JANUARY 2024 NO. 8

NEWSLETTER

The Henryk Niewodniczański Institute of Nuclear Physics
Polish Academy of Sciences

IN THIS EDITION (X 2023 - I 2024)

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!

Contact
email: doi@ifj.edu.pl

AWARDS AND DISTINCTIONS

IFJ PAN DIRECTOR'S AWARD FOR SCIENTIFIC AND ORGANIZATIONAL ACTIVITY

Edition 11th:

- **prof. dr hab. Krzysztof Kutak**
- **dr hab. Katarzyna Mazurek**
- **dr Ewa Pięta**
- **dr Natalia Osiecka-Drewniak**
- **dr Mohamad Sadegh Shaker**

YOUNG SCIENTISTS COMPETITION

Mgr Jagoda Drop received the third award in the Young Scientists Competition for the poster presentation entitled "Comparison of performance of professional and popular dose-rate meters — experiences of a calibration laboratory". The award was presented at the NUTECH 2023 (International Conference on Development and Applications of Nuclear Technologies) taking place in Kraków on September 20-22, 2023.

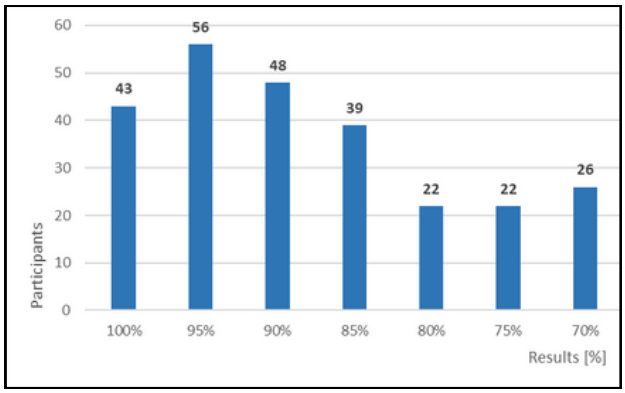
REVIEW OF ACTIVITY OCTOBER 2023 - JANUARY 2024

CHANGES TO INTERNAL REGULATIONS

- Update of rules of procedures for sale of scrap and non-ferrous metals
- Introduction of rules for management of waste produced at IFJ PAN and "Procedures for managing chemical waste at IFJ PAN"
- Changes to "Rules for managing copyright and related rights and industrial property law and rules for commercialization of research and development work results at IFJ PAN"
- Introduction of "Rules
- Introduction of "Rules for using research infrastructure at IFJ PAN"
- Introduction of changes to Work Regulations and Remuneration Policy of IFJ PAN Employees
- Change to the Organizational Regulations – the Department of Experimental Physics of Complex Systems (NZ52) is renamed to the Department of Biological Physics and Nanospectroscopy (NZ52)
- Introduction of Rules determining the procedure for conferring the status of "Professor Emeritus IFJ PAN"
- Update of regulations for publishing information in the BIP

TRAINING ON OPEN ACCESS FOR EMPLOYEES AND PHD STUDENTS

The training on open access to publications and research data took place on **October 4-25, 2023**. The training was based on a previously prepared guide "Open access to scientific publications and research data" containing the most important information about publishing open scientific papers, research data, guidelines from funding units, and recommendations for authors.
256 people participated in the training – 221 IFJ PAN employees and 35 KISD PhD students. Following the training, all participants took a test verifying their knowledge on open access. The test comprised 20 questions (some of them were multiple choice questions). Collecting 14 (70%) correct answers resulted in passing the test.
The results are presented in the bar graph below:



SURVEY ON THE PRODUCTION OF RESEARCH DATA AT IFJ PAN

In October 2023, IFJ PAN employees carrying out research activity and PhD students took part in a survey aiming to check the inventory of research data at IFJ PAN. The link to the survey was sent to 275 people, out of whom only 54 answered the questions (20%).

ELECTIONS TO THE IFJ PAN DISCPLINARY COMMITTEE

The first round of the elections to the IFJ PAN Disciplinary Committee took part on **October 30, 2023.** There were 2 candidates running for the position of the Chairperson of the Disciplinary Committee and 9 candidates running for the positions of members of the Committee.
115 out of 220 people entitled to vote took part in the elections, which were secret and direct. This constituted 52% of all employees with active voting rights.
In the first round of the elections, the Chairperson and 3 members of the Disciplinary Committee were selected as follows:

- **prof. Jerzy Mietelski** – Chairperson of the Disciplinary Committee (92 votes),
- **dr Arkadiusz Zarzycki** – member (24 votes),
- **dr hab. Agnieszka Kulińska** – member (23 votes),
- **dr hab. Andrzej Bożek** - member (20 votes).

In connection with the fact that two candidates applying for the position of the fourth member of the Committee, that is dr Agnieszka Panek and dr inż. Marzena Rydygier, received the same number of votes, the second round of the elections had to be organized, which took place on **November 13, 2023**.
105 voters took part in the second round, which constituted 48% of all employees entitled to vote. The majority of the votes were cast on **dr Agnieszka Panek** and she was selected as the fourth member of the committee.
More information about the Disciplinary Committee can be found at: www.ifj.edu.pl/dla-pracownikow/komisje/komisja-dyscyplinarna/

