

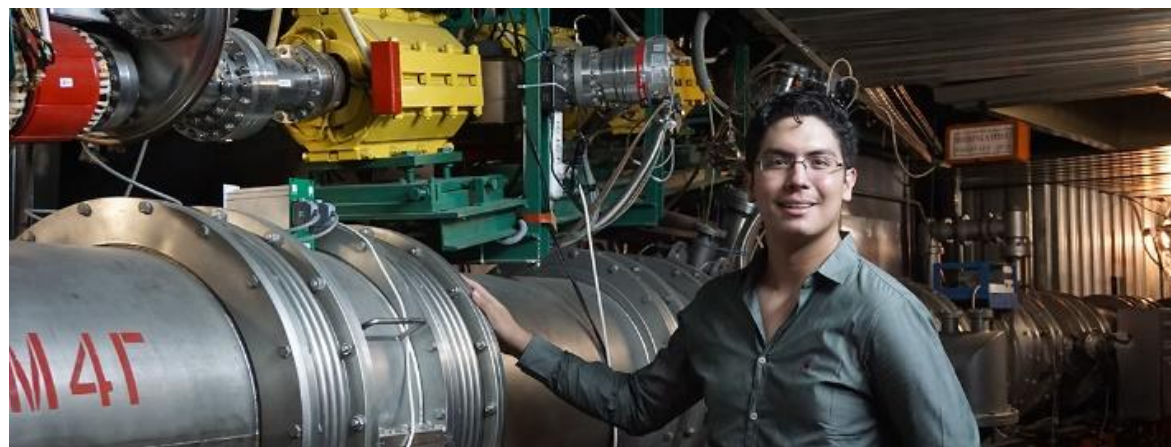
# JINR

Joint Institute for Nuclear Research  
**OPPORTUNITIES**  
for students

Prof. Stanislav Pakuliak  
JINR UC Director

E-mail: [pakuliak@jinr.ru](mailto:pakuliak@jinr.ru)

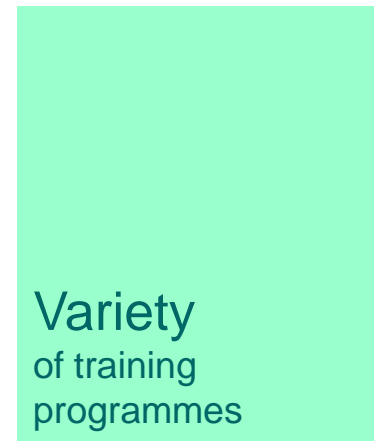
Website: [uc.jinr.ru](http://uc.jinr.ru)



World-class  
research projects



Educational  
programmes  
for students



Variety  
of training  
programmes



Wide range  
of research fields



# Outline

- About JINR University Centre
- International Student Practice
- Summer Student Programme
- Hands-on workshops for future engineers
- Practice and training for researchers and engineers
- Open education at JINR
- JINR outreach programmes
- More opportunities
- Science brings nations together



# What is **JINR** University Centre?

Attracting youth to science

The main fields  
of activity are:



## Student programmes

- BS and MS theses at JINR
- International Student Practices
- Summer Student Programme
- Conferences for young scientists and specialists

## Science popularisation

- Scientific Schools for physics teachers at JINR and CERN
- Visits to the JINR labs for students
- Open resource [edu.jinr.ru](http://edu.jinr.ru)
- Science festivals

## Skill improvement

- Advanced practices
- Attachment of degree-seekers
- Engineering training
- Professional course
- Foreign language course

To ensure the effective  
use of JINR facilities  
and expertise

To train highly qualified  
scientists and engineers  
from the Member States

To bring up-to-date scientific knowledge  
to the general public and to highlight  
recent scientific achievements of JINR

# Start your career at JINR



- World-class scientific research
- Wide range of research areas
- Qualified supervision
- International collaboration & fruitful contacts
- Variety of training programmes

# International Student Practices

3 weeks

Started in **2004**

Total number of participants – **1762**

## Practice participants

- get an idea about the JINR fields of research
- can work at the basic facilities of the Institute under supervision of the leading experts
- have an opportunity to choose a future scientific supervisor
- make fruitful contacts
- enjoy the Russian culture



## June

South Africa

## July

Azerbaijan, Bulgaria,  
Czech Republic,  
Poland, Romania,  
and Slovakia

## September

Belarus, Cuba,  
Mongolia, and Serbia

## December

Egypt

# International Student Practice **activities**

**3 weeks**











- Introductory lectures
- Visits to the JINR labs
- Work on the projects in international scientific groups
- Final presentation of the projects

# Database of Research Projects

≈100 projects  
available in 2019

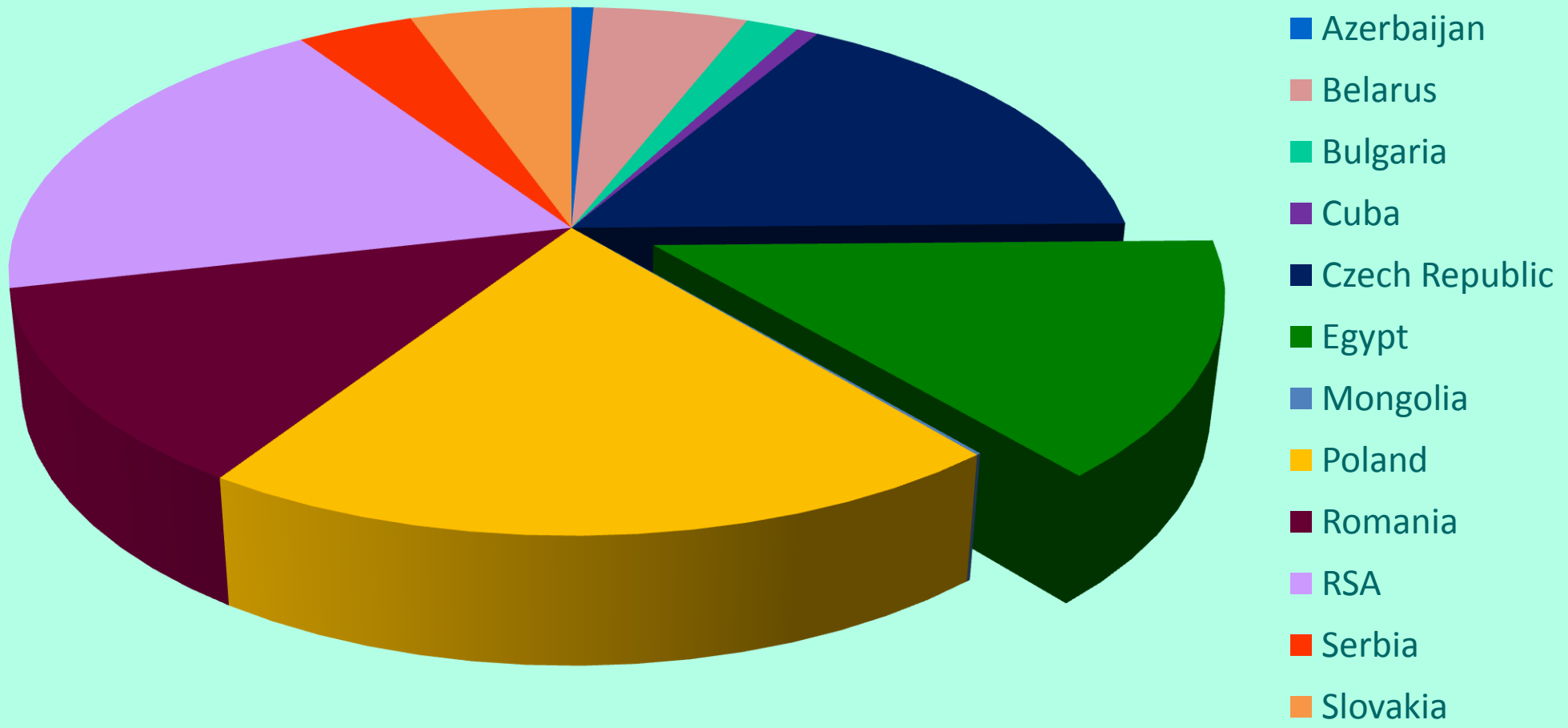
<http://ucnew.jinr.ru/ru/project-database>

