

**Research topics in the discipline of physical sciences
in the academic year 2020/2021**

Lp.	PhD Supervisor	ORCID	Contact	Research topics
1	prof. dr. hab. Stanisław Mrówczyński	0000-0002-5943-698X	stanislaw.mrowczynski@ncbj.gov.pl	<ol style="list-style-type: none"> 1. Physics of the quark-gluon plasma 2. Models of heavy ion collisions
2	prof. dr hab. Wojciech Broniowski	0000-0002-9711-7234	wojciech.broniowski@ujk.edu.pl	<p>Theory of ultra-relativistic nuclear collisions at the LHC and RHIC:</p> <ul style="list-style-type: none"> - Analysis of the initial state in collisions of light nuclei - Higher-order cumulants of longitudinal correlations in a string model
3	dr hab. Aldona Kubala-Kukuś	0000-0003-1547-3348	a.kubala-kukus@ujk.edu.pl	Investigation of the material properties using the low-angle X-ray spectroscopy
4	prof. dr hab. Zbigniew Włodarczyk	0000-0002-5602-9692	zbigniew.wlodarczyk@ujk.edu.pl	Phenomenological description of production processes in heavy-ion collisions
5	dr hab. prof. UJK Tadeusz Kosztołowicz	0000-0001-5710-2970	tadeusz.kosztolowicz@ujk.edu.pl	<ol style="list-style-type: none"> 1. Models of anomalous diffusion 2. Applications of differential equation with fractional order to the modeling of physical processes 3. Application of stochastic models and equations to the description of physical processes
6	prof. dr hab. Marek Pajek	0000-0002-3888-5209	marek.pajek@ujk.edu.pl	<ol style="list-style-type: none"> 1. Interactions of highly charged ions with surfaces 2. Recombination processes of ions with electrons in the plasma 3. Molecular fragmentation from electron collisions 4. Study of exotic atoms using methods based on Roengen spectroscopy 5. Study of scattering processes from synchrotron radiation 6. Study of different materials by using electron spectroscopy

				7. Study of surfaces using methods of photoelectronic spectroscopy
7	dr hab. prof. UJK Francesco Giacosa	0000-0002-7290-9366	fgiacosa@ujk.edu.pl	<ol style="list-style-type: none"> 1. Unconventional mesons: glueballs and tetraquarks 2. Restoration of chiral symmetry at nonzero temperature and density in effective models of QCD 3. Modeling the measurement process in quantum mechanics 4. Non-exponential decay in Quantum Mechanics and in Quantum Field Theory
8	prof. dr hab. Janusz Braziewicz	0000-0002-6972-7027	j.braziewicz@ujk.edu.pl	<ol style="list-style-type: none"> 1. Investigation of properties of materials by using the method of X-ray fluorescence spectroscopy 2. DNA fragmentation in scattering with electrons and heavy ions 3. Study of the interactions of heavy ions with biological materials 4. Monitoring the deposition of a proton beam in hadron therapy
9	prof. dr hab. Marek Gaździcki	0000-0002-6114-8223	marek.gazdzicki@ujk.edu.pl	Study of relativistic heavy ion collisions
10	dr hab. prof. UJK Maciej Rybczyński	0000-0002-3638-3766	maciej.rybczynski@ujk.edu.pl	Fluctuations and correlations in particle production processes
11	dr hab. prof. UJK Dariusz Banaś	0000-0003-1566-5446	dariusz.banas@ujk.edu.pl	<ol style="list-style-type: none"> 1. Study of the structure of materials by using the method of X-ray diffraction 2. Study of the structure of materials by using the method of X-ray photoelectron spectroscopy 3. Study of surfaces by using the method of X-ray reflection 4. Study of surfaces by using microscopic scanning methods

12	dr. hab. prof. UJK Grzegorz Stefanek	0000-0001-6656-9177	grzegorz.stefanek@ujk.edu.pl	Study of particle distributions and correlations in nuclear collisions [Badanie rozkładów i korelacji cząstek w zderzeniach jądrowych]
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