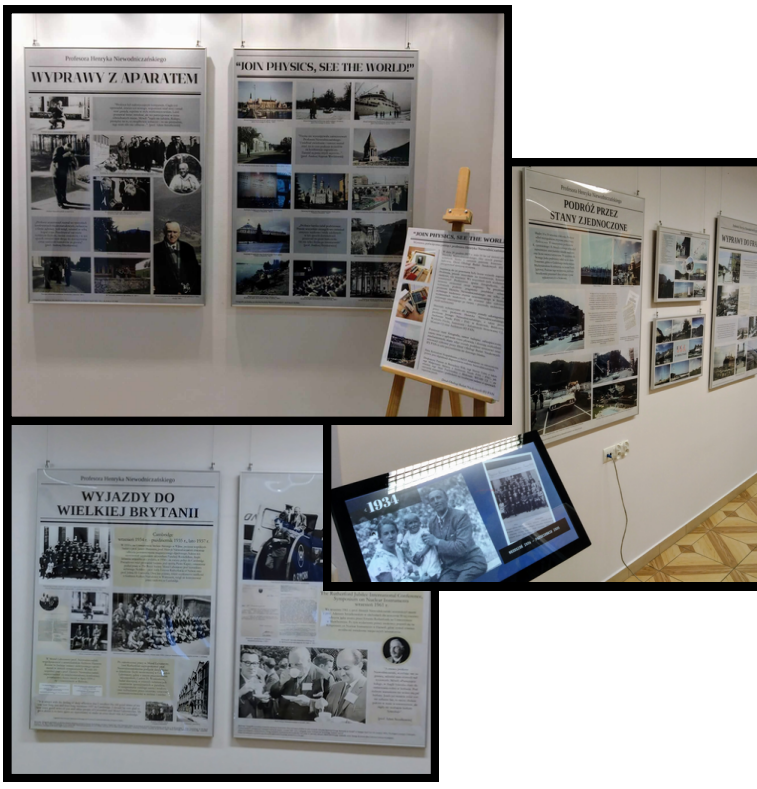
ELECTIONS TO THE IFJ PAN SCIENTIFIC COUNCIL

The elections to the IFJ PAN Scientific Council for the term 2024-2027 took place **on December 4, 2023**. The voters could select 30 out of 73 candidates running for Group A and 2 out of 4 candidates running for Group B. The voter turnout in Group A and Group B amounted to 84,76% and 51,22%, respectively.
After counting all the votes, the Elections Committee unanimously stated that all the available seats were taken in both groups in the first ballot.
Information about the election along with the list of persons elected to the Scientific Council of the IFJ PAN for the term 2024-2027 is available at the following link: www.ifj.edu.pl/instytut/rada-naukowa/wybory/

EXHIBITION COMMEMORATING PROFESSOR HENRYK NIEWODNICZAŃSKI

On December 20, 2023, fifty-five years had passed since the death of Professor Henryk Niewodniczański, Founder and Patron of our Institute. The anniversary of his death was commemorated by Prof. Tadeusz Lesiak, Director of IFJ PAN, and Prof. Bogdan Fornal, Scientific Director, who laid flowers at the grave of the late Professor at the Rakowicki Cemetery.

In order to commemorate this outstanding physicist and, the Research Service and Administration Department organized an exhibition that can be viewed in the IFJ PAN Library. The inspiration to prepare this event came from slides made available by Prof. Jerzy Niewodniczański. They contained photos taken by Prof. Henryk Niewodniczański during his numerous trips abroad for scientific conferences and consultations. The Professor was not only a remarkable scholar, but also a man enraptured by the world, the culture of the countries he visited, their architecture, landscape. The photographs he took give evidence to this admiration.
The exhibition features posters presenting restored photographs taken by the Professor during his scientific trips, accompanied with descriptions, and two short movies: “Join physics, see the world” and “Berlin expeditions” shown in multimedia kiosks.



OPEN SESSION OF THE IFJ PAN SCIENTIFIC COUNCIL

On **December 21, 2023**, an open session of the IFJ PAN Scientific Council featured the ceremony of habilitation and doctoral promotions.

HABILITATION PROMOTIONS

1. **Dr hab. Mariola Kłusek-Gawenda**
2. **Dr hab. Tomasz Wąchała**
3. **Dr hab. Bartłomiej Zapotoczny**
4. **Dr hab. Piotr Lebiedowicz**
5. **Dr hab. Rafał Maciuła**
6. **Dr hab. Wojciech Gieszczyk**

DOKTORAL

1. **Dr Andrzej Buda**
2. **Dr inż. Miłosz Zdybał**
3. **Dr Agnieszka Wochnik**
4. **Dr Kajangi Gnanachandran**
5. **Dr inż. Joanna Hałun**
6. **Dr inż. Karolina Stelmach**
7. **Dr Andrii Fedorchuk**
8. **Dr inż. Agata Toboła-Galus**
9. **Dr inż. Małgorzata Sankowska**
10. **Dr Tomoki Goda**
11. **Dr inż. Maciej Dudek**
12. **Dr Sneha Bhosale**
13. **Dr Himanshu Sharma**
14. **Dr inż. Sebastian Bysiak**
15. **Dr Karishma Dhanmeher**

INAUGURAL SESSION OF THE IFJ PAN SCIENTIFIC COUNCIL FOR THE TERM 2024-2027

The first session of the members of the IFJ PAN Scientific Council for the term 2024-2027 took place on **January 15, 2024**. At the session, **prof. Antoni Szczurek** was chosen as the Chairperson of the Council.
The members of the Council also nominated their representatives to the Competition Commission for the selection of the Director of IFJ PAN - **dr hab. Anna Kaczmarska, IFJ PAN professor** and **prof. Paweł Olko**.

The full composition of the Scientific Council of IFJ PAN is available at:
www.ifj.edu.pl/instytut/rada-naukowa/sklad-osobowy/

HUMAN RESOURCES STRATEGY FOR RESEARCHERS

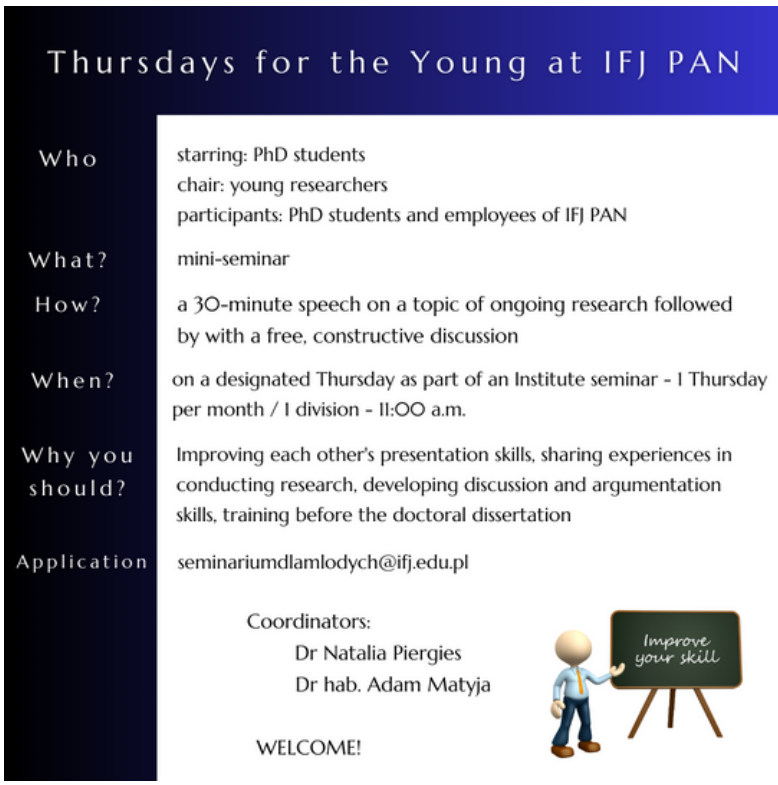
On the IFJ PAN website, the following information materials on the implementation of the Human Resources Strategy for Researchers have been published:

- information leaflet,
- report on the activities from July to December 2023,
- information on all actions implemented so far.

HR EXCELLENCE IN RESEARCH

SEMINARS FOR YOUNG SCIENTISTS

Since November 2023, as part of the implementation of the HRS4R strategy, a series of seminars dedicated to young PhD students and employees with the purpose of mastering the art of self-presentation has been organized at IFJ PAN.
Details can be found in the poster below:



PROTON THERAPY

On **December 14, 2023, the Maria Sklodowska-Curie National Research Institute of Oncology in Krakow** and the Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences signed a contract for 2024 extending the cooperation on proton therapy of tumors localized outside of the sight organ in adult and pediatric patients.
From 2016 until the end of 2023, over **1060 irradiations of oncologic patients** with tumors localized outside of the sight organ had been carried out in the gantry facilities.

The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences signed a contract with **the Independent Public Healthcare Center of the University Hospital in Krakow** on conducting proton therapy of eye ball tumors.
Irradiations of uveal melanoma have been carried out at the Institute since 2011. By the end of 2023, over **350 oncologic patients** had undergone this treatment.

SCIENTIFIC COLLABORATION

COLLABORATION WITH LABORATOIRE DE PHYSIQUE DES 2 INFINIS IRÈNE JOLIOT-CURIE

The second workshop dedicated to the collaboration of IFJ PAN and Laboratoire de Physique des 2 Infinis Irène Joliot-Curie (IJCLab) took place on **7 and 8 December 2023** in Orsay, France.
The meeting was devoted to cooperation for the implementation of proposals of joint projects submitted by the employees of the Institute and the Laboratory in Orsay and was organized with the participation of representatives of the authorities of IFJ PAN, its Scientific Divisions, Cyclotron Centre Bronowice, Division of Scientific Equipment and Infrastructure Construction, and the Director of the Kraków School of Interdisciplinary PhD Studies. Following the presentations of these so-called pre-projects, Prof. Tadeusz Lesiak, IFJ PAN Director, and Prof. Achille Stocchi, IJCLab Director, signed a cooperation agreement for the implementation of research topics selected by the collaboration board. On the second day of the workshop, IFJ PAN employees had the opportunity to visit the Laboratory (ALTO) and held discussions about the execution of joint undertakings.

CONFERENCES AND EVENTS

NATIONAL CONFERENCE ON NON-DESTRUCTIVE TESTING

The 50th Jubilee National Conference on Non-destructive Testing, organized by the Polish Society for Non-destructive Testing and Technical Diagnostics SIMP, took place on **October 17-19 2023** in Kołobrzeg.
The goal of the conference was exchange of experience, sharing knowledge and promotion of new ideas by scientists from different research centers and, most importantly, by researchers from Polish and foreign laboratories dealing with broadly-understood non-destructive research. The important aspects discussed at the conference were related to staff training, accreditation of non-destructive testing laboratories, and new rules and regulations on non-destructive testing.
At the conference, dr inż. Izabela Milcewicz-Mika and prof. dr hab. Maciej Budzanowski, employees of the Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences, discussed the problem of radiological protection of workers employed in industry, particularly those dealing with non-destructive testing, and issues related to neutron dosimetry. The scientific sessions of the conference were accompanied by an exhibition introducing the newest solutions in the scope of non-destructive testing. At the exhibition, the Laboratory of Individual and Environmental Dosimetry of IFJ PAN presented its measurement capabilities in the range of individual and environmental doses of ionizing radiation.

THE 25TH MEETING OF THE COOPERATION COUNCIL MEMBERS WITHIN THE TIARA PROJECT

On **November 6-7, 2023**, the Institute of Nuclear Physics PAN hosted the 25th session of the Cooperation Council members within the TIARA project. The meeting was headed by dr hab. Dariusz Bocian, IFJ PAN Scientific and Technical Director, and was attended by representatives of CERN, Uppsala University, National Institute of Nuclear and Particle Physics, University of Oxford, Paul Scherrer Institut, European Spallation Source, INFN-Laboratori Nazionali di Frascati, Kyma S.p.A., UK Research and Innovation (STFC-UKRI), Centro de Investigaciones Energeticas Medioambientales y Tecnologicas (CIEMAT), GSI Helmholtzzentrum für Schwerionenforschung GmbH. The meeting was also attended by prof. Piotr Malecki, a long-standing representative of IFJ PAN in the TIARA Council.
TIARA is a consortium of European research centers operating significant R&D Infrastructures in the European Particle Accelerator Research Area. The main goal of the consortium is to create a dedicated structure to exchange experties and to facilitate and support the setting-up of joint R&D programmes and education and training in the field of Accelerator Science and Technology in Europe.

During the meeting, the participants discussed activities taken up within the on-going European projects (I.FAST – report on the workshop: Superconductivity for Sustainable Energy Systems and Particle Accelerators, ISAS – updated information on a newly launched project in the field of accelerator technologies) and projects in preparation for the incoming calls for applications “HFM – High Field Magnets” and “Multi-physics Modelling, Machine learning and Model-based Control in AS&T”.
Information on actions taken up in the area of Education and Training, Medical Accelerator Applications, and cooperation with industry partners – Accelerator Industry Permanent Board report, was also presented.