Laboratory of Information Technologies (LIT)

Nº	Supervisor	pdf	Name of the project
1.	<i>D. Podgainy</i> <i>A. Nechaevskiy</i> <i>O. Streltsova</i>		High-performance computing for scientific and applied problems
2.	<i>B. Saha</i>		Numerical and analytical calculations in gravitation and cosmology
3.	<i>Yu. ...</i>		Modeling of the behavior of particles in hot nuclear matter
4.	<i>O. ...</i>		ROOT package in High Energy Physics tasks
5.	<i>G. Ososkov</i>		Machine learning applications for plant disease detection
6.	<i>I. Pelevanyuk</i>		Advanced system administration for fast server configuration
7.	<i>N. Kutovskiy</i>		Advanced computing technologies (Grid, Cloud, HPC). Practical usage of EMI, OpenNebula middleware and key parallel programming technologies
8.	<i>I. Sarkhadov</i>		Numerical modeling of thermal processes arising in the materials under exposure to pulsed ion beams and single high energy ions
9.	<i>O. Chuluunbaatar</i> <i>Yu. Popov</i>		Calculation of the strong field approximation term for the hydrogen atom excitation in intensive laser field
10.	<i>Gh. Adam</i> <i>M. Dima</i>		Applied C and C++ in Physics



# Practice participants representation



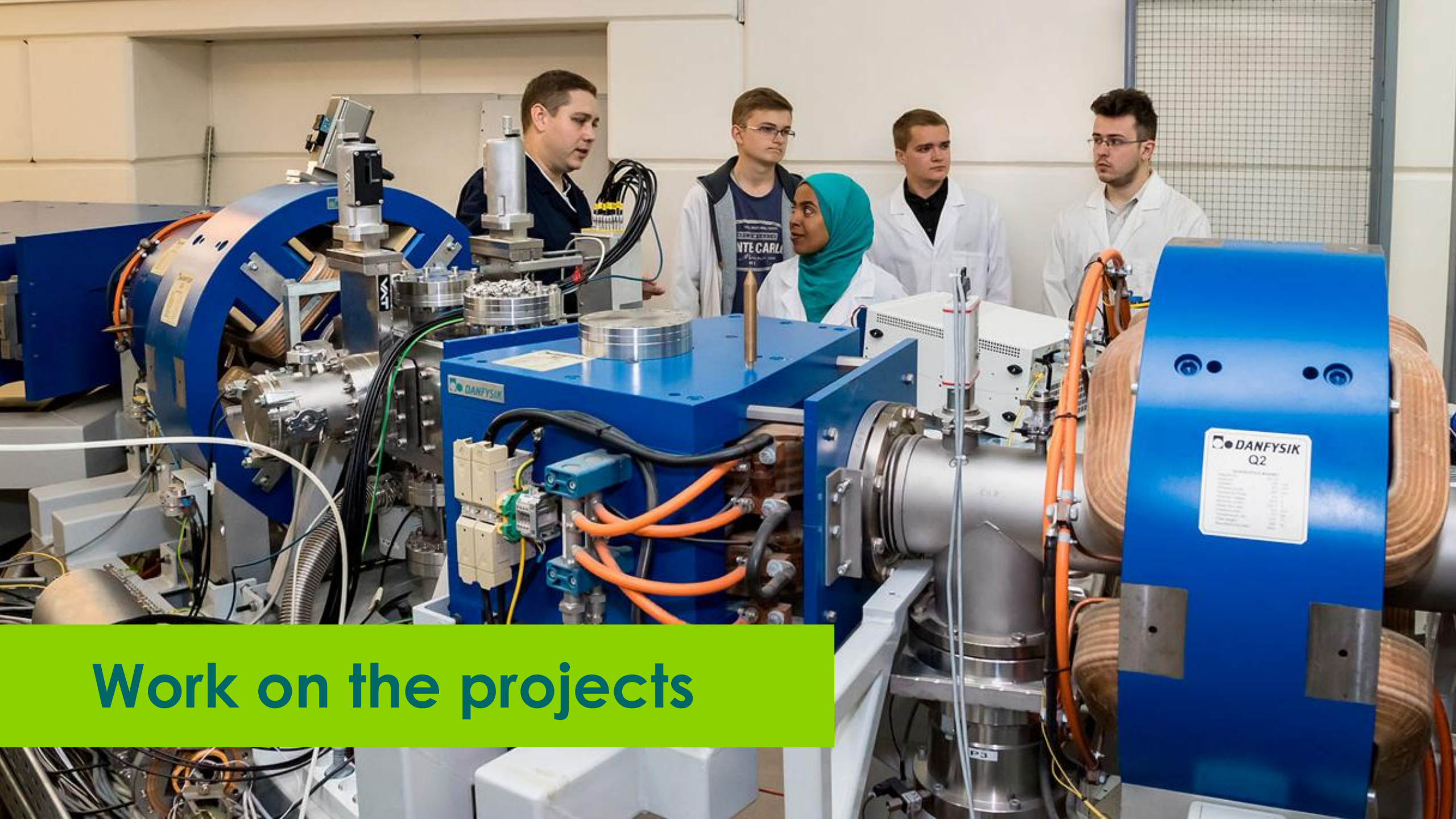
Total number of participants since 2004 – 1762, **250** – from Egypt



