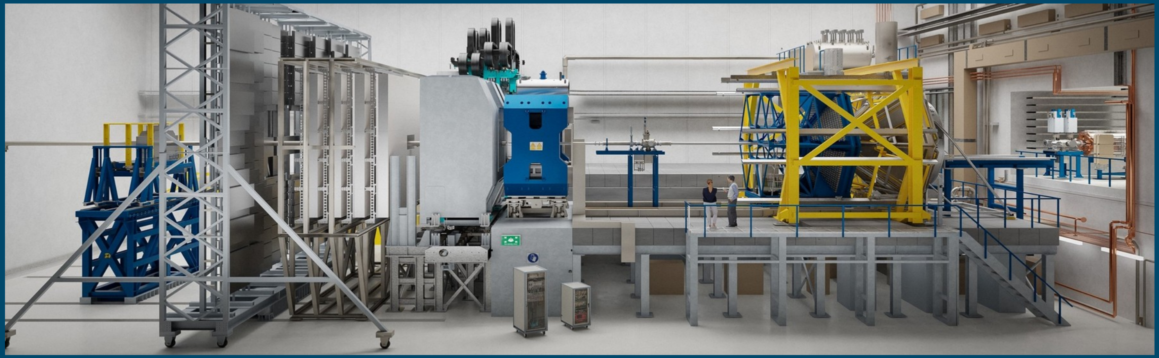
THE HENRYK NIEWODNICZAŃSKI
INSTITUTE OF NUCLEAR PHYSICS
POLISH ACADEMY OF SCIENCES

IFJ PAN joining the CBM Collaboration



Izabela Ciepał

4th March 2026

- **1955** – foundation of the IFJ
- **2025** – 70th birthday
- the largest institute of the Polish Academy of Sciences (PAS)
- the A+ category in the discipline of physical sciences by the Ministry of Education and Science
- the Leading National Research Centre (KNOW) for the years 2012–2017
- the prestigious distinction of “HR Excellence in Research” by European Commission
- PhD studies - most pro-doctoral PAS institute (2023), also: ERASMUS, etc...