LECTURE DELIVERED BY PROFESSOR PAUL JANMEY

On **November 15-16, 2023**, the Department of Experimental Physics of Complex Systems had a pleasure to host Professor Paul Janmey (Institute for

Medicine and Engineering, University of Pennsylvania), a world-renowned expert in biophysics and mechanobiology. Professor Janmey delivered a lectured entitled "Magnetoelastic and electrically conductive soft substrates for cell culture" at the IFJ PAN seminar, visited laboratories and got acquainted with research topics pursued at the Division of Interdisciplinary Research.

RED HOT FLUORINE 19F MRI & SMALL ANIMAL MRI SYMPOSIUMS MEET KRAKÓW MRI WORKSHOP

On December 4-6, 2023, IFJ PAN held the conference "Red Hot Fluorine 19F MRI & Small Animal MRI Symposiums meet Kraków, MRI Workshop", organized by the Department of Magnetic Resonance Imaging headed by dr hab. Władysław Węglarz, IFJ PAN professor.

The conference was devoted to the newest accomplishments in terms of progress and applications of magnetic resonance imaging (MRI) and other methods of biomedical imaging (MPI, CT) in the scope of development works, pre-clinical studies and innovative medical and pharmaceutical applications. The core theme of the conference was 19F magnetic resonance imaging as a promising method for better tracking of metabolic processes and for improving the diagnosis of pathological conditions in an organism. The scope of the presentations included the processes of preparation and determination of physicochemical properties of 19F probes, as well as examples of their applications in pre-clinical studies. Other problems discussed at the meeting included, among others, the newest achievements in studies of the structure and functions of small living organisms and improvement of patients' diagnosis by using localized MR spectroscopy or MRI methods combined with AI.

The goal of the conference was to strengthen the international and national cooperation between representatives of different fields of science interested in development of biomedical imaging techniques and their applications in research, particularly in the scope of using imaging and 19F spectroscopy in pre-clinical studies.

The scientific sessions were devoted to the presentation and discussion of the newest global accomplishments in this discipline.

Over 70 participants took part in the conference, including 40 representatives from abroad: Germany, Czech Republic, Austria, Italy, Spain, Switzerland, the Netherlands, Norway, Canada and the USA.

35 on-site and 2 on-line lectures were delivered, of which 10 were given by PhD students. The research topics pursued at the Department of Magnetic Resonance Imaging were presented in the form of 2 lectures delivered by an NZ56 employee and a PhD student and in 3 speeches given by collaborators from other scientific institutions. Over 20 posters were presented, of which 4 – by representatives of the Department, and additional 4 – by representatives of other groups taking advantage of NZ56 research infrastructure.

Detailed information, along with the book of abstracts, is available on the conference website:
Red Hot Fluorine 19F MRI & SAMS meet Kraków MRI Workshop 2023 (4-6 December 2023).

DESIGN REVIEW MEETING OF EUROFUSION PROJECT

The 2023 Design Review Meeting organized within the EUROFusion project ENR-TEC.01.IPPLM-T002-D00 under the name of "Development of GEM detector as a compact neutron spectrometer for fusion plasmas (NS_GEM)" took place on **December 6, 2023.**

The event was organized by the Department of Radiation Transport Physics (NZ61) at IFJ PAN. The meeting gathered 12 participants, including two persons from AGH, and representatives of EUROfusion and CEA Cadarache, France. The event was devoted to main achievements and the current status of works on the project of a neutron spectrometer based on GEM (Gas Electron Multiplier) detector for the needs of thermonuclear fusion. The goal of this four-year project is to develop a method of spectrometric measurement of neutrons through the detection of a charged particle created as a result of neutron conversion on a thin polyethylene film. The project is carried out in cooperation of IFJ PAN with the Faculty of Physics and Applied Computer Science AGH in Cracow and CEA Cadarache and is funded by the European consortium EUROfusion and the Polish Ministry of Education and Science as a co-funded international project.

WORKING MEETING DEVOTED TO THE CONSTRUCTION OF A NEW FOCAL CALORIMETER FOR THE ALICE EXPERIMENT

The working meeting devoted to the construction of a new FoCal calorimeter for the ALICE experiment took place on **January 9-10,2024**.

The detector will start its operation in 2029 during Run 4 at the LHC. The total cost of the detector without labor costs is estimated at 12 MCHF.
The meeting gathered 25 representatives from leading scientific institutions: Oak Ridge National Laboratory (the USA), Niels Bohr Institute (Denmark), Tsukuba University (Japan), Utrecht University (the Netherlands) and Bergen University (Norway).
FoCal will measure forward photons, electrons and hadrons at large rapidities. The goal of these studies is to, among others, investigate an intriguing phenomenon of gluon saturation, which can have a fundamental impact on the production of particles in nuclear collisions.
A group of engineers (DAI) and physicists (NZ23) from IFJ PAN will be responsible for the mechanical construction and cooling of the detector. The assembly and preliminary tests will be conducted at DAI. Moreover, radiation testing of the reading electronics will be carried out with the use of the CCB cyclotrons.
The project is carried out with the support of the Ministry of Education and Science (Support for Participation of Polish Scientific Teams in International Research Infrastructure Projects, grant no. DIR-WSIB.92.11.2023). Project leaders at IFJ PAN: dr hab. Jacek Otwinowski and Jacek Świerblewski.

