms, algorithmic game theory
PE6_7 Artificial intelligence, intelligent systems, multi agent systems
PE6_8 Computer graphics, computer vision, multi media, computer games
PE6_9 Human computer interaction and interface, visualisation and natural language processing
PE6_10 Web and information systems, database systems, information retrieval and digital libraries, data fusion
PE6_11 Machine learning, statistical data processing and applications using signal processing (e.g. speech, image, video)
PE6_12 Scientific computing, simulation and modelling tools
PE6_13 Bioinformatics, biocomputing, and DNA and molecular computation

PE7 Systems and Communication Engineering

Electrical, electronic, communication, optical and systems engineering

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 technology, high-frequency technology
PE7_7 Signal processing
PE7_8 Networks (communication networks, sensor networks, networks of robots, etc.)
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, application

PE8 Products and Processes Engineering

Product design, process design and control, construction methods, civil engineering, energy processes, material engineering

PE8_1 Aerospace engineering

PE8_2 Chemical engineering, technical chemistry

PE8_3 Civil engineering, architecture, maritime/hydraulic engineering, geotechnics, waste treatment

PE8_4 Computational engineering

PE8_5 Fluid mechanics, hydraulic-, turbo-, and piston- engines

PE8_6 Energy processes engineering

PE8_7 Mechanical and manufacturing engineering (shaping, mounting, joining, separation)

PE8_8 Materials engineering (biomaterials, metals, ceramics, polymers, composites, etc.)

PE8_9 Production technology, process engineering

PE8_10 Industrial design (product design, ergonomics, man-machine interfaces, etc.)

PE8_11 Sustainable design (for recycling, for environment, eco-design)

PE8_12 Lightweight construction, textile technology

PE8_13 Industrial bioengineering

PE9 Universe Sciences

Astro-physics/chemistry/biology; solar system; stellar, galactic and extragalactic astronomy, planetary systems, cosmology, space science, instrumentation

PE9_1 Solar and interplanetary physics

PE9_2 Planetary systems sciences

PE9_3 Interstellar medium

PE9_4 Formation of stars and planets

PE9_5 Astrobiology

PE9_6 Stars and stellar systems

PE9_7 The Galaxy

PE9_8 Formation and evolution of galaxies

PE9_9 Clusters of galaxies and large scale structures

PE9_10 High energy and particles astronomy – X-rays, cosmic rays, gamma rays, neutrinos

PE9_11 Relativistic astrophysics

PE9_12 Dark matter, dark energy

PE9_13 Gravitational astronomy

PE9_14 Cosmology

PE9_15 Space Sciences

PE9_16 Very large data bases: archiving, handling and analysis

PE9_17 Instrumentation - telescopes, detectors and techniques

PE10 Earth System Science

Physical geography, geology, geophysics, atmospheric sciences, oceanography, climatology, cryology, ecology, global environmental change, biogeochemical cycles, natural resources management

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, geodynamycs

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: earthquakes, landslides, tsunamis and other ground instabilities

Life Sciences

LS1 Molecular Biology, Biochemistry, Structural Biology and Molecular Biophysics

Molecular synthesis, modification, mechanisms and interactions, biochemistry, structural biology, molecular biophysics, signalling pathways

LS1_1 Macromolecular complexes including interactions involving nucleic acids, proteins, lipids and carbohydrates

LS1_2 Biochemistry

LS1_3 DNA synthesis, modification, repair, recombination, degradation

LS1_4 RNA synthesis, processing, modification, degradation

LS1_5 Protein synthesis, modification, turnover

LS1_6 Lipid biology

LS1_7 Glycobiology

LS1_8 Molecular biophysics (e.g. single-molecule approaches, bioenergetics, fluorescence)

LS1_9 Structural biology and its methodologies (e.g. crystallography, cryo-EM, NMR and new technologies)

