NEWSLETTER

The Henryk Niewodniczański Institute of Nuclear Physics
Polish Academy of Sciences

IN THIS EDITION (VII-X 2023)

The IFJ PAN Newsletter is available at this link:
www.ifj.edu.pl/instytut/biuletyn

HR EXCELLENCE IN RESEARCH

We cordially invite you to contribute to the next editions of our Newsletter!

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AWARDS AND DISTINCTIONS

IFJ PAN DIRECTOR'S AWARD FOR SCIENTIFIC AND ORGANIZATIONAL ACTIVITY

10th edition

- **dr Ewa Pięta** - for her leading contribution to the creation of a series of publications illustrating the development of advanced methods of oscillation spectroscopy in light of searches for innovative anti-cancer medicine
- **dr Natalia Piergies** - for her leading contribution to the creation of a series of publications illustrating an innovative use of the effect of surface plasmon resonance in the AFM-IR technique

"THE EUROPEAN BIOPHYSICS JOURNAL PRIZE 2023" AWARD

At the 14th EBSA Congress in Stockholm (31 July - 4 August 2023, Sweden), the IFJ PAN employees: **prof. Małgorzata Lekka, mgr Joanna Pabijan, dr hab. Katarzyna Pogoda and dr Joanna Zemła** were awarded the European Biophysics Journal Prize 2023 for their scientific paper **"Indenting soft samples (hydrogels and cells) with cantilevers possessing various shapes of probing tip"** published by the European Biophysics Journal with Biophysics Letters.

The publication is accessible at: www.link.springer.com/article/10.1007%2Fs00249-020-01456-7

REVIEW OF ACTIVITY JULY – OCTOBER 2023

- Appointment of **prof. Paweł Olko** as Director's Representative for nuclear energy. The tasks of the Representative include: initiation, supervision and coordination of IFJ PAN activities aiming at involving the Institute in the implementation of nuclear energy programs in Poland, representing IFJ PAN in contacts with units involved in the implementation of nuclear energy programs in Poland and in the Polish Radiological Protection Consortium.
- On September 20, 2023 the IFJ PAN Director signed an agreement with the Ministry of Education and Science on the implementation of a project within the framework of the Program "Support for the participation of Polish research teams in international projects of research infrastructures". The project entitled "Upgrade of the ALICE experiment towards studies on the electromagnetic component in the central region and forward physics in proton and atomic nuclei collisions" will be carried out in the years 2023-2027. The funds granted by the Ministry for the implementation of the project amount to PLN **23,160 606.00.**
- Update of "Procedures for the conferment of the title of professor and the post-doctoral title of doctor habilitated at IFJ PAN".
- Introduction of rules for the distribution of cryogenic liquids on the premises of IFJ PAN.
- Update of the webpage devoted to the popularization of science: www.ifj.edu.pl/popularyzacja/

PROTON THERAPY

At Bronowice Cyclotron Centre from July to September 2023, **88 patients** in total underwent proton irradiation, of whom 7 finished a cycle of irradiations at the ocular radiotherapy facility (eye cancer), while **63 adult and 18 pediatric patients** finished a cycle of irradiations at the gantry facility (cancers in different locations than the eye).

ELECTIONS TO THE DISCIPLINARY COMMITTEE

Calendor

Submission of candidates:

- From October 9 to 20, 2023

Elections:

- **October 30, 2023**

www.ifj.edu.pl/dla-pracownikow/komisje/komisja-dyscyplinarna/2023-2027/

ELECTIONS TO THE IFJ PAN SCIENTIFIC COUNCIL

Calendar

Submission of candidates:

- For Group A: from October 20 to November 27
- For Group B: from October 30 to November 27

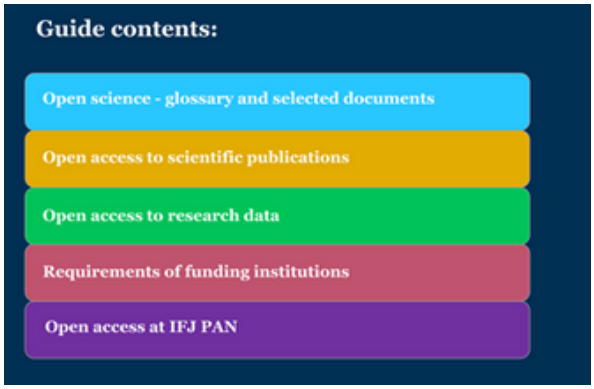
Elections:

- First ballot: **December 4, 2023**
- Second ballot: **December 11, 2023**

www.ifj.edu.pl/instytut/rada-naukowa/wybory/

ACTIVITIES FOR THE PROMOTION OF OPENNESS IN SCIENCE

- Publishing of the guide: "Open access to scientific publications and research data". The guide is divided into 5 parts and contains most important information on publishing open scientific papers, research data, guidelines of funding units and recommendations for authors.