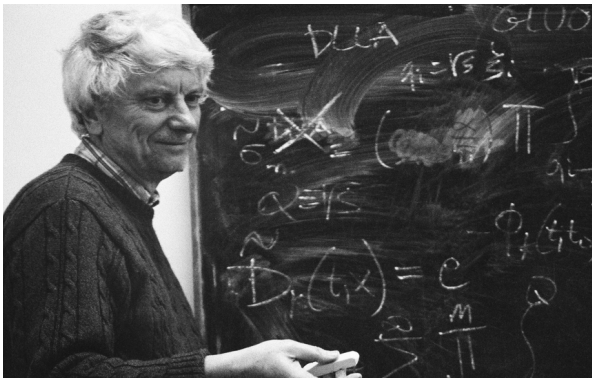
XXX CRACOW EPIPHANY CONFERENCE ON PRECISION AT HIGH ENERGY COLLIDERS

The 30th edition of the Epiphany Conference was held at IFJ PAN in Kraków on January 8-12, 2024. This year's conference was organized under the title of "on precision physics at high energy colliders" and was devoted to the commemoration of Prof. Stanisław Jadach, who passed away on February 26, 2023.
76 participants took part in the conference, at which 66 lectures presenting the newest theoretical and experimental results in the field of particle physics were delivered. The program of the conference included the following thematic sessions: Quantum chromodynamics and Monte Carlo generators, Standard Model, heavy flavors, Higgs boson physics, future colliders, heavy ions, physics beyond the Standard Model.
Traditionally, as part of the conference, a session for young scientists was organized, at which PhD students and young postdoctoral researchers had a chance to, often for the very first time, present the results of their studies. 17 lectures were given at the young scientists' session.

The conference featured a special session dedicated to Prof. Stanisław Jadach. The lectures at the session were delivered by renowned experts well-versed in academic achievements of Professor Jadach, among others by Rolf-Dieter Heuer (CERN director in 2009-2015), Patrick Janot, Alain Blondel, and Prof. Jadach's collaborators of long standing: Zbigniew Wąs and Bennie Ward.

Professor Stanisław Jadach

An employee of the Institute of Nuclear Physics PAN from 1992. For many years he headed the Division of Theoretical Physics. A long-term member of the IFJ PAN Scientific Council. A member of the Polish Academy of Arts and Sciences.
He scientific interests focused on theoretical particle physics. He was the author of the method of precise solving of quantum electrodynamics equations with the use of stochastic simulations – an innovation on a global scale.
He founded the famous Cracow School of Theoretical Physics that uses this method to study fundamental interactions at large energies. His scientific output became the foundation for a theoretical description of electron-positron collisions in the largest elementary particle colliders: LEP1 and LEP2 at CERN. His computer programs were used by all experimental groups as the main tool for analyzing data from LEP1 and LEP2.
In the last years of his life Prof. Jadach was involved in the FCCee project, and it was for the needs of this project that he successively developed his calculations and software.



BIG SCIENCE PARTNER & INDUSTRY DAY

On **January 12, 2024**, the Institute of Nuclear Physics Polish Academy of Sciences hosted more than 100 Polish industrialists at the event Big Science Partner & Industry Day held in order to establish relations between science and industry. The meeting, organized jointly by the Institute of Nuclear Physics Polish Academy of Sciences and the National Centre for Nuclear Research, was inaugurated by Directors prof. dr hab. Tadeusz Lesiak and prof. dr hab. Krzysztof Kurek, who presented their Institutes.

The participants could learn about rules and prospects of cooperation with biggest scientific infrastructures in Europe, discussed by employees directly involved in processes of execution of contracts and implementation of research and R&D projects: Joshua Davison (CERN), Daval Mehdi (F4E, ITER), Antonio Bonucci (E-XFEL) and Aleś Hala (ELI ERIC).
The Polish industrialists had also a chance of learning about good practices of cooperation with these research centers from Artur Zeh (FORMAT), Marcin Orzechowski (BIMO) and Sylwester Chojnowski (CREOTECH), who shared their experience.
The event ended with a series of over forty individual B2S meetings of Polish entrepreneurs with representatives of the presented infrastructures and international organizations, which initiated talks about future collaboration.

An incoming event under the name of Big Science Business Forum 2024 (BSBF 2024) was also announced at the meeting. BSBF 2024, the third event continuing the previous successful editions organized in Copenhagen (2018) and Granada (2022), will this time take place in Trieste, Italy in October 2024.

“A large interest expressed in this event has become an incentive for us to organize another meeting for Polish entrepreneurs, perhaps as soon as in autumn this year” – commented dr hab. Dariusz Bocian, IFJ PAN Scientific & Technical Director and organizer of the meeting.

PHD STUDIES

NAWA STER PROGRAM – INTERNATIONALIZATION OF PHD SCHOOLS, EDITION 2020

December 2023 marked the completion of a three-year project entitled: "Kraków Interdisciplinary Doctoral School for Internationalization, Interdisciplinarity and Innovation-KISD4iii" funded from the program of the Polish National Agency for Academic Exchange NAWA: STER – internationalization of PhD Schools.
Materials promoting the Krakow School of Interdisciplinary PhD Studies, created as part of the project, can be downloaded in a PDF format from the KISD webpage. Some of the printed materials are also available at the KISD office.
Two KISD PhD students: mgr Anna Nykiel (IFJ PAN) and mgr Gabriela Oleksy (IKiFP PAN - Jerzy Haber Institute of Catalysis and Surface Chemistry of the Polish Academy of Sciences) were awarded scholarships for the best KISD students implementing doctoral projects in an international collaboration. Both PhD students delivered lectures at the ceremonial inauguration of the academic year 2023/2024.
The project financed 58 internships of KISD PhD students (out of which 31 took place in 2023). Their total cost was PLN 1,216,00.00. The internships lasted from 1 to 3 months and included such countries as, among others, Austria, Sweden, Denmark, France, Germany, Great Britain, Spain, Portugal, Italy, the USA.
The students of the PhD School had the possibility to listen to guest lectures delivered by foreign lecturers from the Macedonian Academy of Sciences and Arts (Macedonia), Université Laval, Québec (Canada), University of Central Florida (USA), KTH Royal Institute of Technology (Sweden).
The students could also participate in trainings on soft skills, covering such topics as planning your own career path, supervising research teams, coping with stress, or cybersecurity. The trainings were organized mostly in small groups, giving the possibility of group work and integration. 54 PhD students took part in a training on cybersecurity.
The KISD4iii project made it possible for the PhD School students preparing doctoral dissertations in the discipline of materials engineering to take part in the international seminar European School for Young Materials Scientists. In 2021 nine PhD students took part in a meeting in Dresden (Germany), in 2022 seventeen PhD students joined a meeting in Lisbon (Portugal), and in 2023 fourteen KISD students participated in a seminar in Brno (Czech Republic).
As part of the project, the templates of documents used to establish international cooperation in the field of doctoral education were developed, such as: Letter of Intent, Memorandum of Understanding, Double Degree Agreement, Agreement of Joint Supervision. The document templates are available at the PhD School's office for all employees of the units co-forming KISD.