LS1_10 Molecular mechanisms of signalling pathways

LS1_11 Fundamental aspects of synthetic biology and chemical biology

LS2 Genetics, 'Omics', Bioinformatics and Systems Biology

Molecular genetics, quantitative genetics, genetic epidemiology, epigenetics, genomics, metagenomics, transcriptomics, proteomics, metabolomics, glycomics, bioinformatics, computational biology, biostatistics, systems biology

LS2_1 Molecular genetics, reverse genetics, forward genetics, genome editing

LS2_2 Non-coding RNAs

LS2_3 Quantitative genetics

LS2_4 Genetic epidemiology

LS2_5 Epigenetics and gene regulation

LS2_6 Genomics (e.g. comparative genomics, functional genomics)

LS2_7 Metagenomics

LS2_8 Transcriptomics

LS2_9 Proteomics

LS2_10 Metabolomics

LS2_11 Glycomics/Lipidomics

LS2_12 Bioinformatics

LS2_13 Computational biology

LS2_14 Biostatistics

LS2_15 Systems biology

LS3 Cellular and Developmental Biology

Cell biology, cell physiology, signal transduction, organogenesis, developmental genetics, pattern formation and stem cell biology, in plants and animals, or, where appropriate, in microorganisms

LS3_1 Morphology and functional imaging of cells and tissues

LS3_2 Cytoskeleton and cell behaviour (e.g. control of cell shape, cell migration and cellular mechanosensing)

LS3_3 Organelle biology and trafficking

LS3_4 Cell junctions, cell adhesion, cell communication and the extracellular matrix

LS3_5 Cell signalling and signal transduction

LS3_6 Cell cycle, division and growth

LS3_7 Cell death (including senescence) and autophagy

LS3_8 Cell differentiation, physiology and dynamics

LS3_9 Developmental genetics in animals and plants

LS3_10 Embryology and pattern formation in animals and plants

LS3_11 Tissue organisation and morphogenesis in animals and plants (including biophysical approaches)

LS3_12 Stem cell biology in development, tissue regeneration and ageing, and fundamental aspects of stem cell-based therapies

LS4 Physiology, Pathophysiology and Endocrinology

Organ physiology, pathophysiology, endocrinology, metabolism, ageing, tumorigenesis, cardiovascular diseases, metabolic syndromes

LS4_1 Organ physiology and pathophysiology

LS4_2 Comparative physiology and pathophysiology

LS4_3 Molecular aspects of endocrinology

LS4_4 Fundamental mechanisms underlying ageing

LS4_5 Metabolism, biological basis of metabolism-related disorders

LS4_6 Fundamental mechanisms underlying cancer

LS4_7 Fundamental mechanisms underlying cardiovascular diseases

LS4_8 Non-communicable diseases (except for neural/psychiatric and immunity-related diseases)

LS5 Neuroscience and Neural Disorders

Neural cell function and signalling, systems neuroscience, neural bases of cognitive and behavioural processes, neurological and psychiatric disorders

LS5_1 Neural cell function, communication and signalling, neurotransmission in neuronal and/or glial cells

LS5_2 Systems neuroscience and computational neuroscience (e.g. neural networks, neural modelling)

LS5_3 Neuronal development, plasticity and regeneration

LS5_4 Sensation and perception (e.g. sensory systems, sensory processing, pain)

LS5_5 Neural bases of cognitive processes (e.g. memory, learning, attention)

LS5_6 Neural bases of behaviour (e.g. sleep, consciousness, addiction)

LS5_7 Neurological disorders (e.g. neurodegenerative diseases, seizures)

LS5_8 Psychiatric disorders (e.g. affective and anxiety disorders, autism, psychotic disorders)

LS5_9 Neurotrauma and neurovascular conditions (including injury, blood-brain barrier, stroke, neurorehabilitation)

LS6 Immunity and Infection

The immune system and related disorders, biology of infectious agents and infection, biological basis of prevention and treatment of infectious diseases

LS6_1 Innate immunity in animals and plants

LS6_2 Adaptive immunity

LS6_3 Regulation and effector functions of the immune response (e.g. cytokines, interferons and chemokines, inflammation, immune signalling, helper T cells, immunological memory, immunological tolerance, cell-mediated cytotoxicity, complement)

