INSTITUTE OF PHYSICS BELGRADE (IPB)

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INSTITUTE OF PHYSICS BELGRADE

IPB was founded in 1961 with a mandate to support fundamental research of the highest level in the physical sciences. With strong national and regional roots, the institution has grown in size and relevance, and its mandate has expanded to include interdisciplinary collaborations, development and transfer of new technologies and skills, and the maintaining of key services and infrastructures.

IPB is the first national institute of the Republic of Serbia and its largest institution in the physical sciences

IPB MISSION

IPB is tasked with the forging of wider societal relevance through research, innovation, and educational excellence.

Principle Roles:

- Contributing to Serbia's international competitiveness and innovative strength
- Nurturing creativity, excellence, and exchange of ideas
- Education and training of highly motivated and talented young people with key competencies

IPB TODAY

4 EU Centers of excellence, 22 laboratories, competitive research infrastructure.
Innovation center, CERN-Serbia Industrial Liaison Office (ILO), Workshops, Spin-off companies, Extended communications and outreach program. New organizational units: Center for Analysis and Development, Verrocchio Center.

Human resources:

- 125 senior researchers, 75 doctoral students
- 30 administrative staff, 20 technicians
- 50 engineers in spin-off companies

KEY OUTCOMES

1% of Serbia's research sector, producing 10% of the country's scientific output.

Leading Serbian participation in international projects and collaborations. Strategic partnerships with CERN, INFN and DESY. Focal point for reintegration of experts from Serbia's Diaspora.

CENTERS OF EXCELLENCE

IPB hosts the following four Centers of Excellence (recognized at national an EU levels):

- **Photonics Center** (Classical and quantum optics, holography)
- **Center for Solid State Physics and New Materials** (Microscopic and spectroscopic characterization of materials)
- **Center for the Study of Complex Systems** (Ultracold quantum gases, nonlinear dynamics, strongly correlated electronic systems, electronic transport in materials, granular materials, techno-social, biological, and nano complex networks)
- **Center for Non-Equilibrium Processes** (Low-temperature plasmas and gas discharges)

Roughly 75% of IPB researchers work in its Centers of Excellence, and these units represent most of the priority areas of research undertaken at IPB.

LABORATORIES / RESEARCH GROUPS

IPB currently has 22 research laboratories:

1. Laboratory for Atomic Collision Processes
2. Laboratory for Quantum Biophotonics
3. Laboratory for Statistical Physics of Complex Systems
4. Scientific Computing Laboratory
5. Laboratory for Photoacoustics
6. Laboratory for Biophysics
7. Laboratory for Electronic Materials
8. Solid State Physics Laboratory
9. Nonlinear Physics Laboratory
10. Nonlinear Photonics Laboratory
11. Laboratory for High Energy Physics
12. Laboratory for Plasma Spectroscopy and Lasers
13. Environmental Physics Laboratory
14. Nanostructured Matter Laboratory
15. Laboratory for Laser Interaction with Materials and Lasers
16. Laboratory for Astrophysics and Physics of Ionospheric
17. Laboratory for Graphenand2D Materials
18. Low Background Laboratory for Nuclear Physics
19. Biomimetics Laboratory
20. Laboratory for Non-Equilibrium Processes and Plasma Applications
21. Laboratory for Physics of Materials under Extreme Conditions
22. Gravity, Particles and Fields Group

STRATEGIC INVESTMENTS

- IPB is one of six Serbian Research and Development Institutes (RDI) participating within the Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE), a strategic project funded and realized through a partnership of the Republic of Serbia, World Bank and the European Union providing additional investment into research, technological development and innovation needed to implement the chosen institutions ten-year Transformation Plans.

- IPB's Verrocchio Center (specialized facilities for education and training, and for innovation and commercialization) is under construction (funded by the Government of Serbia).

AGREEMENTS AND PARTNERSHIPS

- On 24 March 2019, Serbia became 23rd member of CERN. IPB has played an important role in making this a reality. IPB researchers are prominent members of the National Committee for the Cooperation of Serbia with CERN. IPB hosts the CERN-Serbia Industrial Liaison Office (ILO).