# Introductory lectures



# Visits to the JINR labs



**Work on the projects**

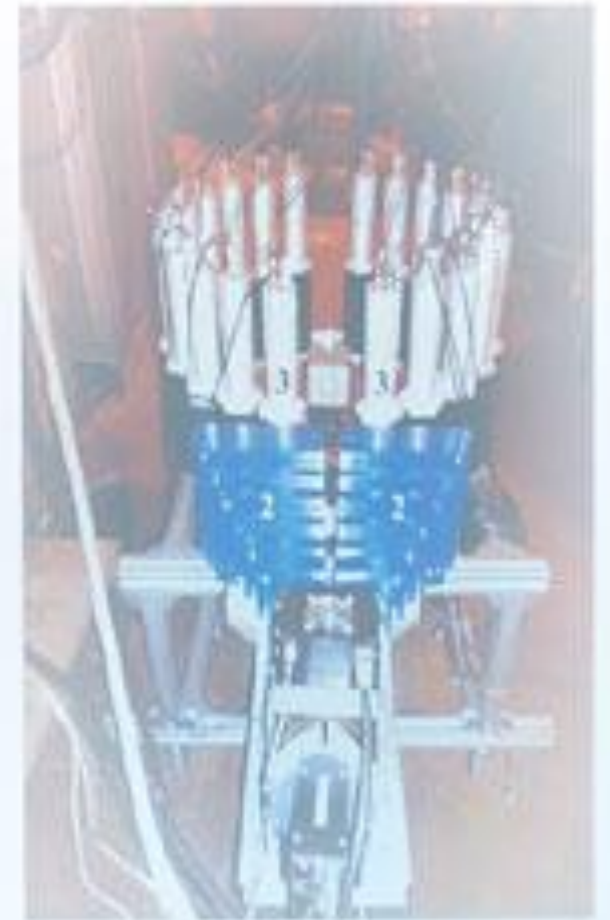
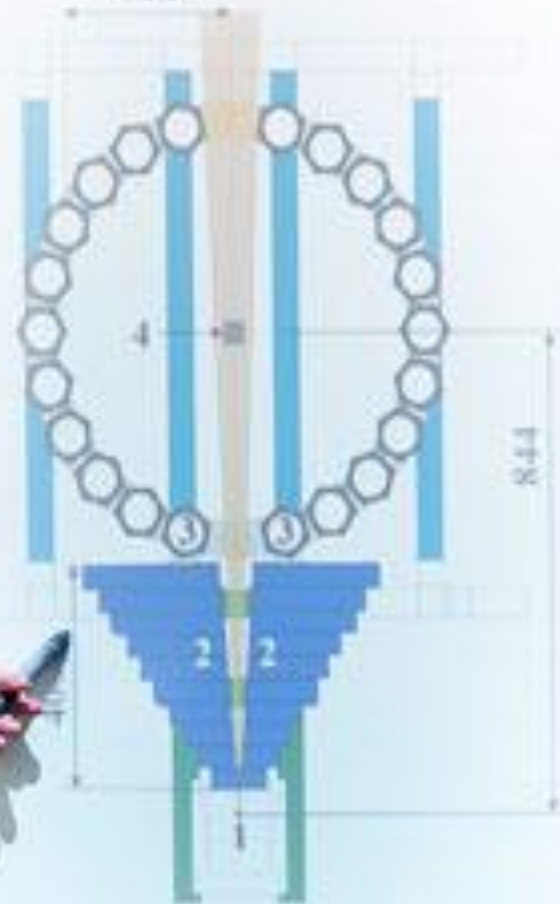


**Work on the projects**

# Final project presentation



The scheme of G $\beta$ -geometry (left) and photo (right) of the "source-detector" part of the experimental system - neutron source ING-27, field-collimator of lead and  $\gamma$ -rays, 3 - NaI(Tl) scintillation detectors of  $\gamma$ -rays and 4 - carbon  $^{12}\text{C}$  target. Main dimensions in cm are shown in the diagram.





# Certificate ceremony



# Certificate ceremony



# Summer Student Programme

Launched in **2014**

- Competitive selection
- Longer term (6-8 weeks)
- Advanced level of projects
- 4<sup>th</sup> year Bachelor students,  
Master students,  
1<sup>st</sup> year PhD students

[students.jinr.ru](http://students.jinr.ru)



Application for JINR SSP-2020 will start in January

# International Student Practice vs Summer Student Programme

3 stages: June, July, September

June-October

3 weeks

6-8 weeks

Introduction to JINR research fields

More profound research at JINR

Students arrive as a group

Students arrive separately

Selection by local organisers

Selection by JINR

Projects

Scientific areas of interest

Final presentations of projects

Final written reports published  
on [students.jinr.ru](http://students.jinr.ru)

# SSP fields of research <http://students.jinr.ru/en/research-fields>

## Summer Student Program

at Joint Institute for Nuclear Research

HOME

ABOUT JINR

PARTICIPANTS



It's neither a school nor a conference. It's pure practice

Applications admission closed

Applications review and selection by supervisors: 21 Apr 2017, 21:00

Participants list publication: 25 Apr 2017, 19:00

SUMMER PROGRAM - 2017

[Fields of research](#)

[Contacts](#)

[Sponsors](#)

[How to get](#)

[Organizers](#)

[News](#)

[Submit news](#)

## Purpose and Imp

About the Program

### Program Purpose

The main purpose of the Summer Student Program is to provide students from Member States on a contract basis with the opportunity to participate in scientific projects.

### Program Dates

The Summer Student Program is organized by scientific groups and works during the summer months of each year.

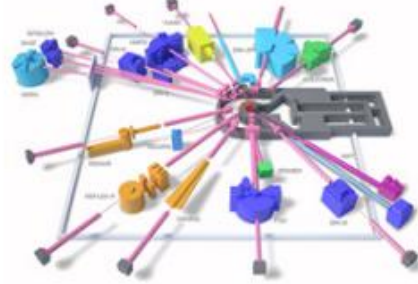
### Program Participants

Participants of the Program are students or PhD students from the Member States and other organizations of the JINR.

### Application Procedure

To participate in the selection process, you need to fill out the application form and submit it to the JINR.

## Condensed Matter Physics



Investigations of Condensed Matter by Modern Neutron Scattering Methods  
Multimodal Platform for Raman and Nonlinear Optical Microscopy and Microspectroscopy for Condensed Matter Studies

In the laboratories of the Institute, theoretical and experimental research in condensed matter physics is carried out. It includes spectroscopic studies of hydrogen bonding; behavior of surfactants, polymers and their mixtures in the volume and on the surface; study of plasmonic nanostructures in the pores of silicon oxide using Raman, SERS and CARS spectroscopy methods; structural analysis of complex nano- and micromaterials using small-angle neutron scattering; computer simulation of the tunnel characteristics of superconducting nanostructures, etc.

## Networking, Computing, Computational Physics



processing of experimental data.