The Guide is accessible at this link: www.ifj.edu.pl/library/open-access/materials/OTWARTY-DOSTEP-przewodnik-2023.pdf

- Update of the obligatory training ending with a test on Open Access for all employees and PhD students publishing articles in scientific journals and applying for research grants.

  The training and the test are available on https://net.ifj.edu.pl/login.php in the tab "Courses". We remind you that **the deadline for passing the test is October 25, 2023.**

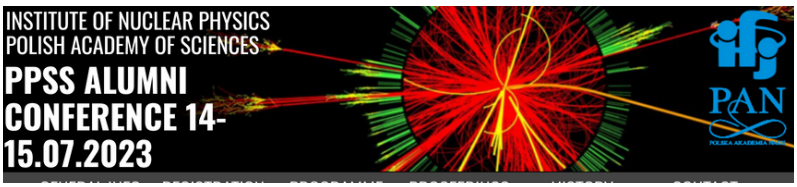
- All persons carrying out research and PhD students received an email message with an individual link to an anonymous survey on produced research data. The answers from the survey will be used to make plans and undertake appropriate actions for the implementation of the open science policy at IFJ PAN. **The link to the survey will be active till October 25, 2023.** We encourage you to take part in the survey.

CONFERENCES AND EVENTS

IFJ PAN PARTICLE PHYSICS SUMMER STUDENT PROGRAMME

From July 10 to August 4, 2023, the Institute of Nuclear Physics PAN organized student internships in the field of particle physics. This event was the 11th edition of the program, which has been held at IFJ PAN since 2018 under the name of "IFJ PAN Particle Physics Summer Student Programme". The goal of this undertaking is to promote particle physics among students, advertise IFJ PAN as an attractive place for pursuing research and demonstrate that scientific work may prove to be an attractive career path. In addition, projects carried out by students may constitute the basis for their future bachelor's, master's and doctoral theses.
This year we have observed a surge of interest in our internships – we received as many as 181 applications. 31 students were selected to participate in the event, including 17 from abroad. The participants completed 15 projects under the guidance of IFJ PAN mentors.

PPSS ALUMNI CONFERENCE 2023



On July 14 and 15, 2023, the Institute of Nuclear Physics PAN held a conference entitled IFJ PAN PPSS Alumni Conference 2023. The event gathered 59 participants, including 33 from abroad. The majority of the lecturers were the participants of previous editions of student internships known as IFJ PAN Particle Physics Summer Student Programme.

During the conference, the speakers summarized the course of their scientific careers and presented the results of their studies. Moreover, the event featured a presentation of the Krakow School of Interdisciplinary PhD Studies (KISD) and an hour-long lecture entitled "MSc Guide to High Energy Physics Experiments". There were two panel discussions held during the conference, the subject matter of which was related to the current status of research and the future of particle physics, the profession of a scientist, and scientific career development.

PPSS Programme coordinators:
Maciej Trzebiński, PhD, Rafał Staszewski, PhD, Dominik Derendarz, PhD

More information:
https://ppss.ifj.edu.pl/index.php

COLLABORATION WITH THE GEN GENERATOR OF SCIENCE

On September 30, 2023, 75 young enthusiasts in natural sciences began a new academic year at Jasło University for Children. The inaugural lecture was delivered by Prof. Katarzyna Mazurek, who used fruits in order to explain to children the nature of particles.
Jasło University for Children operates in connection with the implementation of the GEN Generator of Science project, whose scientific partner is the Institute of Nuclear Physics PAN. The cooperation with the GEN Generator of Science in Jasło makes it possible for pupils to establish contacts with the scientific community, among others through classes, workshops and other events promoting natural sciences, organized by IFJ PAN employees.

