

## Discipline Committee 2 (DC2) – Physical Sciences – Panel Specialization

### P202 Mathematics and Computer Science

*The panel evaluates projects in all areas of mathematics, pure and applied, and projects in computer science that are predominantly theoretical in nature.*

- 202-01 Logic and Foundations of Mathematics
- 202-02 Algebra
- 202-03 Number Theory
- 202-04 Topology, Geometry and Global Analysis
- 202-05 Analysis and Functional Analysis
- 202-06 Ordinary and Partial Differential Equations
- 202-07 Probability and Mathematical Statistics
- 202-08 Numerical Mathematics
- 202-09 Applications of Mathematics in the Natural Sciences
- 202-10 Applications of Mathematics in Technology and Social Sciences
- 202-11 Discrete Mathematics and Combinatorics
- 202-12 Mathematical Control Theory, Optimization and Operations Research
- 202-13 Theoretical Computer Sciences, Programming Languages, Game Theory
- 202-14 Algorithms, Data Structures and Models, Theory of Big Data
- 202-15 Cryptology, Computer Security, Quantum Cryptography
- 202-16 Artificial Intelligence, Machine Learning, Neural Networks
- 202-17 Quantum Computing
- 202-18 Bioinformatics, Chemoinformatics, Astroinformatics
- 202-19 Modelling, Simulation and Scientific Computing
- 202-20 Computer Graphics, Data and Information Visualization

### P203 Nuclear and Particle Physics, Astronomy and Astrophysics

Panel P203 evaluates projects which utilize experimental and theoretical methods to address physical problems in general relativity, quantum field theory, atomic, nuclear and particle physics, statistical physics, quantum computing and related fields. The panel also evaluates projects which concern particle physics and interactions between particles, structure of nuclei, nuclear processes and the behaviour of particles in nuclear environment. It focuses on the development of new radioanalytical and

detection methods, when they lead to specific objectives set by atomic, particle or nuclear physics.

The panel also includes projects in theoretical physics, astrophysics, cosmology, stellar and solar physics. Furthermore, it contains the physics of the interplanetary environment, solar wind, planets and other solar system bodies and their interactions.

### **P204 Condensed Matter and Material Physics, Plasma Physics and Low Temperature Physics**

Panel P204 covers basic research projects in condensed matter and materials physics, based on both advanced experiments and theoretical approaches and simulations or a combination of both. This includes projects examining the physical properties of solids, liquids, condensates, and gases at low and very low temperatures. The panel also covers projects studying the properties of plasma and its interaction with solids. Therefore, it also includes projects studying thermonuclear fusion. Panel P204 does not cover projects focused clearly on applied research and projects focused only on building experimental facilities without an obvious innovative contribution from researchers, and which do not show any clear contribution to the progress in basic research within the submitted project.

### **P205 Biophysics, Macromolecular Physics and Optics**

The interdisciplinary panel P205 is responsible for basic research in the field of biophysics, macromolecular physics, and classical and quantum optics. The projects should be based on advanced experiments, theoretical approaches, simulations, or their combinations. An outcome of the projects is expected to extend the knowledge in the aforementioned fields of physics and lead to publications in international scientific journals, or patents when appropriate.

The panel P205 does not support projects of applied research and projects aimed at building experimental facilities with no obvious innovative contribution from the researchers and, no use of such facilities for research activities within the project.

### **P206 Analytical Chemistry – Chemical and Structural Analysis of Atomic, Molecular and (Bio) Molecular Systems**

P206 panel focuses on the latest analytical measurement concepts and new directions for improvement accuracy, selectivity, sensitivity and reproducibility in chemical and structural analysis (including bioanalysis) using microfluidics and nanotechnology,

electrochemical, separation and spectroscopic methods and combinations thereof; experimental studies of the structure of molecules, (bio)macromolecules and the systems formed from them (X-ray structural analysis, spectroscopy, mass spectrometry, etc.).

### **P207 Chemical and Biochemical Transformations**

Panel P207 covers basic chemical and biochemical research projects, *i.e.*, projects in inorganic, coordination, organometallic and organoelement chemistry, organic, bioorganic and medicinal chemistry, and biochemistry focused on the preparation of chemical compounds and on the study of molecular transformations in stoichiometric and catalysed processes. Anticipated outcome of such projects is a non-trivial extension of existing knowledge in a particular field, which is presented in the form of publications in international peer-reviewed journals, possibly patents. Panel P207 does not cover applied research projects and projects in the field of chemical technology and materials chemistry, and projects focused exclusively on theoretical chemical studies and molecular biology, which are considered by other panels.

### **P208 Chemical Physics and Physical Chemistry**

It is an interdisciplinary panel, which includes issues using the knowledge and methods of physics and chemistry (both theoretical and experimental) to investigate and explain the properties of individual molecules and clusters of molecules and their interaction with each other, and the relationship between the structure (or composition) of and the macroscopic properties of substances. Specifically, this includes: quantum chemistry (and related theoretical disciplines in the areas of chemical reactivity and spectroscopy); chemical thermodynamics condensed phases and gas; statistical thermodynamics and molecular simulation; chemical kinetics (reaction mechanisms and potential energy surfaces, reaction dynamics); development of new physicochemical experimental methods. The systems investigated are not specified/limited, only as far as the system is related to (bio)macromolecules, then this falls under Panel P205 except in cases where it is more about the methodology of simulations than about the study of the systems themselves.

### **P209 Atmospheric Sciences, Hydrology, Physical Geography and Geophysics**

The panel includes projects studying the physics of the atmosphere, including the upper layers and the atmospheres of other planets, projects in meteorology including

atmospheric pollution and atmospheric aerosols, climatology including historical climatology, paleoclimatology and climate change scenarios. Projects in hydrology including hydroecology. Projects in physical geography, integrating other disciplines such as pedology, geomorphology and the study of the cryosphere. Projects in geophysics, the Earth's magnetosphere, the influence of solar activity on Earth processes and geophysical processes of other planets, geographic cartography and geodesy.

### **P210 Geochemistry, geology and mineralogy, hydrogeology**

Panel P210 covers the basic research projects in the Earth sciences listed in the panel title, including all their fields and subfields, as well as palaeontology. Interdisciplinary projects must involve research that includes at least in part the rock or soil environment, or geological evolution and history of Earth.