Information and Computing Infrastructure of JINR  
Methods, Algorithms and Software for Modeling Physical Systems, Mathematical Processing and Analysis of Experimental Data

JINR Laboratory of Information Technology ensures creation and further development of the JINR information and computer infrastructure, methods, algorithms and software for the modeling of physics systems, mathematical processing and analysis of experimental data. The following areas are being developed: monitoring of distributed information and computer systems; data storage systems and technologies; parallel programming technologies MPI, OpenMP, CUDA, MPI+CUDA; hybrid architectures; Big Data; cloud technologies; development of information systems; development and analysis of mathematical models of quantum computing and quantum information; information methods of data and social networks analysis; computational methods in physics; mathematical methods for simulation of complex physics systems; development of algorithms of parallel computing; mathematical methods and software for

## Radiobiology

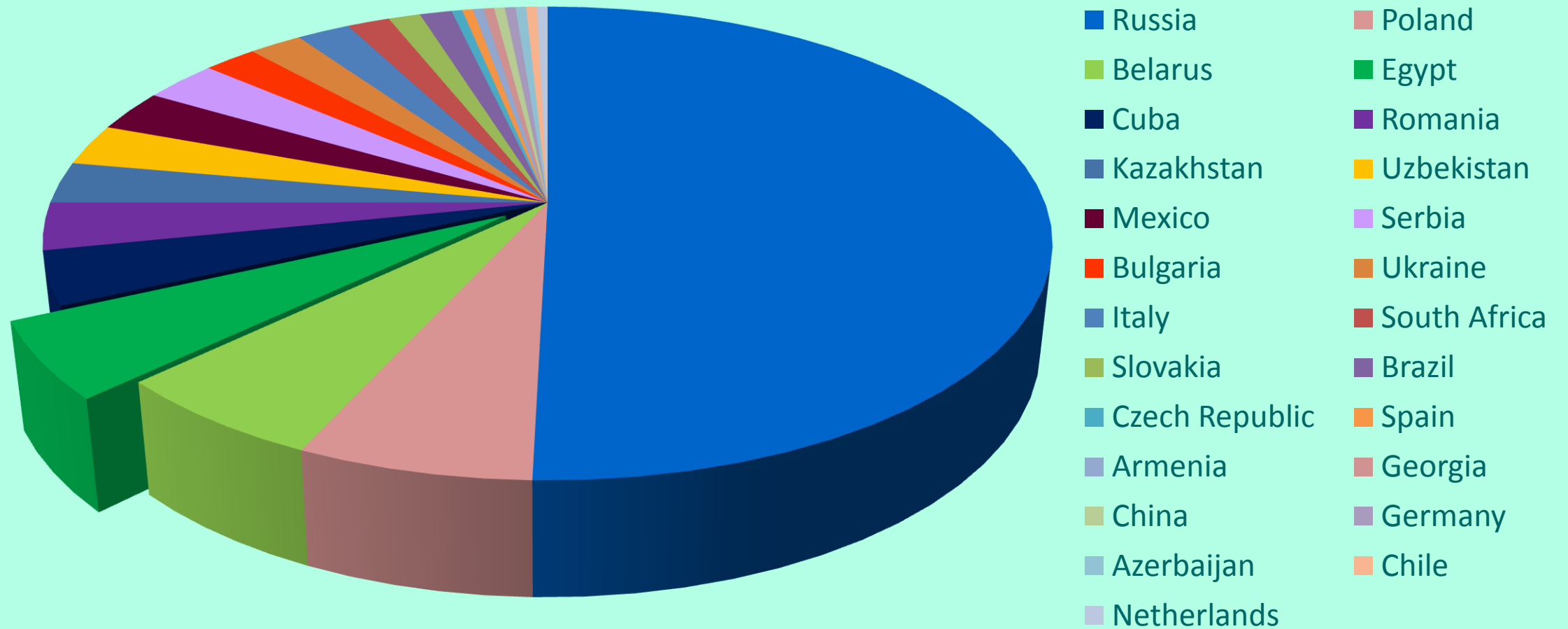


Research on the Biological Effect of Heavy Charged Particles with Different Energies  
Research on Cosmic Matter on the Earth and in Nearby Space; Research on the Biological and Geochemical Specifics of the Early Earth

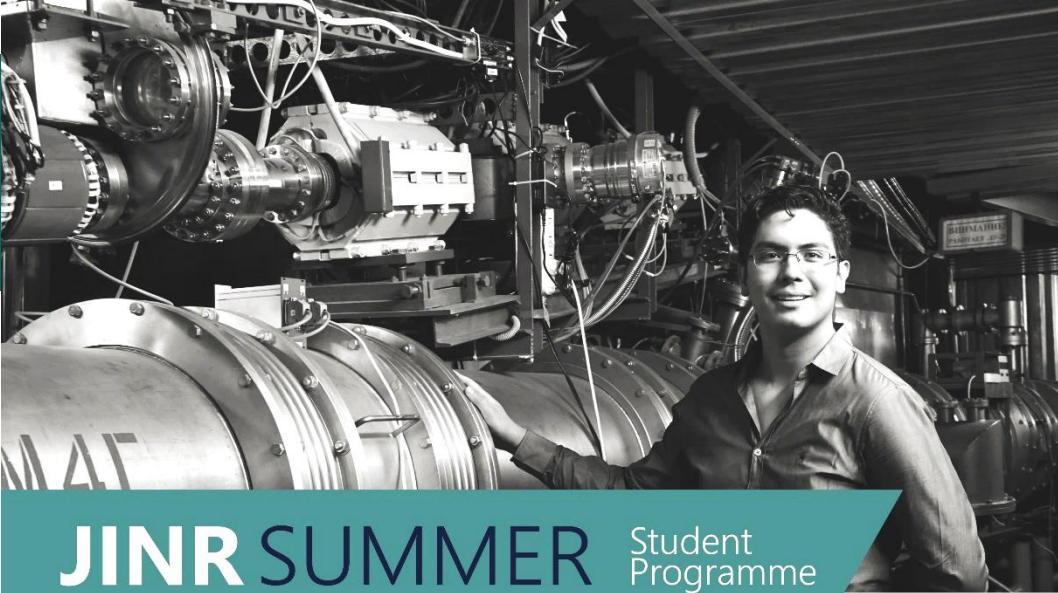
In the JINR Laboratory of Radiobiology, theoretical and experimental issues of biological effects of heavy charged particles of different energies are studied. Cosmic dust and organic compounds in meteorites and ancient terrestrial rocks are also investigated by nuclear physics methods. It allows obtaining data that may reveal the background of the origin of terrestrial and extraterrestrial life.

- Theoretical and Mathematical Physics
- Particle Physics
- Nuclear Physics
- Neutron Physics
- Condensed Matter Physics
- Networking, Computing, Computational Physics
- Radiobiology
- Accelerators Physics
- Particle Detectors
- Applied Research Using Nuclear Physics Methods

# JINR SSP participants representation



Total number of participants 2014-2019 – 248, **13** – from Egypt



# JINR SUMMER Student Programme

Joint Institute for Nuclear Research

## ■ About JINR

- International intergovernmental scientific research organisation in Dubna, Russia
- Main fields of activity:
  - elementary particle physics
  - nuclear physics
  - condensed matter physics
- 7 laboratories, each comparable with a large institute
- Fundamental research integrated with new technology development and training programmes

## ■ About the Programme

- Duration 6-8 weeks
- Profound research projects
- Work in international teams
- Fruitful contacts
- Visits to the JINR Labs
- Social programme
- Written reports on the results

## ■ Participants

- Bachelor students finishing their 3<sup>rd</sup> year
- Master students
- PhD students of the 1<sup>st</sup> year

## ■ Funding & Conditions

- Free accommodation in JINR hostels
- Reimbursement of travel expenses
- Visa and medical insurance support

## ■ How to apply

- Fill in the application form here: [students.jinr.ru](http://students.jinr.ru)
- Highlight the spheres of interest
- Provide a letter of recommendation
- Application deadline – March 30, 2019

Spend your summer holidays at the front line of Science!