A MEETING OF THE COLLABORATION COUNCIL OF THE EUROPEAN SPALLATION SOURCE

A meeting of the Collaboration Council of the European Spallation Source, chaired by dr hab. Dariusz Bocian, IFJ PAN Scientific and Technical Director, since November 9, 2022, took place at the Institute of Nuclear Physics PAN on October 4, 2023.
The Collaboration Council is made up of ESS representatives and representatives of 18 scientific research institutes from 8 countries participating in the construction of the ESS accelerator. The participants held a multi-threaded and constructive debate on advancements in installation and commissioning of the ESS accelerator and discussed rare cases of potential dangers that could have an influence on timely commissioning of the ESS accelerator, scheduled for May 15, 2025.

SECOND ANNUAL MEETING OF EURO-LABS

The second annual EURO-LABS (European-Laboratories for Accelerator-Based Sciences) meeting was held on October 9-11, 2023. The event was organized by IFJ PAN, and the meeting was attended by about 80 guests, including 40 from foreign research centers. During the meeting, the completed work in the first year of EURO-LABS was analyzed and the strategy and goals for the next year were discussed.
EURO-LABS is a four-year project funded by the European Commission's Horizon Europe program. EURO-LABS provides effective access to a network of 47 research infrastructures to conduct curiosity-driven research, solve fundamental questions and technological challenges, and train the next generation of scientists.

WORKSHOP OF THE I.FAST EUROPEAN PROJECT DEDICATED TO INFRASTRUCTURES FOR BEAM TESTS OF ACCELERATOR COMPONENTS

On October 12, 2023, the Institute of Nuclear Physics PAN held a workshop of the European project I.FAST devoted to infrastructures for testing accelerator components with the use of particle beams.

The workshop was hosted by dr hab. Dariusz Bocian, IFJ PAN Scientific and Technical Director. Selected European infrastructures serving to irradiate accelerator components with particle beams were discussed at the workshop. During this part of the event, dr hab. Jan Swakoń presented the AIC-144 accelerator that has been at the disposal of IFJ PAN. Next, main applications of particle beams were summarized and the implementation of necessary improvements of the presented test infrastructures was discussed. A constructive debate on the rules for making beam time available to external entities, including industry, was also held at the meeting.

More information: https://ifast-project.eu/home

XFELS FOR BEGINNERS

On the 12th-13th of October 2023, the Institute of Nuclear Physics PAN together with the Institute of Physics PAN organized a workshop entitled: "XFELs for beginners", with the aim to familiarize young scientists with the subject of research and measurement methods at X-ray Free Electron Lasers. This was the third edition of these workshops.
During the workshop lectures were given by scientists working directly with XFEL facilities, i.e. prof. Serguei Molodtsov (Scientific Director of European XFEL), prof. Beata Ziaja-Motyka-Motyka, dr Sven Toleikis (FLASH, DESY), dr Richard Bean (Leading Scientist and Group Leader SPB/SFX, EuFEL), prof. Jerzy Antonowicz 9Warsaw University of Technology) and dr Wojciech Błachucki. During the workshop, a short course on the preparation of experiments for XFEL research was also conducted, using the laboratories of the Department of Applied Spectroscopy at the Institute of Nuclear Physics Polish Academy of Sciences in Krakow. The course was prepared by researchers from IFJ PAN and aimed to familiarize the workshop participants with the methods of sample preparation for research with X-ray lasers as well as with the use of high energy resolution X-ray spectroscopy setups.
The meeting was prepared in hybrid form and gathered 86 participants, 52 at IFJ PAN and 34 online. The participants represented different universities and research institutes, for example IFJ PAN, Jagiellonian University, Adam Mickiewicz University in Poznań, AGH University of Kraków, IChF PAN and Silesian University. Online participants were mostly from Sumy State University in Ukraine.

PHD STUDIES

RECRUITMENT FOR KISD

In July and September this year we conducted a recruitment procedure for the Kraków School of Interdisciplinary PhD Studies for the academic year 2023/2024. The recruitment was carried out with financial backing from subsidies of the entities running the PhD School, as well as from NCN (National Science Centre) grants and the "Doktorat Wdrożeniowy" program (Industrial Doctoral Program – Ministry of Education and Science). 56 candidates submitted applications to the PhD School, **27** of whom – to IFJ PAN. 27 candidates were admitted, 10 of whom – to IFJ PAN. 29 applications were submitted by non-nationals to KISD, and 9 candidates were accepted.