Instytut kategorii A+

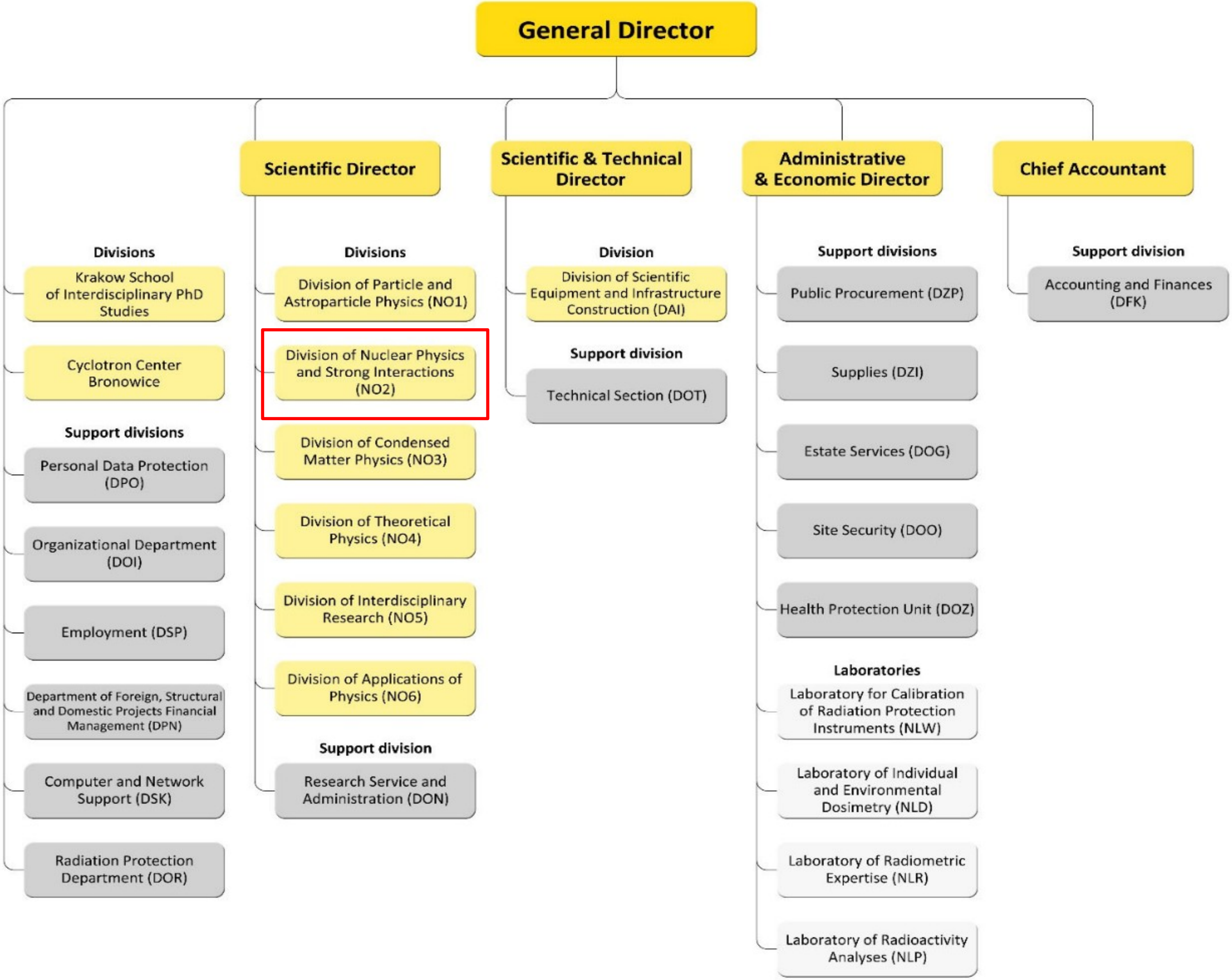
HR EXCELLENCE IN RESEARCH

Participation in large-scale experiments:

- CERN (ALICE, ATLAS, LHCb, NA61/SHINE) – since 50 years
- Facility for Antiproton and Ion Research (**FAIR**, Darmstadt)
- European Spallation Source (ESS, Lund, Sweden)
- Système de Production d’Ions Radioactifs Accélérés en Ligne (SPIRAL2, GANIL, Caen, France),
- Cherenkov Telescope Array (CTA),
- European Laser on Free Electrons (E-XFEL, DESY, Hamburg)
- Pierre Auger Observatory (Argentina),
- International Thermonuclear Experimental Reactor (ITER, Cadarache, France),
- T2K neutrino experiment (Japan)
- Belle2 experiment (KEK, Tsukuba, Japan)

KISD
KRAKOW SCHOOL
OF INTERDYSCIPLINARY
PHD STUDIES

IFJ PAN ORGANIZATIONAL STRUCTURE DIAGRAM



General Director

- **Divisions**
  - Krakow School of Interdisciplinary PhD Studies
  - Cyclotron Center Bronowice
- **Support divisions**
  - Personal Data Protection (DPO)
  - Organizational Department (DOI)
  - Employment (DSP)
  - Department of Foreign, Structural and Domestic Projects Financial Management (DPN)
  - Computer and Network Support (DSK)
  - Radiation Protection Department (DOR)

Scientific Director

- **Divisions**
  - Division of Particle and Astroparticle Physics (NO1)
  - Division of Nuclear Physics and Strong Interactions (NO2)
  - Division of Condensed Matter Physics (NO3)
  - Division of Theoretical Physics (NO4)
  - Division of Interdisciplinary Research (NO5)
  - Division of Applications of Physics (NO6)
- **Support division**
  - Research Service and Administration (DON)

Scientific & Technical Director

- **Division**
  - Division of Scientific Equipment and Infrastructure Construction (DAI)
- **Support division**
  - Technical Section (DOT)

Administrative & Economic Director

- **Support divisions**
  - Public Procurement (DZP)
  - Supplies (DZI)
  - Estate Services (DOG)
  - Site Security (DOO)
  - Health Protection Unit (DOZ)
- **Laboratories**
  - Laboratory for Calibration of Radiation Protection Instruments (NLW)
  - Laboratory of Individual and Environmental Dosimetry (NLD)
  - Laboratory of Radiometric Expertise (NLR)
  - Laboratory of Radioactivity Analyses (NLP)

Chief Accountant

- **Support division**
  - Accounting and Finances (DFK)

NO2 - Scientific Departments:

Division Head: Prof. Andrzej Rybicki

- **Theory of Strong Interactions and Many Body Systems (NZ21)**
  - head: Prof. dr hab. Antoni Szczurek
- **Structure of Atomic Nucleus (NZ22)**
  - head: Prof. dr hab. Piotr Bednarczyk
- **Ultrarelativistic Nuclear Physics and Hadron Interactions (NZ23)**
  - head: Prof. dr hab. Marek Kowalski
- **Nuclear Reactions and Hadronic Processes (NZ24)**
  - head: dr hab. Adam Kozela