LS6_4 Immunological mechanisms in disease (e.g. autoimmunity, allergy, transplantation immunology, tumour immunology)

LS6_5 Biology of pathogens (e.g. bacteria, viruses, parasites, fungi)

LS6_6 Mechanisms of infection (e.g. transmission, virulence factors, host defences, immunity to pathogens, molecular pathogenesis)

LS6_7 Biological basis of prevention and treatment of infection (e.g. infection natural cycle, reservoirs, vectors, vaccines, antimicrobials)

LS6_8 Infectious diseases in animals and plants

LS7 Applied Medical Technologies, Diagnostics, Therapies and Public Health

Development of tools for diagnosis, monitoring and treatment of diseases, pharmacology, clinical medicine, regenerative medicine, epidemiology and public health

LS7_1 Imaging for medical diagnosis

LS7_2 Genetic tools for medical diagnosis

LS7_3 Other medical technologies for diagnosis and monitoring of diseases

LS7_4 Pharmacology and pharmacogenomics (including drug discovery and design, drug delivery and therapy, toxicology)

LS7_5 Applied gene and cell therapies, regenerative medicine

LS7_6 Radiation therapy

LS7_7 Analgesia and surgery

LS7_8 Epidemiology and public health

LS7_9 Environmental health, occupational medicine

LS7_10 Health services, health care research, medical ethics

LS8 Ecology, Evolution and Environmental Biology

Population, community and ecosystem ecology, evolutionary biology, behavioural ecology, microbial ecology

LS8_1 Ecosystem and community ecology, macroecology

LS8_2 Biodiversity, conservation biology, conservation genetics

LS8_3 Population biology, population dynamics, population genetics

LS8_4 Evolutionary ecology

LS8_5 Evolutionary genetics

LS8_6 Phylogenetics, systematics, comparative biology

LS8_7 Macroevolution, palaeobiology

LS8_8 Coevolution, biological mechanisms and ecology of species interactions (e.g. symbiosis, parasitism, mutualism, food-webs)

LS8_9 Behavioural ecology and evolution

LS8_10 Microbial ecology and evolution

LS8_11 Marine biology and ecology

LS9 Applied Life Sciences, Biotechnology, and Molecular and Biosystems Engineering

Applied plant and animal sciences, forestry, food sciences, applied biotechnology, environmental and marine biotechnology, applied bioengineering, biomass and biofuels, biohazards

LS9_1 Applied biotechnology (including transgenic organisms, applied genetics and genomics, biosensors, bioreactors, microbiology, bioactive compounds)

LS9_2 Applied bioengineering, synthetic biology, chemical biology, nanobiotechnology, metabolic engineering, protein and glyco-engineering, tissue engineering, biocatalysis, biomimetics

LS9_3 Applied animal sciences (including animal breeding, veterinary sciences, animal husbandry, animal welfare, aquaculture, fisheries, insect gene drive)

LS9_4 Applied plant sciences (including crop production, plant breeding, agroecology, forestry, soil biology)

LS9_5 Food sciences (including food technology, food safety, nutrition)

LS9_6 Biomass production and utilisation, biofuels

LS9_7 Environmental biotechnology (including bioindicators, bioremediation, biodegradation)

LS9_8 Biohazards (including biological containment, biosafety, biosecurity)

LS9_9 Marine biotechnology (including marine bioproducts, feed resources, genome mining)

Social Sciences and Humanities

SH1 Individuals, Markets and Organisations

Economics, finance and management

SH1_1 Macroeconomics; monetary economics; economic growth

SH1_2 International management; international trade; international business; spatial economics

SH1_3 Development economics, health economics, education economics

SH1_4 Financial economics; banking; corporate finance; international finance; accounting; auditing; insurance