CEREMONIAL INAUGURATION OF THE ACADEMIC YEAR 2023/2024

The ceremonial inauguration of the academic year 2023/2024 took place on October 2 in the IFJ PAN Main Lecture Hall. The ceremony was attended by representatives of the units forming KISD, doctoral supervisors and PhD students. During the event first year doctoral students starting their education at the PhD School took their oaths, followed by lectures delivered by:

- prof. Tadeusz Lesiak – IFJ PAN Director
- prof. Bogdan Fornal – Deputy Director for Science
- dr hab. Mariola Kłusek-Gawenda – KISD Director
- mgr inż. Anna Nykiel from IFJ PAN and mgr Gabriela Pacek from the Jerzy Haber Institute of Catalysis and Surface Chemistry PAN – scholarship winners of the STER NAWA program – Internationalization of Doctoral Schools.

The authorities of the Institute, PhD School, and IFJ PAN PhD Student Government expressed their gratitude to prof. Andrzej Horzela for his invaluable contribution to doctoral education and for many years of supervision over PhD studies and the PhD school.

Prof. Andrzej Horzela was an IFJ PAN employee from 1980. In 1984 he started collaboration with the International Doctoral Studies (MSD) at IFJ PAN, acting as MSD Deputy Director, MSD Secretary, and MSD Scientific Secretary. In 2015 he was appointed MSD Director.

On behalf of IFJ PAN, prof. Andrzej Horzela was a coordinator of a number of projects related to PhD education, among others:

- New materials for future advanced technologies and energetics (ISD),
- Physical, chemical and biophysical foundations for modern technologies and materials engineering (FCB),
- Interdisciplinarity for innovative medicine (InterDokMed).

As a co-author or independent author, prof. Andrzej Horzela received grants supporting the process of PhD education:

- NAWA PROM – international scholarship exchange of PhD students and academic staff,
- NAWA STER – internationalization of doctoral schools,
- "Doktorat wdrożeniowy" (Industrial Doctoral Program) – 3rd edition,
- "Doktorat wdrożeniowy" (Industrial Doctoral Program) – 4th edition.

Prof. Andrzej Horzela was also involved in teaching and conducted the following courses:

- "Repetitory course on mathematics",
- "Theoretical physics for non-specialists",
- "The history of physics",
- "Elements of quantum mechanics",
- "Interdisciplinary aspects of physics",
- Doctoral seminar.

OVER 1 MILLION PLN SPENT ON INTERNATIONAL INTERNSHIPS WITHIN THE INTERNATIONALIZATION OF DOCTORAL SCHOOLS

Since 2020, IFJ PAN has been implementing the STER Program – Internationalization of doctoral schools that includes:

- Support for international mobility of the best PhD students from Poland and abroad receiving education at a PhD school,
- Organization of scientific stays for foreign visiting professors, supervisors and auxiliary supervisors running classes for PhD students or delivering guest lectures in foreign languages,
- Implementation of joint scientific projects in the field of PhD education,
- Activities related to attracting foreign PhD students.

Over 50 international internships at foreign universities and scientific centers were completed within the STER program. Their overall cost exceeded 1 million PLN. The STER program will be run until the end of 2023.

A booklet promoting the PROM program "Short trips – great possibilities" – p. 29-33 are devoted to the participation of KISD students in the program. www.nawa.gov.pl/images/Aktualnosci/2023/nawa-prom_net.pdf

OMBUDSMAN FOR PHD STUDENTS AND RULES FOR RESOLVING CONFLICT SITUATIONS

In September this year Mr. Michał Adamek from KISD was appointed to act as the Ombudsman for PhD students at IFJ PAN. The rules for resolving conflict situations in relation to the PhD students of the Kraków School of Interdisciplinary PhD Studies pursuing a research topic at the Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences were also implemented. The appointment of the Ombudsman and the introduction of the Rules are aimed at providing quick and efficient assistance in conflict situations.

Contact:
rzecznikdoktorantow@ifj.edu.pl
The rules for resolving conflict situations:
https://kisd.ifj.edu.pl/rozwiazywanie-problemow/

POPULARIZATION

YOUNG SCIENTIST'S TENT

From July 17 to August 4, 2023, IFJ PAN held a series of workshops dedicated to children aged 6-15. 15 various workshops divided into 2 age groups were organized, making it in total 30 events.
The workshops were aimed at introducing its participants to basic physics. Each participant could take on the role of a young scientist and make a model of a simple physical device or conduct a physical experiment.

Participation in the classes was free of charge.

The total number of registered participants together with tutors amounted to **1502 people**.