- Serbia signed the Agreement on Joining the Horizon Europe Research & Development Program on 06.12.2021. From the start of the new EU Program IPB is taking an active role and **is currently the coordinating institution for four projects** (1 ERA Chair, 1 ERC Grant, 1 MSCA, 1 Widera Twinning project) and **partner in another four HE projects**.

- IPB has signed strategic partnerships with CERN, INFN, and DESY that define its collaboration (principally through Verrocchio Center) with these institutions. Principle areas of collaboration are related to the development of new generations of accelerators and detectors. IPB contributes to this wider endeavor with its expertise in supercomputing (modeling of complex systems, collection, visualization, and analysis of large data sets), and the development and application of new non-invasive systems.

- On 3 February 2022 IPB signed its first strategic partnership with a domestic institution: Faculty of Mechanical Engineering of the University of Belgrade.

- International activities -

IPB is the recognized leader in Serbia in international collaboration, researcher mobility and in successful participation in competitive projects (international and national) both in research and in innovation.

IPB has championed Serbia's entry into CERN member status. Its researchers are active in several CERN collaboration (e.g., ATLAS, SHIP, HPC. IPB staff is also participating on ongoing CERN activities related to education and training, and on communication and outreach. The Serbia-CERN Industrial Liaison Office is located at IPB, while IPB's new Verrocchio Center is strongly focused on long-term research, innovation and commercialization activities with CERN.

IPB maintains ongoing ties and exchange of information with staffs of several embassies (Notable examples: Italy, Switzerland). **INTERNATIONAL PROJECTS**

- In the last few years IPB researchers have been active in more than 200 international projects. Principle funding agencies: EU (Horizon, COST), Switzerland (SCOPES), China, QNRF Qatar, NATO (Partnership for Peace), as well as many individual countries through bilateral projects, inter-academy projects, and various fellowships (e.g., Humboldt), etc.
- In 2023, IPB hosted and coordinated two ERC Grants, one Twinning, and two MSCA projects. It participates as a partner in a host of other active international projects, including four within Horizon Europe. IPB researchers are involved in 18 COST actions. IPB's ongoing bilateral projects and multilateral projects are with: Germany, Austria, France, Slovakia, Slovenia, Hungary, China, Japan, India.
- IPB hosts the National Contact Person for COST actions.

Active HE and H2020 projects in 2023/2024

1.	A novel Quark-Gluon Plasma tomography tool: from jet quenching to exploring the extreme medium properties	QGP tomography	H2020 ERC-2016-COG	725741
2.	Direct Experimental probe of the Lorenz invariance violation in the Top-quark physics at the ATLAS experiment.	DELTA	H2020 MSCA-IF-2020	101033496
3.	Joint PhD Laboratory for New Materials and Inventive Water Treatment Technologies. Harnessing resources effectively through innovation	NOWELTIES	H2020 MSCA-ITN-2018	812880
4.	National Initiatives for Open Science in Europe	NI4OS-Europe	H2020-INFRAEOSC-2018-2020	857645
5.	Twinning for excellence of the Serbian Research center for quantum biophotonics	BioQantSense	HORIZON-WIDERA-2021-ACCESS-03	101079355
6.	Numerically exact theory of transport in strongly correlated systems at low temperature and under magnetic fields	SCLoTHiFi	HORIZON-ERC-2022-STG	101076100
7.	Young planetesimal belts	YPB	HORIZON-MSCA-2021-PF-01	101064124
8.	moleculARmaTerials for on-chip intEgratedquantuMIIghtsourceS	ARTEMIS	HORIZON-EIC-2022-PATHFINDERCHALLENGES-01	101115149
9.	EOSC Beyond: advancing innovation and collaboration for research	EOSC Beyond	HORIZON-INFRA-2023-EOSC-01	101131875
10.	Hidden phases in 2D quantum materials	HIP-2D-QM	HORIZON-WIDERA-2023-TALENTS-01 ERA Chair	101185375
11.	Skills4EOSC: Skills for the European Open Science commons: creating a training ecosystem for Open and FAIR science	Skills4EOSC	HORIZON-INFRA-2021-EOSC-01	101058527

Full list of IPB's EU projects: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/org-details/999584904

COMMERCIAL PROJECTS

We list only commercial projects that IPB is directly involved in (not the projects of IPB spin-off companies).