SH1_5 Labour and demographic economics; human resource management

SH1_6 Econometrics; operations research

SH1_7 Behavioural economics; experimental economics; neuro-economics

SH1_8 Microeconomics; game theory

SH1_9 Industrial organisation; strategy; entrepreneurship

SH1_10 Management; marketing; organisational behaviour; operations management

SH1_11 Technological change, innovation, research & development

SH1_12 Agricultural economics; energy economics; environmental economics

SH1_13 Public economics; political economics; law and economics

SH1_14 Competition law, contract law, trade law, Intellectual Property Rights

SH1_15 Quantitative economic history and history of economics; institutional economics; economic systems

SH2 Institutions, Values, Environment and Space

Political science, law, sustainability science, geography, regional studies and planning

SH2_1 Political systems, governance

SH2_2 Democratisation and social movements

SH2_3 Conflict resolution, war, peace building

SH2_4 Constitutions, human rights, comparative law, humanitarian law, anti-discrimination law

SH2_5 International relations, global and transnational governance

SH2_6 Sustainability sciences, environment and resources

SH2_7 Environmental and climate change, societal impact and policy

SH2_8 Energy, transportation and mobility

SH2_9 Urban, regional and rural studies

SH2_10 Land use and regional planning

SH2_11 Human, economic and social geography

SH2_12 GIS, spatial analysis; big data in political, geographical and legal studies

SH3 The Social World, Diversity, Population

Sociology, social psychology, social anthropology, demography, education, communication

SH3_1 Social structure, social mobility

SH3_2 Inequalities, discrimination, prejudice, aggression and violence, antisocial behaviour

SH3_3 Social integration, exclusion, prosocial behaviour

SH3_4 Attitudes and beliefs

SH3_5 Social influence; power and group behaviour

SH3_6 Kinship; diversity and identities, gender, interethnic relations

SH3_7 Social policies, welfare

SH3_8 Population dynamics; households, family and fertility

SH3_9 Health, ageing and society

SH3_10 Religious studies, ritual; symbolic representation

SH3_11 Social aspects of learning, curriculum studies, educational policies

SH3_12 Communication and information, networks, media

SH3_13 Digital social research

SH3_14 Science and technology studies

SH4 The Human Mind and Its Complexity

Cognitive science, psychology, linguistics, philosophy of mind

SH4_1 Cognitive basis of human development and education, developmental disorders; comparative cognition

SH4_2 Personality and social cognition; emotion

SH4_3 Clinical and health psychology

SH4_4 Neuropsychology

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

SH4_12 Philosophy of mind, philosophy of language

SH4_13 Philosophy of science, epistemology, logic

SH5 Cultures and Cultural Production

Literature, philology, cultural studies, study of the arts, philosophy

SH5_1 Classics, ancient literature and art

SH5_2 Theory and history of literature, comparative literature

SH5_3 Philology and palaeography

SH5_4 Visual and performing arts, film, design

SH5_5 Music and musicology; history of music

SH5_6 History of art and architecture, arts-based research

SH5_7 Museums, exhibitions, conservation and restoration

SH5_8 Cultural studies, cultural identities and memories, cultural heritage

SH5_9 Metaphysics, philosophical anthropology; aesthetics

SH5_10 Ethics; social and political philosophy

SH5_11 History of philosophy

SH5_12 Computational modelling and digitisation in the cultural sphere

SH6 The Study of the Human Past

Archaeology and history

SH6_1 Historiography, theory and methods in history, including the analysis of digital data

SH6_2 Classical archaeology, history of archaeology

SH6_3 General archaeology, archaeometry, landscape archaeology

SH6_4 Prehistory, palaeoanthropology, palaeodemography, protohistory

SH6_5 Ancient history

SH6_6 Medieval history

SH6_7 Early modern history

SH6_8 Modern and contemporary history

SH6_9 Colonial and post-colonial history

SH6_10 Global history, transnational history, comparative history, entangled histories

SH6_11 Social and economic history

SH6_12 Gender history; cultural history; history of collective identities and memories

SH6_13 History of ideas, intellectual history, history of economic thought

SH6_14 History of science, medicine and technologies