

Department of Fundamental Research (DBP) in 2021

Structure

Nuclear Physics Division (BP1)

head - prof. dr. hab. Zygmunt Patyk

*nuclear structure and nuclear reactions
at low and intermediate energies*

Theoretical Physics Division (BP2)

head - dr. hab. Michał Kowal

*nuclear physics from low to high energies,
physics of elementary particles,
QCD, field theory, astrophysics, cosmology,
classical and quantum gravity*

High Energy Physics Division (BP3)

head - dr. hab. Justyna Łagoda

*experimental elementary particle physics
and experimental high-energy nuclear physics*

Astrophysics Division (BP4)

head – prof. dr. hab. Agnieszka Pollo

*observational cosmology and astrophysics,
experimental cosmic ray physics*

Employee of DBP

	DBP 2020		DBP 2021	
	people	jobs	people	jobs
prof. & dr. hab.	41(13)	29.4	39 (15)	27.5
dr	50	48.3	55	54.2
mgr	3	2.25	2	2
administration & technical stuff	8	8	8	8
all	102 (13)	87.9	104 (15)	91.7

2021	BP1		BP2		BP3		BP4	
	people	jobs	people	jobs	people	jobs	people	jobs
prof. & dr. hab.	4 (1)	3.1	16 (5)	12.9	11 (6)	6.2	7 (3)	4.6
dr	2	2	20	20	17	16.2	16	16
mgr	0	0	0	0	1	0	2	2
administration & technical stuff	2	2	0	0	0	0	3	3
all	8 (1)	7.1	35 (5)	32.9	28 (6)	22.4	28 (3)	25.6

33 Ph.D. students in 2021

27 Ph.D. students in 2020

* in brackets number of employee receiving pension

Promotions

2021

Doctorates: **0**
Habitations: **0**
Professorship: **1**

2020

Doctorates: **3**
Habitations: **5**
Professorship: **0**



Agnieszka Pollo

Research grants

2021

all grants: **59**

grants of NCN: **32**

MNiSW : **11**

UE, NCBiR, NAWA, others: **15**

2020

all grants: **49**

grants of NCN: **27**

MNiSW : **7**

UE, FNP, NCBiR, NAWA: **15**

Publications

2021

Peer-reviewed publications: **370**

- BP1: **17** (6 together with BP3)
- BP2: **130** (65 together with BP3)
- BP3: **207** (72 together with BP1, BP2 or BP4)
- BP4: **88** (1 together with BP3)

2020

Peer-reviewed publications: **350**

- BP1: **20** (9 together with BP2, BP3 or BP4)
- BP2: **101** (48 together with BP1 or BP3)
- BP3: **219** (53 together with BP1, BP2 or BP4)
- BP4: **72** (5 together with BP1 or BP3)

Main fields of research

Experimental physics

- High-energy particle physics – experiments CMS & LHCb, 14*
- Neutrino physics – experiments T2K, SK, km3net, Hyper-K, DUNE, 10
- High-energy nuclear physics – experiments ALICE, NA61/SHINE, MPD@NICA, 5
- High-energy lepton-hadron interactions – experiment COMPASS, 3
- Hadron physics – experiments WASA & KLOE-2, 5
- Observational cosmology – projects VIPERS, VVDS, AKARI, Planck, 8
- Observational astrophysics – LIGO-Virgo, 5
- Cosmic ray physics – experiments JEM-EUSO, 7
- Nuclear structure – experiments @ GSI and @ U200, 4
- Nuclear reactions at low and intermediate energies, 5

* approximate number of physicists involved

Main fields of research cont.

Theoretical physics

- Structure and dynamics of atomic nuclei (superheavy and exotic), 4*
- Interactions and structure of hadrons, QCD, 10
- Cosmological models, classical and quantum gravity, 8
- Physics beyond Standard Model and dark matter, 9
- String theory, 3
- Ultra-cold atomic gases, 2

* approximate number of physicists involved

Presentations of main research achievements of 2021

presentation	speaker
<i>The Higgs boson in the mirror</i>	Michał Bluj
<i>Spin density matrix elements in exclusive vector meson muoproduction at COMPASS</i>	Andrzej Sandacz
<i>$\eta \rightarrow \pi^0 \gamma \gamma$ analysis in KLOE experiment</i>	Marcin Berłowski
<i>CP-symmetry tests in sequential decays of entangled strange baryons</i>	Andrzej Kupść
<i>Recent results from KM3NeT neutrino telescopes</i>	Piotr Kalaczyński
<i>The earliest phase of relativistic heavy-ion collisions</i>	Alina Czajka
<i>Massive quarks at one loop in the dipole picture of Deep Inelastic Scattering</i>	Guillaume Beuf
<i>Freeze-in dark matter production from semi-annihilations</i>	Maxim Laletin
<i>Hydrodynamic attractors in ultrarelativistic nuclear collisions</i>	Michał Spaliński
<i>A new generic and structurally stable cosmological model without singularity</i>	Orest Hrycyna
<i>The power of MULTI-wavelength astrophysics: using optical-radio data to uncover properties of star-forming galaxies in the Universe</i>	Katarzyna Małek
<i>Dark matter viscosity and gravitational waves</i>	Marek Biesiada
<i>JEM-EUSO — towards space-based ultrahigh energy cosmic ray observatory</i>	Kenji Shinozaki
<i>Galaxy Mergers: Identification and Classification</i>	William Pearson
<i>Diffusion as a possible mechanism controlling the production of superheavy nuclei in cold fusion reactions</i>	Tomasz Cap