NAWA STER PROGRAM – INTERNATIONALIZATION OF PHD SCHOOLS, EDITION 2023

IFJ PAN became a beneficiary of the NAWA STER program – internationalization of PhD Schools, 2023 edition. The project "Krakow School of Interdisciplinary PhD Studies – beyond the horizon through cooperation, internationalization and interdisciplinarity, KISD4All" has obtained funding in the amount of PLN 2,000,000.00 and will cover the period of 3 years from January 1, 2024 to December 31, 2026.

"OPEN TO THE WORLD" AWARD

IFJ PAN together with the Krakow School of Interdisciplinary PhD Studies became the winner of the first place in the category: "Open to the world" in the competition of the ProDok 2023 Doctoral Community organized by the Polish Association of Doctoral Candidates. The jury assessed the scope of mobility support and internationalization offered by an entity running a PhD School. The ceremonial awards gala took place on Saturday, November 18, 2023. IFJ PAN was represented by mgr Aleksandra Pacanowska, chair of the PhD Self-Government Board at IFJ PAN.

KISD DEPUTY DIRECTOR AT IFJ PAN

Since January 1, 2024, **dr hab. Mirosław Gałązka** has been acting as Deputy Director of the Krakow School of Interdisciplinary PhD Studies.

POPULARIZATION

VISIT OF JASŁO CHILDREN'S UNIVERSITY STUDENTS AT IFJ PAN

On November 18, 2023, IFJ PAN hosted students of Jasło Children's University. The visit started with a popular science show, i.e. from fascinating experiments of physics where nature reveals its true and surprising colors. During the classes the participants had an opportunity to see experiments improving their understanding of the surrounding world. The children could learn what angular momentum, pressure and frictional force are, why a plane rises into the air, and they also had a chance to see a levitating superconductor.
Next, all the guests took part in colorful workshops, at which they could build models of physical devices with their own hands. The models could be taken home by their creators.
Hosts: dr Dominika Kuźma and PhD student Anna Nykiel.
The popular science show and the workshops gathered 120 participants in total - children and their guardians.

CONTEST "ENCHANTED BY PHYSICS" SECOND EDITION

The second edition of the contest **"Enchanted by physics"** started on December 20, 2023. The participants of the competition take on the role of scientists. Their task is to create a short, 7-minute maximum movie presenting an interesting physical problem and discuss it.
The competition is carried out in five age categories.
The deadline for submitting the movies: **January 26, 2024.**
The results of the contest will be announced at a special live session on February 19, 2024 – Polish Science Day with IFJ PAN.

The competition is carried out as part of the project "Physics as the key to understanding the world second edition", co-financed from the state budget funds within the framework of the program of the Ministry of Education and Science under the name of "Social responsibility of science", project no. SONP/SP/550514/2022, grant amount PLN 169 336.00, total value of the project PLN 188 340.00.

LATEST PRESS RELEASES

X-RAY LASERS: WHY DOES BRIGHTER MEAN DARKER?

When we illuminate something, we usually expect that the brighter the source we use, the brighter the resulting image will be. This rule also works for ultra-short pulses of laser light – but only up to a certain intensity. The answer to the question why an X-ray diffraction image 'darkens' at very high X-ray intensities does not only deepen fundamental understanding of the light-matter interaction, but also offers a unique perspective for the production of laser pulses that have significantly shorter pulse duration than those currently available.

www.eurekalert.org/news-releases/995108

CHEAP AND EFFICIENT ETHANOL CATALYST FROM LASER-MELTED NANOPARTICLES

Ethanol fuel cells are regarded as promising sources of green electricity. However, expensive platinum catalysts are used in their production. Research on laser melting of suspensions, carried out at the Institute of Nuclear Physics of the Polish Academy of Sciences in Cracow, has led researchers to materials that catalyse ethanol with a similar – and potentially even greater – efficiency to platinum, yet are made of an element that is many times cheaper than platinum.

www.eurekalert.org/news-releases/1001535

LHCB: CORRELATIONS SHOW NUANCES OF THE PARTICLE BIRTH PROCESS

High-energy ion collisions at the Large Hadron Collider are capable of producing a quark-gluon plasma. But are heavy atomic nuclei really necessary for its formation? And above all: how are secondary particles later born from this plasma? Further clues in the search for answers to these questions are provided by the latest analysis of collisions between protons and protons or ions, observed in the LHCb experiment.

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SUMMARY OF DEPARTMENTAL ACTIVITIES AT IFJ PAN IN 2023

PUBLIC PROCUREMENT

Public Procurement Department

In 2023, the Public Procurement Department conducted **54** public procurement procedures and supported 13 proceedings in the procedure carried out based on Rules for awarding contracts in the field of science, in the range of culture, and contracts for social services.
Public procurement contracts with the division due to the type of a contract:

- building works - 7 procedures - contract amount: **PLN 336,800.15**,
- supplies - 28 procedures - total contract amount: **PLN 10,919,421.71**,
- services - 19 procedures - total contract amount: **PLN 2,505,518,69**.

Contracts in the field of science, in the range of culture, and for social services:

- contracts in the field of science - 2 procedures - total contract amount: **PLN 204,966.07**,
- contracts for social services - 11 procedures - total contract amount: **PLN 485,919.56**.

Through the agency of the Public Procurement Department, the amount spent in total: **PLN 14,452,626.18.**
In 2023, the Public Procurement Department provided over 800 pieces of advice pertaining to spending public funds.

Supplies Department

The number of order requests registered by the Supplies Department in 2023: **3 428**.
The number of public procurement procedures for supplies, services and works of the estimated value below the threshold of the Public Procurement Law and above PLN 10,000 net: **128**, including:

- 78 procedures for supplies of a total value of **PLN 2,774,326.02**,
- 46 procedures for services - **PLN 1,623,025.10**,
- 4 procedures for works - **PLN 94,710.00**.

The total value of the procedures: **PLN 4,492,061.12.**

SALE
5 procedures for sale and rental of space were carried out.