# How to apply for the JINR SSP

## STEP 1

During the period:  
January 15 – March 30

Follow the link <http://students.jinr.ru>

<http://students.jinr.ru/>



## STUDENTS FEEDBACKS



**Роман  
Морачков**  
Институт физики ФИЦ КНЦ СО  
РАН

I'm very glad that I participated in JINR student summer program! It was not only interesting scientific project, but there were exciting ex... more

[All feedbacks](#)

Applications admission ends 2019-03-31 23:00

Days left: 32

[Register to submit your application](#)

ЛЕТНЯЯ ПРОГРАММА - 2019

[Contacts](#)

[Sponsors](#)

[How to get](#)

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[Schedule](#)

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[Apply](#)

Remember Me

## Purpose and Implementation of the Program

[About the Program](#)

[Financial Support](#)

[Participant's Final Report](#)

[FAQ](#)

### Program Purpose

The main purpose of the Summer Student Program at JINR is to attract graduate students on a competitive basis to the Institute scientific groups that implement the main JINR research projects.

### Program Dates

The Summer Student Program at JINR will be organized in the form of student research projects in the scientific groups and will last from 4 to 8 weeks during the period from June to October of each calendar year.

### Program Participants

Participants of the Program may be students finishing third or fourth year of bachelor studies, master students or PhD students enrolled in the first year of graduate school.

### Application Procedure

To participate in the selection competition one has to:

- register at the web-page of the Program indicating all necessary contact information;
- fill in the application form in the section "SUMMER PROGRAM - 20\*\*" to participate in the Program of year 20\*\*.

### Recommendations to the Applicants

When applying for the Program, one must indicate the contacts of one reference person only. The Program Committee will send a link to the applicant's profile to the address of the reference person with a request for a letter of recommendation to be written for a potential Program participant. Each applicant will be required to

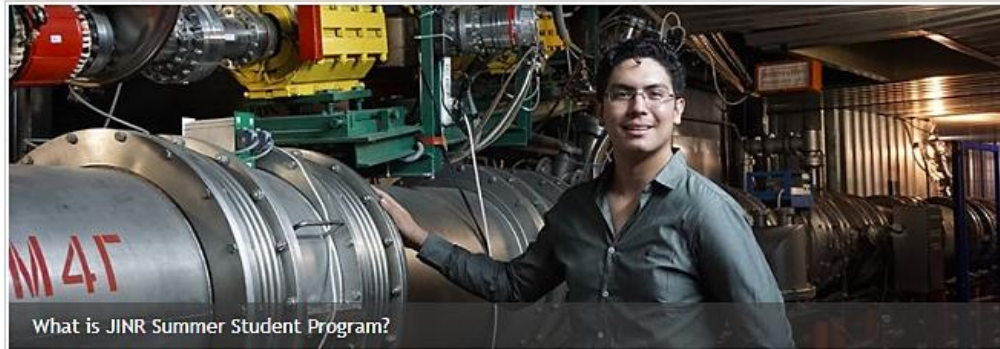
Member States who know the applicants.

Selection of Participants

# How to apply for the JINR SSP

## STEP 2

## Start with registration on the SSP website



What is JINR Summer Student Program?

## STUDENTS FEEDBACKS



Ангелина  
Антонова

МГУ им. М.В.Ломоносова

I'd like to express my gratitude to the whole staff members of the Raman spectroscopy sector and special thanks to my supervisor Dr Grigory... more

[All feedbacks](#)

Applications admission ends 2019-03-31 23:00

Days left: 32

ЛЕТНЯЯ ПРОГРАММА - 2019

[Contacts](#) >

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[How to get](#) >

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[Applications](#)

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- register at the web-page of the Program indicating all necessary contact information:

# STEP 3

Fill in the application form till March 30

- Personal data + photo
- Education information + attach a diploma scan or academic transcript
- Highlight the spheres of interest
- Indicate the name of a recommendation person
- Motivation letter

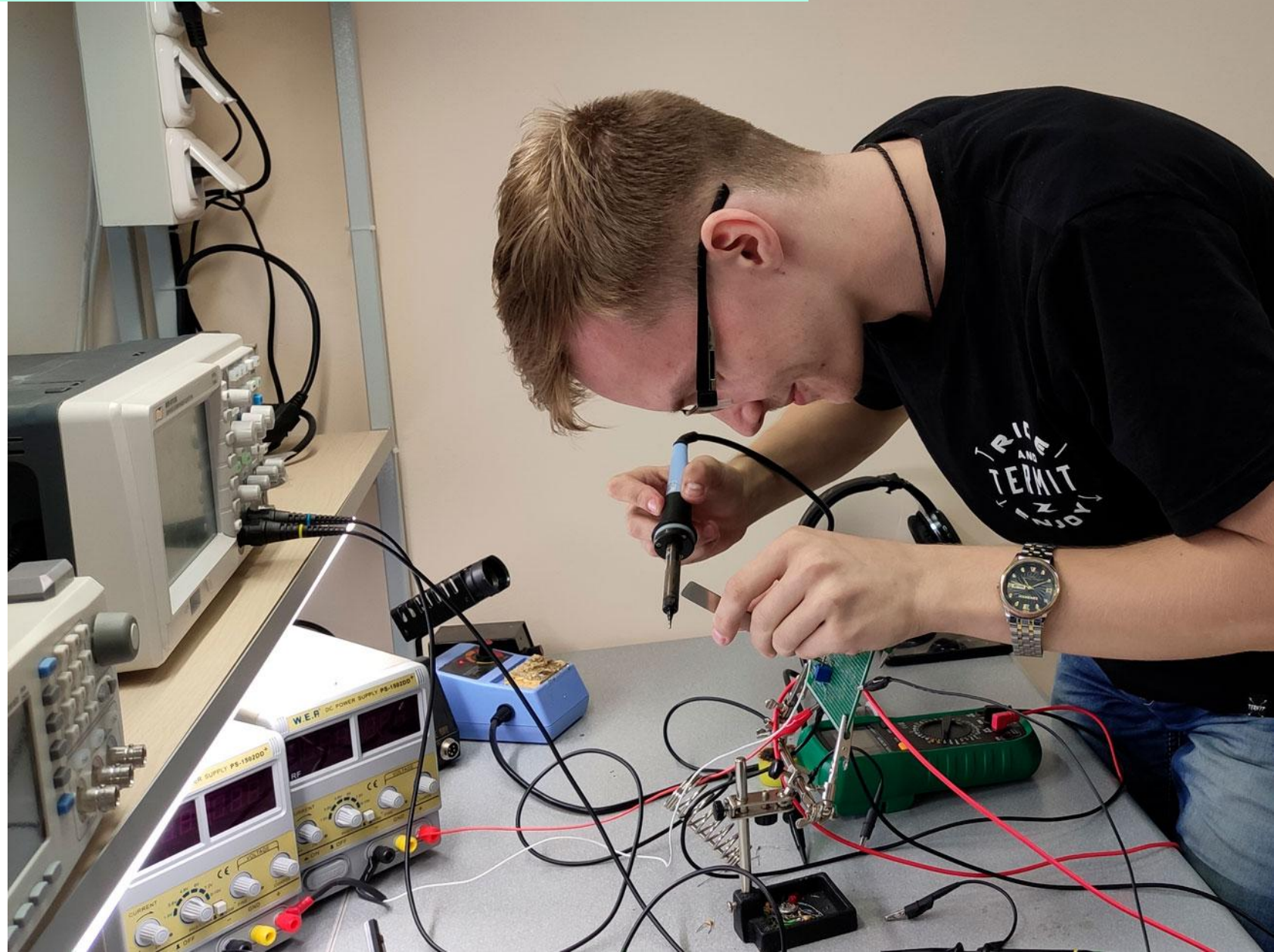
# Hands-on workshops for future engineers