The workshops were held by dr Dominika Kuźma, dr hab. Agnieszka Kulińska, dr hab. Piotr M. Zieliński, dr Izabela Babiarz, dr Anna Mrozik, dr Dominik Grządziel.

More information www.ifj.edu.pl/nmn/

The project was co-funded from the state budget within the program of the Ministry of Education and Science under the name of "Social responsibility of science", project no. SONP/SP/550683/2022, amount of funding PLN 211,490.00, total value of the project PLN 235,227.00.

THE MALOPOLSKA RESEARCHERS' NIGHT

On September 29, 2023, another edition of the Malopolska Researchers' Night took place on the premises of IFJ PAN. The event enjoyed great interest – the Institute was visited by over 1500 guests and around 100 employees.

The attendees familiarized themselves with the specificity of research carried out at IFJ PAN – they took part in experiments, visited laboratories, and also participated in various shows, contests, discussions, games and quizzes. The program of the event was adapted to different age groups, and the way the Night was organized was rated by the survey's participators as high or very high.

Małopolska
Noc Naukowców

The program included:

- "Tricks of Physics" experiment shows,
- Lectures "He stopped the Sun and moved the Earth – or a few words about Nicolaus Copernicus", "SMR reactors and the Polish Nuclear Power Program (PPEJ)", "The Physics of fire",
- A talk about artificial intelligence (A perfect scientist),
- Meetings and discussions with scientists on the Physicists' Couch ("What do we need scientists for"),
- Meetings with scientists from the ALICE and LHC experiments ("Alice in Particleland"),
- Exhibition of old measurement devices, computer elements and photographs (the history of Cracow Cyclotrones),
- Presentations of achievements of IFJ PAN main departments in tents and meetings with scientists, the CREDO tent where the newest accomplishments in cosmic particle detection were presented,
- A possibility of overhearing satellites – listening to and registration of photos from meteorological satellites passing over IFJ PAN,
- Field game "Scientific scavenger hunt",
- The Room of Puzzles,
- Quiz – "Face physics!", Scientist's poker game,
- Workshops at which the participants could build models of physics instruments (Constructor's Cellar, Young Engineer's Workshops),
- Young Physicist's Cinema – short movies presenting interesting physics issues together with discussions,
- A presentation and a show on electric resistance (The mysteries of superconductors).

"SPACESHIP" COMPETITION

The task of the participants was to make an art work in the form of a spacecraft. The model could be prepared with the use of arbitrary materials and could take an arbitrary shape. The constructions did not have to be able to fly.
The contest lasted from September 27 to October 5, 2023.

LATEST PRESS RELEASES

QUANTUM PROTON BILLIARDS

The quantum nature of interactions between elementary particles allows drawing non-trivial conclusions even from processes as simple as elastic scattering. The ATLAS experiment at the LHC accelerator reports the measurement of fundamental properties of strong interactions between protons at ultra-high energies.

https://www.eurekalert.org/news-releases/995108

STRONGLY INTRIGUING DETAILS OF COLLISIONS AT EXTREME ENERGIES

The initial phases of the heavy-ion collisions occurring at the maximum energies available at the CERN Large Hadron Collider continue to remain an enigma of modern nuclear physics. New theoretical tools improved by physicists from the Institute of Nuclear Physics of the Polish Academy of Sciences in Cracow will help to unlock this mystery.

https://www.eurekalert.org/news-releases/1001535

IMPORTANT STEP TOWARDS A NOVEL METHOD FOR EARLY CANCER DIAGNOSIS

Changes in the mechanical properties of cells are among the earliest signs of development of a cancer. Until now, one of the major obstacles to the use of mechanics in cancer diagnosis has been the lack of a standardised measurement procedure that would guarantee reproducibility and reliability of results. Thanks to European scientific cooperation involving the Institute of Nuclear Physics of the Polish Academy of Sciences in Cracow, this obstacle has now been removed.

https://www.eurekalert.org/news-releases/1003807

SCIENTISTS DISCOVER THE HIGHEST ENERGY GAMMA RAYS EVER SEEN FROM A PULSAR

Scientists using the H.E.S.S. observatory in Namibia have detected the highest energy gamma rays ever recorded from a dead star called a pulsar. The energy of these gamma rays clocked in at 20 teraelectronvolts, or about ten trillion times the energy of visible light. This observation is hard to reconcile with the theory of the production of such pulsed gamma rays, as the international team reports in the journal Nature Astronomy.

https://press.ifj.edu.pl/news/2023/10/06/