INVENTORY
The Supplies Department carried out 9 inventories:
- 5 delivery-acceptance inventories,
- 1 random inventory,
- 3 periodic inventories.

INTERNATIONAL COMMERCIAL EXCHANGE
The main partners of IFJ PAN in international trade in terms of the value of imports of goods and services in 2023: Germany, Sweden, Czech Republic, Great Britain.
In 2023, the Supplies Department performed 38 customs clearances in the procedure of marketing authorization, 1 customs clearance in the procedure of outward processing, and 13 customs clearances in import procedure.

RENOVATIONS

Technical Section

In 2023, the Technical Section carried out a series of modernizations, renovations and adaptations of rooms at IFJ PAN, including:

- adaptation of communication routes in order to facilitate access to buildings situated on the premises of IFJ PAN for disabled people. Two freight and passenger lifts in buildings 0 and 1, a lift in building 4 and platforms for transporting disabled people in building 1 and 4 were put into service;
- modernization of lightning installation and replacement of light sources with LED in common areas (communication routes, toilets);
- preparation of back offices for popular science events organized in the open air (Young Scientist's Tent, Małopolska Researchers' Night), including the assembly of makeshift roofed constructions (tents) with dimensions of 12m x 8m and 8m x 4m together with the floor and essential installations;
- refurbishment of library rooms and assembly of elements for an exposition dedicated to Prof. Henryk Niewodniczański;
- Department of Nuclear Physical Chemistry (NZ64): laboratory in building no. 6 – general renovation of laboratories, offices and social rooms with a total area of ~120m2. The renovation encompassed buildings and installation works (plumbing system, central heating, ventilation, air-conditioning, electricity, IT).

- Department of Soft Matter Research (NZ35): laboratory in building no. 26 – adaptation of the building's space for the needs of the laboratory in terms of building and installation works (plumbing system, ventilation, electricity);
- Department of Nuclear Physical Chemistry (NZ64): three laboratories in building no. 18. Adaptation of the rooms in terms of building and installation works (electricity, air-conditioning). Fulfilment of additional requirements (replacement of woodwork and installation of external shutters);
- Department of Nuclear Physical Chemistry (NZ64): modernization of the ventilation systems of the air closets in the physicochemical laboratory in building no. 1;
- Renovation of the condensing unit hall - building no. 18: adaptation of rooms for IFJ PAN needs;
- Construction of sets of furniture for the needs of social rooms, offices and laboratories for 14 Units/Departments;
- renovations of rooms for the needs of: Department of Radiation Transport Physics (building 1, Department of Molecular Magnetism (building 18);
- adaptations of rooms for the needs of: Department of Molecular Magnetism (building 26), Division of Scientific Equipment and Infrastructure Construction (building 26), Department of Magnetic Resonance Imaging (building 18), Department of Soft Matter Research (building 18).

HEALTH PROTECTION AND OCCUPATIONAL SAFETY

In 2023, **Health and Safety Inspector/Health Protection and Occupational Safety Department** completed the following tasks:

- preparation of "Health Protection and Occupational Safety status analysis" for 2022;
- performing Occupational Risk Assessment for worksites in the Department of Magnetic Resonance Imaging (NZ56) and the Laboratory of Radiometric Expertise (NLR);
- organization and coordination of studies / measurements of work environmental factors to determine the intensity of electromagnetic fields around the device: magnetic resonance instrument – tomograph Bruker BioSpec 94/20 USR 9,4 T; noise at the positions of: carpenter, locksmith, plumber, bricklayer, plasterer, house painter (DOT), maintenance worker (DOG); vibrations with a general impact on the human organism (DOG); vibrations having an impact on the human organism through upper limbs (DOG); wood dust at the position of carpenter (DOT);
- performing or coordinating Health Protection and Occupational Safety trainings: initial for employees, PhD students, trainees and interns; periodic for individual work groups; specialist in the scope of electrical qualifications, occupational safety and health in the work with cytostatics, first aid;
- control of work conditions and compliance with the occupational safety and health rules and principles;
- giving opinions on modernized or newly created workplaces with regard to occupational safety and health;
- chairing the inventory committee on chemical and mutagenic substances used at IFJ PAN;
- preparation of documentation related to the management of chemical waste: "Chemical Waste Management Procedure at IFJ PAN", "Occupational safety and health instructions for the general warehouse of chemical substances"; the document "Malopolska Researchers' Night safety plan".
- developing "System of general safety during the distribution of cryogenic liquids on the premises of IFJ PAN".

In 2023, the Radiation Protection Department, completed the following tasks, among others:

- organizing and conducting 2 trainings (April and September) that constitute a condition for admission to the certification examination for a position of significance importance to nuclear safety and radiological protection;
- preparation of applications and coordination of conferral of powers by the President of the National Atomic Energy Agency; preparation of applications to the Central Register of Doses (for 30 employees and 19 trainees); preparation of applications for Radiation Passports ;
- preparation of certificates and dosimeters for participants of scientific experiments at IFJ PAN from foreign research centers;
- providing supervision over the compliance with the radiological protection requirements in connection with conducting activities with the use of ionizing radiation sources at IFJ PAN (registries, audits, training, documentation development, conducting dosimetry measurements, nuclear material inventories, register of doses for 255 employees together with PhD students and a register of environmental doses for 187 measurement pointsdose);

- conducting initial/periodic trainings on radiological protection and initial/periodic drills related to the Company Emergency Action Plan for: 33 employees together with PhD students and 19 trainees/interns; conducting trainings for the IFJ PAN emergency team; conducting on-the-job trainings on radiological protection and on rules for traffic on the premises of Cyclotron Centre Bronowice for employees of health care units taking part in proton radiotherapy (6 persons); conducting 2 trainings for CCB employees on "The categories and criteria for the qualification of unintended and accidental radiation exposures";
- developing "The system of physical protection of nuclear materials category III at IFJ PAN";
- preparation of and keeping documentation on exposure assessment for the employees and the general population for 2022;
- in cooperation with the Health and Safety Inspector, preparation of information about carcinogenic or mutagenic factors for 2022 in connection with work conducted in conditions exposing to a mutagenic factor, i.e. ionizing radiation;
- coordination of works connected with the maintenance of the Theratron 780E Cobalt Machine security system: SAMAX system.