- Basics of nuclear physics
- Radiation protection and safety
- Particle detectors
- Vacuum technology
- RF technology
- Magnets
- Electronics and automation



## Main directions:

- Development of training programmes
- Acquisition of practical skills
- Enhanced training





Dedicated training centre at JINR (since 2014)



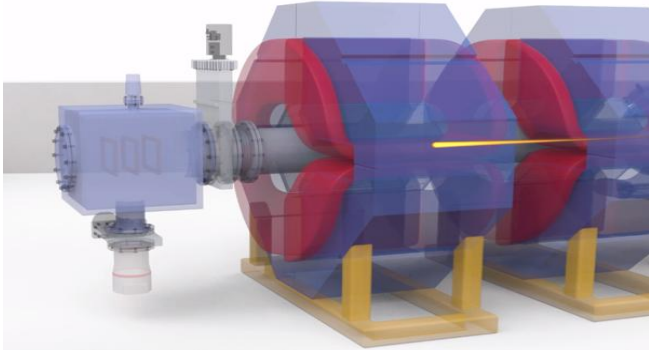
**Usus est optimus magister**

## Motivation

Modern research requires both practical skills and theoretical knowledge.

JINR provides an opportunity to obtain access to radioactive materials, working accelerators, giant experimental setups etc.

# Open education at JINR



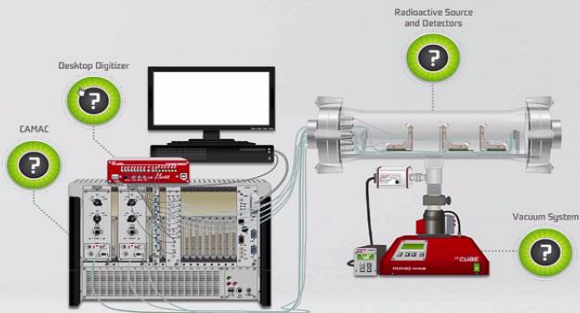
[edu.jinr.ru](http://edu.jinr.ru)

**Educational Web Portal**  
educational multimedia resources:

- Multimedia exhibition about JINR facilities
- Video lessons for university and school students
- Virtual Laboratories for students



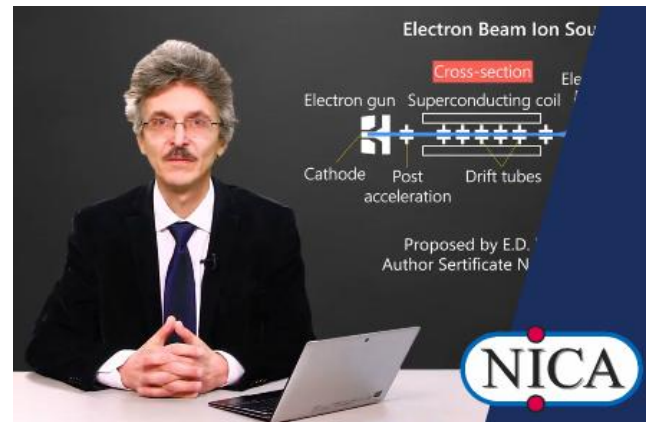
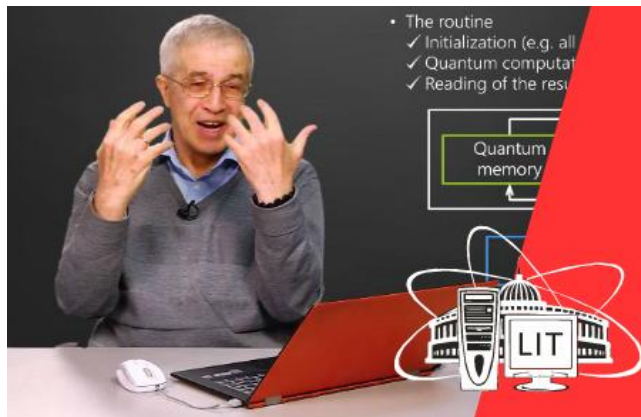
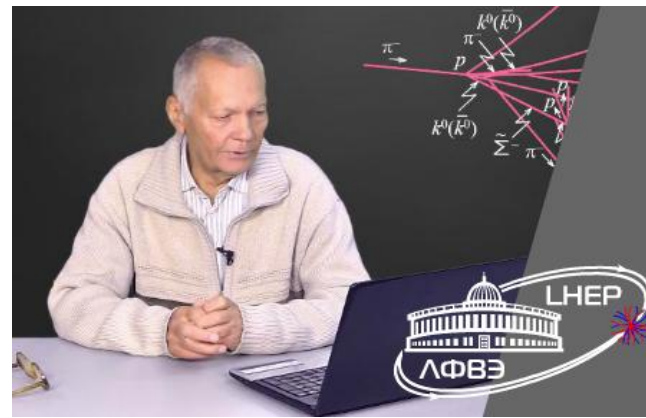
Light Ions Spectrometer - Measurements



# Open education at JINR



## Video lectures



- Experimental high energy physics
- Detectors in nuclear and high energy physics
- Heavy ions and the synthesis of heavy elements
- Megascience project NICA
- Quantum Computation and Quantum Information

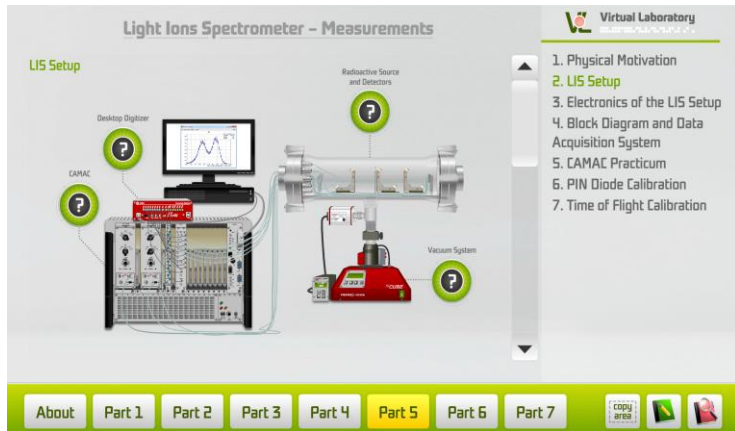


[edu.jinr.ru/courses](http://edu.jinr.ru/courses)