Staff: 38
Researchers: 36
PhD Students: 6

- ➔ **GSI/FAIR:** HADES, ALADIN, SpALADIN, ASY-EOS, ASY_EOS II, NUSTAR
- ➔ **CERN:** ALICE, NA61/SHINE
- ➔ ESS Lund
- ➔ SPIRAL2, GANIL

Group activities and scientific interests:

- nuclear reaction mechanisms, including processes occurring at ultra-relativistic energies
- the nuclear matter equation of state ((Sp)ALADIN, ASY-EOS)
- fundamental symmetries of interaction
- HADES hadron, di-electrons, exclusive physics with π/p+p, π/p +A

People:

Experimentalists:

1. Piotr Pawłowski - connected with GSI: ALADIN, SpALADIN, ASY-EOS, and ASY_EOS II, Chief Specialist for Research Equipment at IFJ, DAQ and software expert
2. Szymon Treliński, PhD student in HADES,
3. PostDoc1 (will be hired in April 2026),
4. PostDoc2 (will be hired in July 2026),
5. Iza Ciepał, Professor at IFJ PAN, working in HADES since 2016

Theorists:

Prof. Antoni Szczurek – calculations for CERN, FAIR, UPC, spectator EM effects, charm, etc..

Contributions to CBM:

- Piotr Pawłowski - preparation of DOGMA system for readout of LHCb straws in the MUCH detector and software development (collaboration with G. Korcyl JU) – FTE: 40%

- Szymon Treliński – FTE: 20→ 100%
- PostDoc1 – FTE: 30→ 100%
- PostDoc2 – FTE: 100%
- Iza Ciepał – FTE: 50→ 90%

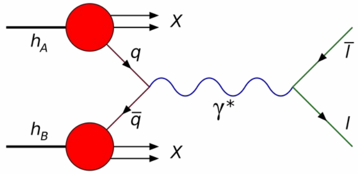
performing feasibility study with simulations
PWGExclusive group
(Johan Messchendorp & Frank Nerling)

➔ **Note:** the FTE is expected to increase as indicated above after fulfillment of our immediate obligations in HADES

- Prof. Antoni Szczurek (theory group) – charm production at CBM energies in p+p collisions, Drell -Yan (PRODY Hadron2030, T. Galatyuk)

Physics interest - contributions to CBM:

1. studies of inclusive production of charmed mesons D/Dbar in p+p collisions, ratio barions-to-mesons Λ_c/D, important for color reconnection, intrinsic charm for large rapidity (in collaboration with A. Szczurek)
2. Drell-Yan physics (in collaboration with A. Szczurek)

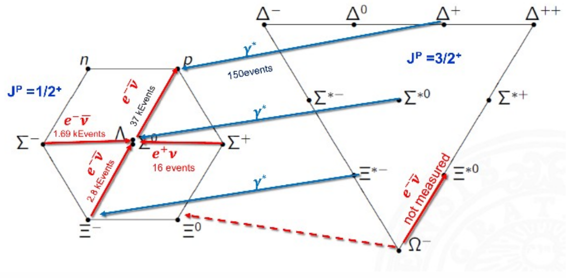


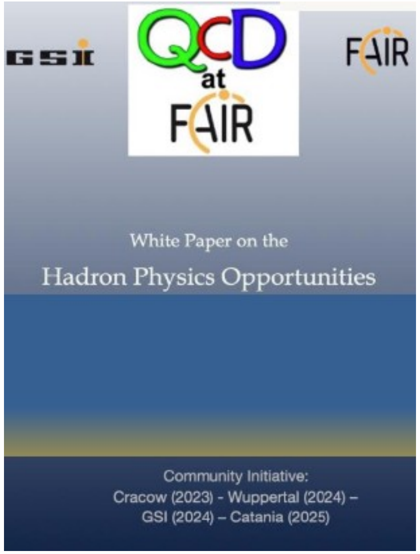
3. leptonic and semi-leptonic hyperon decays and form factors:

$pp \rightarrow pK^+\Lambda(1520) \rightarrow pK^+\Lambda\, e^+e^-$

$pp \rightarrow p\, \Xi^-\, K^+ K^-,\ \Xi \rightarrow \Lambda\, e^- \nu$

$pp \rightarrow pK^+\Lambda,\ \ \Lambda \rightarrow p\, e^-\, \nu$




GSI

QCD at FAIR

FAIR

White Paper on the
Hadron Physics Opportunities

Community Initiative:
Cracow (2023) - Wuppertal (2024) –
GSI (2024) – Catania (2025)

➔ **IFJ PAN applies for full membership in the CBM collaboration**