MEASUREMENTS OF RADON CONCENTRATION

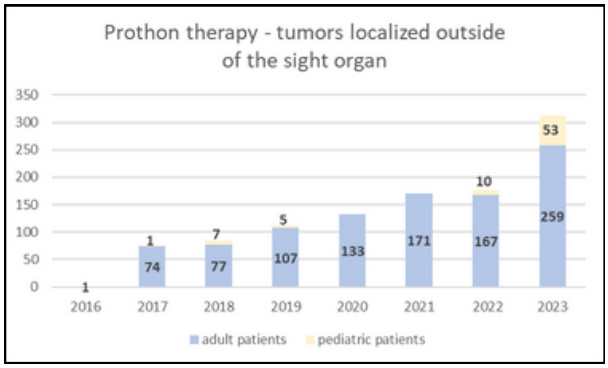
Poland's Nuclear Law, revised a few years ago, introduced a provision obliging an employee to measure an average annual activity concentration of radon in workplaces. The reference level was determined to be 300 Bq/m3 and should not be exceeded. In 2023, the Laboratory of Radiometric Expertise of IFJ PAN (LER) carried out large-scale measurements of radon concentration in workplaces using CR-39 track detectors. Over 320 measurements were completed mainly in the area of Lesser Poland Voivodeship, Lower Silesian Voivodeship, Świętokrzyskie Voivodeship and Subcarpathian Voivodeship. Since 2010, the Laboratory has been a holder of an accreditation issued by the Polish Centre for Accreditation to use this scientific method. In cooperation with BHP, measurements of radon concentration in selected rooms of IFJ PAN are scheduled to be performed in 2024.

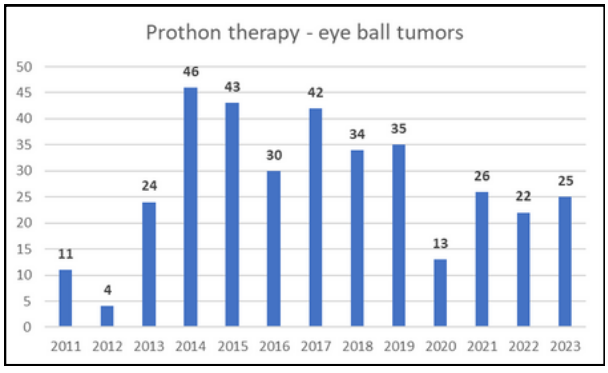
LER was also involved in the creation of a low-level underground laboratory in the Wieliczka and Bochnia salt mines based on scientific cooperation agreements concluded between these units and IFJ PAN. The salt mines were used for radioactivity measurements, among other with the help of a portable gamma radiation spectrometer, measurements of dose rate equivalent and measurements of radon concentration. The works were also conducted by the Laboratory of Radioactivity Analyses of IFJ PAN. A publication covering these studies is in preparation. In 2023, the Laboratory of Radiometric Expertise coordinated the organization of trainings on radiological protection of patients for employees of specialist hospitals in Kraków and Bochnia.

On May 22-26, 2023, the Laboratory of Radiometric Expertise of IFJ PAN held the International Workshop "Radon in the Environment 2023" combined with comparative field measurements of radon concentration in soil and radon exhalation from soil. The purpose of the meeting was to exchange experience and knowledge and establish scientific cooperation. The workshop was devoted to studies of radon in the environment and its impact on health. 14 participants took part in the meeting, including 6 from abroad (Japan, Slovakia, Australia).

PROTHON THERAPY

In 2023, a total of **337 patients** underwent proton therapy at the IFJ PAN Cyclotron Centre Bronowice, 25 of whom completed a series of irradiations in the ocular radiotherapy facility (eye ball tumors). Series of irradiations in the gantry facilities (tumors localized outside of the sight organ) were completed by **259 adult and 53 pediatric patients.**





DIVISION OF SCIENTIFIC EQUIPMENT AND INFRASTRUCTURE CONSTRUCTION

- The Division of Scientific Equipment and Infrastructure Construction IFJ PAN continues its involvement in the project of the construction and launch of the European Spallation Source (ESS). The Ministry of Education and Science grants the IFJ PAN's request and awards additional funds for the execution of the next task in 2023-2024 in the amount of **3.73 mln PLN**.
- IFJ PAN's involvement in the construction of the ESS is once again recognized, this time by the institutions taking part in the construction of the ESS accelerator: **dr hab. Dariusz Bocian, IFJ PAN Scientific and Technical Director, is appointed the chair of the ESS Accelerator Collaboration Board.**
- The Ministry of Education and Science appreciates the high level of the Polish in-kind contribution into the ESS by IFJ PAN by nominating **dr hab. Dariusz Bocian, IFJ PAN Scientific and Technical Director for the ESS Accelerator, to an expert of the Polish delegation to the ESS Council.**
- The Ministry of Education and Science once more appreciates the high level of the Polish in-kind contribution into the ESS by IFJ PAN and its collaboration with different institutions on the implementation of the ESS project by nominating mgr inż. Jacek Swierblewski to the Polish Industry Liaison Officer (ILO) for the ESS.
- DAI's participation in the development works on the plasma diagnostics system (Radial Neutron Camera) in the ITER project results in the completion of the third campaign of diamond detector testing at IFJ PAN.
- As part of the preparations for Long Shutdown 3 and the execution of a contract concluded with CERN, DAI develops and modernizes measurement systems for the quality control of the LHC superconducting circuits.
- IFJ PAN and GSI extend an agreement on cooperation and involvement of DAI engineers and technicians into the preparations for the installation of the FAIR accelerator components. DAI begins its involvement into the SIS100 and SFRS string tests in Darmstadt. The total involvement of DAI employees into the execution of the tasks is 11 FTE.
- Department and the Department of the Ultrarelativistic Nuclear Physics and Hadron Interactions (NZ23) gain the favor of the Ministry of Education and Science and receive funds for their participation in the development of the ALICE detector by IFJ PAN at CERN over the years 2023-2028.