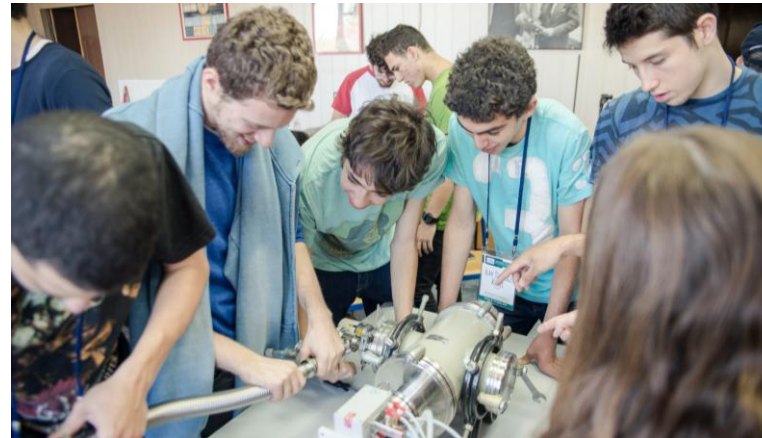
# Open education at JINR



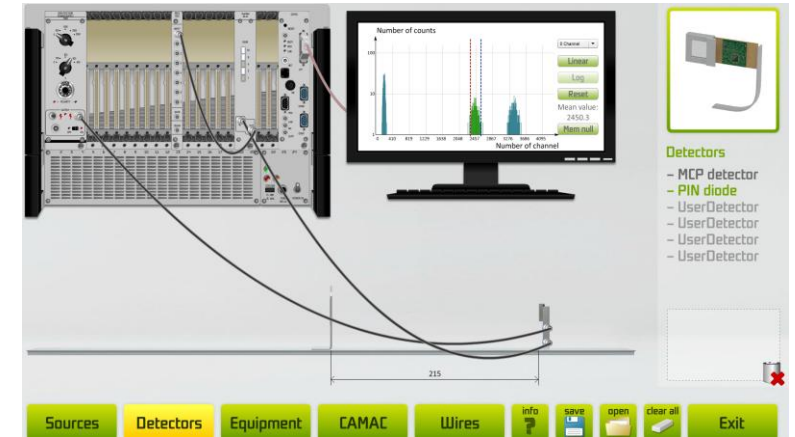
## Educational Project “Virtual Laboratory”



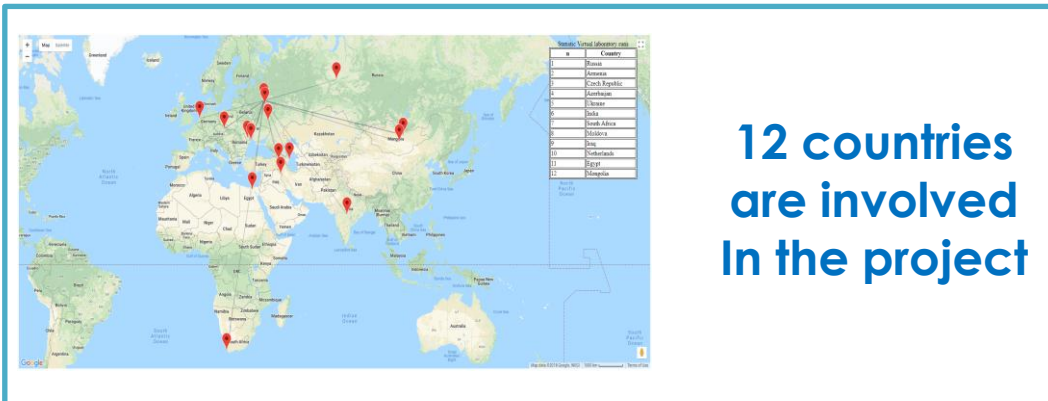
Virtual Laboratory of Nuclear Fission



Hands-on Practicum on Experimental Nuclear Physics for Students



Interactive Environment for Nuclear Experiment Modeling



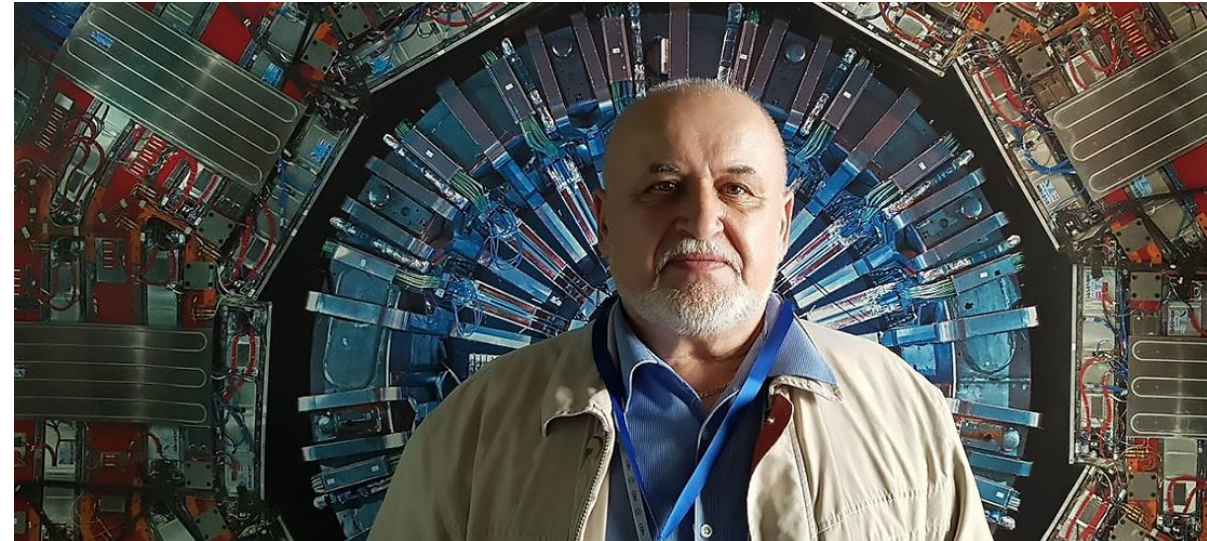
12 countries are involved in the project



[edu.jinr.ru/vlabs](http://edu.jinr.ru/vlabs)

# Outreach programmes

- Festivals of Science
- International scientific schools at JINR and CERN
- Tours of JINR facilities + virtual tours
- And more