- IPB participates in two commercial projects with Siemens (Germany), one with JPL (USA), and two with NIS (Serbia).
- In addition, IPB researchers participate in several ongoing environmental monitoring projects funded by relevant municipalities and government agencies.
- Through its accredited measurement laboratories IPB implements ongoing specialized measurements for domestic and foreign customers.

Direct commercialization, on the other hand, is mainly carried out through IPB's technological spin-off companies. The two largest such companies are currently **SENZOR-INFIZ** (application of optical sensors and laser technology)**https://senzor-infiz.com/**and **MTT-INFIZ** (application of microwave technology and radar systems)**https://www.mtt-infiz.com/**.

NATIONAL COMPETITIVE PROJECTS

In Serbia, national competitive projects are conducted by two agencies: Science Fund and Innovation Fund. Since their inception, both funds conduct regular calls for projects through similar procedures to those of Horizon Europe and utilizing international experts for project selection.

IPB has been the most successful institution in all the calls conducted by these funding agencies to this date. There 23 currently active domestic projects and 22 internally funded research project at IPB.

- Social media channels and communication activities -

IPB is actively engaged in the promotion of science and physics to the public, and works with media outlets to ensure quality science reporting. As first national institute of Serbia and leading institution in the physical sciences IPB is always available to journalists working in all forms of media. Our Communications Department provides all the necessary support, both in content and logistics, not just when it comes to reporting on the Institute, but for project purposes and science journalism in general. IPB organizes workshops and other types of activities with the goal of supporting media coverage of science.

EUROPEAN PARTICLE PHYSICS COMMUNICATION NETWORK

The Communications Department of IPB is part of the European Particle Physics Communication Network, or EPPCN. The network consists of experts from member-states of CERN who work in science communication and cooperate with the public on CERN's portrayal.

PHOTO AND VIDEO ARCHIVE

Photo documentation, including photographs, the Institute's logo and other visual elements are free to use, and can be downloaded from OUR GALLERY. The only requirement is to attribute the authors, iflisted.

VRT FIZIKE - Garden of Physics POGLED U FIZIKU - A Glance at Physics - video series

Along the banks of the Danube in the Zemun suburb of Belgrade, not far from the Mihajlo Pupin bridge, IPB nurtures a green oasis where the video series "Garden of Physics" is filmed. The series is produced by the Institute in cooperation with the "Science through stories" initiative inspired by the concept of the popular IPB forums, which until the epidemic gathered a large audience in the Great Hall of the Students Cultural Center (http://naukakrozprice.rs/tag/tribine/). Instead of live talks in front of an audience, we now make videos of talks with researchers in IPB's garden.

A Glance at Physics is a video series of the Institute of Physics Belgrade which talks about individual projects and research conducted at the Institute in short episodes. New episodes are posted every Friday on the Institute's YouTube channel, website and social networks.

"Nauka kroz price - Science trough stories" - popular science web page

Founded as a private initiative, "Science through stories" immediately received institutional support from IPB. The initiative is further supported by a wide network of individuals throughout society. Together with them, NKP participates in several international and domestic projects. The page is run by three science journalists, employed by IPB in its Communications and Outreach Department.

This December, IPB, in cooperation with the "Naukakroz price", is organizing a unique school of scientific journalism, known as Medialab. The previous school, organized before the Covid-19 outbreak, was completed by 25 participants, young journalists, and scientists, many of whom have opted for a career in journalism and now work for leading domestic media.

IPB media channels:

1. Web site **www.ipb.ac.rs** in Serbian and English
2. FB **@ipb.ac.rs**
3. YouTube - video**https://www.youtube.com/channel/UCVvwADooA6K19sCzZQsIZwQ**
4. Garden of Physics: **http://naukakrozprice.rs/tag/vrt-fizike/**
5. Naukakroz price: **naukakrozprice.rs**& FB **@NaukaKrozPrice**