SPECIALIZACE PANELU GA ČR OK2 - Vědy o neživé přírodě

(od 1. dubna 2025)

Matematika a informatika (Mathematics and Computer Science) - P202

- Logic and foundations
- Algebra
- Number theory
- Algebraic and complex geometry
- Lie groups, Lie algebras
- Geometry and global analysis
- Topology
- Analysis
- Operator algebras and functional analysis
- Ordinary differential equations and dynamical systems (in the mathematical sense)
- Theoretical aspects of partial differential equations
- Mathematical physics
- Probability
- Mathematical statistics
- Generic statistical methodology and modelling
- Discrete mathematics and combinatorics
- Mathematical aspects of computer science
- Numerical analysis
- Mathematical aspects of scientific computing and data processing
- Optimisation and operational research, foundations of control theory
- Application of mathematics in sciences
- Application of mathematics in industry and society
- Operating systems
- Distributed systems, parallel computing
- Software engineering, programming languages and systems
- Theoretical computer science, formal methods, automata
- Security, privacy, cryptology, quantum cryptography
- Algorithms and complexity, distributed, parallel and network algorithms, algorithmic game theory
- Foundations of artificial intelligence, intelligent systems, natural language processing
- Computer graphics, multimedia
- Foundations of machine learning
- Foundations of scientific computing, simulation and modelling tools
- Foundations of bioinformatics, bio-inspired computing, and natural computing

Jaderná a částicová fyzika, astronomie a astrofyzika (Nuclear and Particle Physics, Astronomy and Astrophysics) - P203

- Theory of fundamental interactions
- Phenomenology of fundamental interactions
- Experimental particle physics with accelerators
- Experimental particle physics without accelerators
- Classical and quantum physics of gravitational interactions, alternative theories of gravity
- Nuclear, hadron and heavy ion physics
- Nuclear and particle astrophysics
- Electromagnetism
- Atomic, molecular physics
- Ultra-cold atoms and molecules
- Quantum information
- Thermodynamics
- Non-linear physics
- Metrology and measurement
- Equilibrium and non-equilibrium statistical mechanics: steady states and dynamics
- Solar physics – the Sun, solar wind and heliosphere
- Solar and planetary systems, interplanetary matter
- Solar–terrestrial relations, Space weather
- Exoplanetary science, formation and characterization of extrasolar planets
- Astrochemistry and astrobiology
- Interstellar medium and star formation
- Stars – stellar physics, stellar systems
- Our galaxy
- Galaxies – formation, evolution, clusters
- Cosmology and large-scale structure, dark matter, dark energy
- Relativistic astrophysics and compact objects
- Gravitational wave astronomy
- High-energy and particle astronomy
- Astronomical instrumentation and data, e.g. telescopes, detectors, techniques, archives, analyses

Fyzika kondenzovaných látek a materiálů, fyzika plazmatu a nízkých teplot (Condensed Matter and Material Physics, Plasma Physics and Low Temperature Physics) - P204

- Gas and plasma physics
- Mechanical and acoustical properties of condensed matter, lattice dynamics
- Transport properties of condensed matter
- Electronic properties of materials, surfaces, interfaces, nanostructures
- Physical properties of semiconductors and insulators
- Macroscopic quantum phenomena, e.g. superconductivity, superfluidity, quantum Hall effect
- Spintronics
- Magnetism and strongly correlated systems

- Condensed matter – beam interactions (photons, electrons, etc.)
- Nanophysics, e.g. nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics
- Mesoscopic quantum physics and solid-state quantum technologies
- Fluid dynamics (physics)
- Surface science and nanostructures
- Thin films
- New materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles
- Cold atomic and molecular condensates
- Interaction of high-power laser light with matter
- Plasma assisted surface modification

Biofyzika, makromolekulární fyzika a optika (Biophysics, Macromolecular Physics and Optics) - P205

- Biophysics
- Physics of biological systems
- Computer simulations of biomolecules
- Physics of macromolecules
- Optics, non-linear optics and nano-optics
- Quantum optics
- Lasers, ultra-short lasers and laser physics

Analytická a fyzikální chemie (Analytical and Physical Chemistry) - P206

- Analytical chemistry, chemical theory
- Spectroscopic and spectrometric analytical techniques, and optical methods of analysis
- Analytical chemistry: molecular architecture and structure
- Analytical separation techniques
- Analytical chemistry: instrumentation
- Electrochemistry, electrodialysis, microfluidics, sensors
- Method development in analytical chemistry
- Analysis of chemical structure of materials
- Applications of machine learning and statistical analysis in analytical chemistry
- Molecular electronics
- Physical chemistry of soft matter (gels, colloids, liquid crystals), granular matter, liquids, glasses, defects
- Statistical physics: phase transitions, condensed matter systems, models of complex systems,
- interdisciplinary applications
- Physical chemistry
- Theoretical methods and approaches in spectroscopy
- Physical chemistry of interfaces
- Chemical physics

- Method development in physical chemistry
- Heterogeneous catalysis
- Methodology of computer simulations of biomolecules, physical chemistry of biomolecules, biomacromolecular chemistry
- Chemical kinetics
- Theoretical and computational chemistry
- Radiation and Nuclear chemistry
- Photochemistry
- Characterisation methods of materials
- Structural properties of materials in terms of physical chemistry
- Solid state materials chemistry
- Surface modifications by self-assembly and other cold processes
- Ionic liquids
- Intelligent materials synthesis – self assembled materials
- Colloid chemistry
- Physical chemistry of macromolecules

Chemické a biochemické přeměny (Chemical and Biochemical Transformations) - P207

- Chemical reactions – mechanisms and catalytic reactions
- Photochemistry – chemical transformations
- Coordination chemistry
- Biological chemistry and chemical biology – chemical transformations
- Homogeneous catalysis
- Macromolecular chemistry – synthesis and reactivity
- Polymer chemistry – chemical transformations
- Supramolecular chemistry – chemical transformations
- Organic chemistry
- Inorganic chemistry
- Organometallic chemistry
- Medicinal chemistry

Vědy o atmosféře, hydrologie, fyzická geografie a geofyzika (Atmospheric Sciences, Hydrology, Physical Geography and Geophysics) - P209

- Atmospheric chemistry, atmospheric composition, air pollution
- Meteorology, atmospheric physics and dynamics
- Climatology, palaeoclimatology and climate change
- Tectonophysics, physics of earth's interior, seismology, core and mantle dynamics
- Physical geography, geomorphology, oceanography
- Earth observations from space/remote sensing
- Geomagnetism
- Ozone, upper atmosphere, ionosphere
- Hydrology, contaminant hydrology, soil hydrology, soil physics
- Cryosphere, dynamics of snow and ice cover, sea ice, permafrosts and ice sheets

Planetary geophysics Geochemie, geologie a mineralogie, hydrogeologie (Geochemistry, geology and mineralogy, hydrogeology) - P210

- Biogeochemistry, biogeochemical cycles, environmental chemistry
- Mineralogy, petrology, igneous petrology, metamorphic petrology
- Geochemistry, cosmochemistry, crystal chemistry, isotope geochemistry, thermodynamics
- Geology, geotectonics, volcanology
- Palaeoclimatology, palaeoecology
- Lithosphere dynamics
- Geological oceanography
- Sedimentology, paleontology, stratigraphy, pedology, paleopedology, soil chemistry
- Palaeomagnetism
- Hydrogeology, environmental geology, soil contamination
- Planetary geology