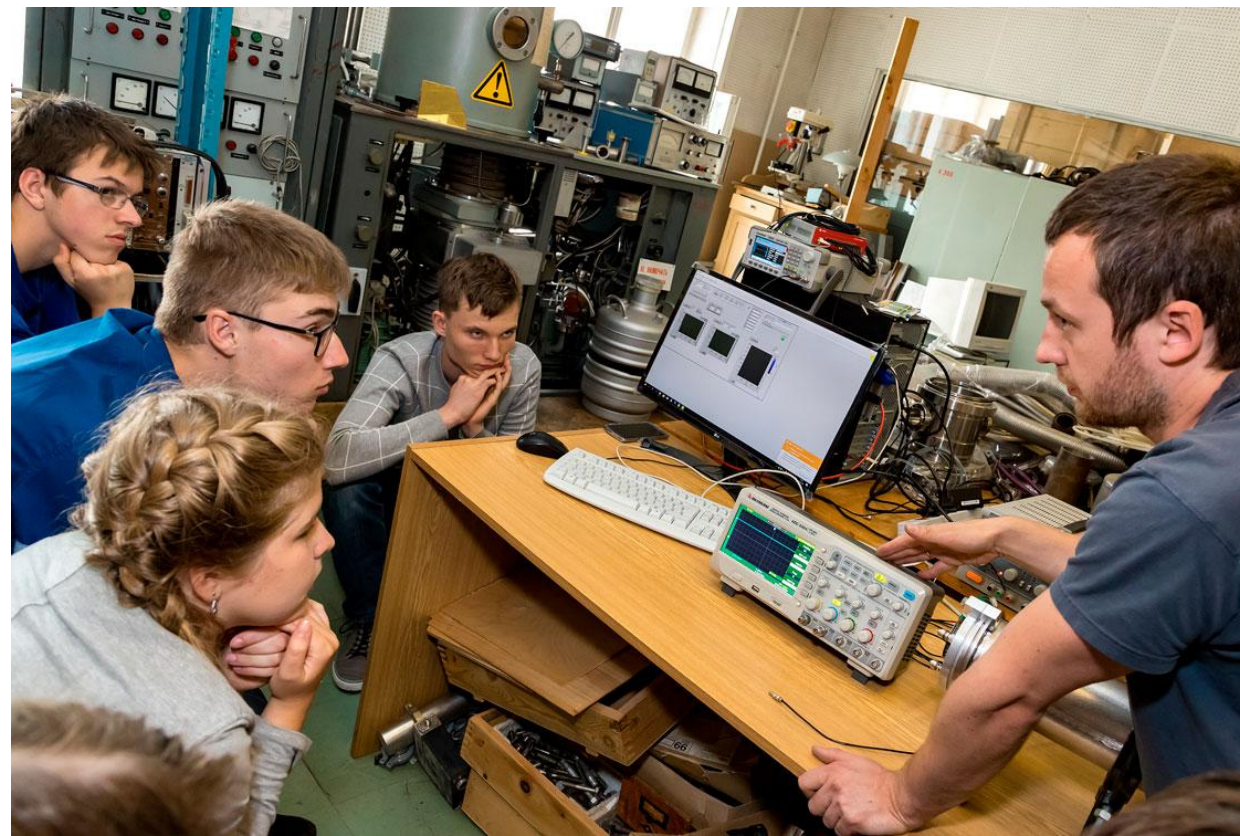


# Group visits for high-school students and their teachers



- Meeting with Academician Yuri Oganessian
- Introductory lectures & visit to the JINR labs
- Hands-on activities

**July, 2019**  
Czech high-school students  
visiting JINR



# Scientific schools for physics teachers

## Basic components:

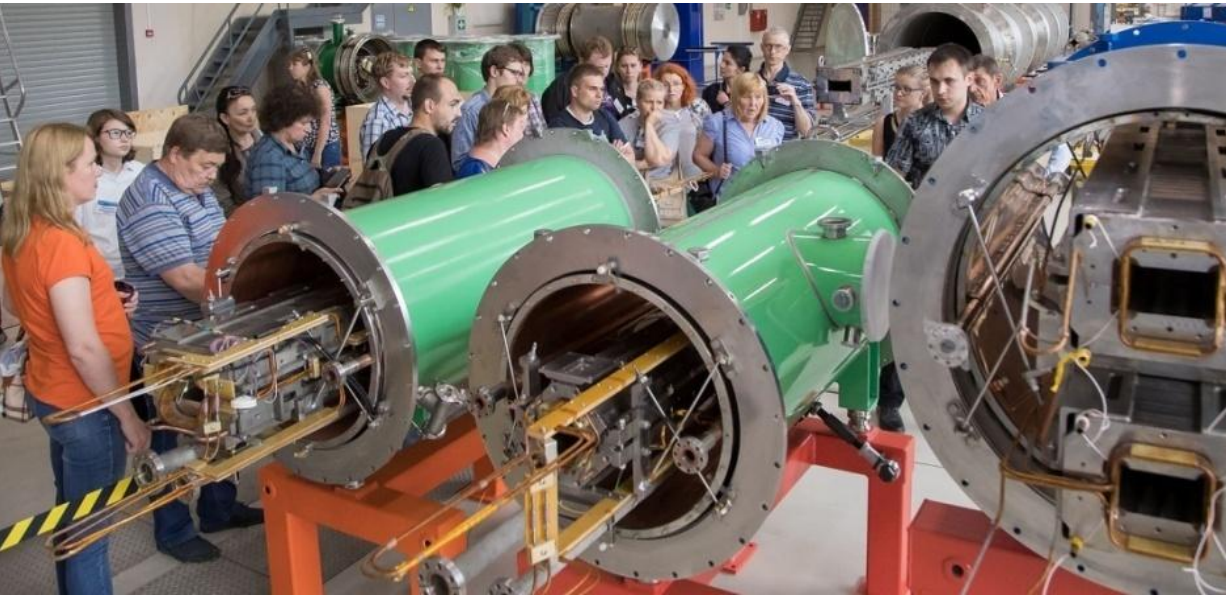
- Visits to experimental facilities
- Lectures
- Hands-on activities
- Meetings with research physicists
- Communication with colleagues

## Goals:

- Raise and maintain the interest of students in modern science
- Motivate students to study science and engineering at universities
- Prepare the future generation of scientists & engineers.
- Show that Science is alive!



# Schools at JINR – July



Bringing  
Science  
closer to  
School

# Schools at CERN – November





# International Student Summer Schools



Organized by JINR

International School on

## Nuclear Methods for Environmental and Life Sciences



Montenegro, Budva, Becici

April 22-28, 2018

### TOPICS:

- Nuclear and related techniques for the environmental studies
- Nuclear medicine: radioisotopes and hadron therapy
- Nuclear detectors in medicine
- Radioecology
- Radiogenetics

### Organizing Committee:

Chairman: Victor Matveev  
Co-Chairmen: Stanislav Pakulyak  
Vadim Bednyakov  
Secretary: Tatyana Donskova

## The 8th International Student Summer School «Nuclear Physics – Science and Applications» (NUCPHYS – SC & APPL)



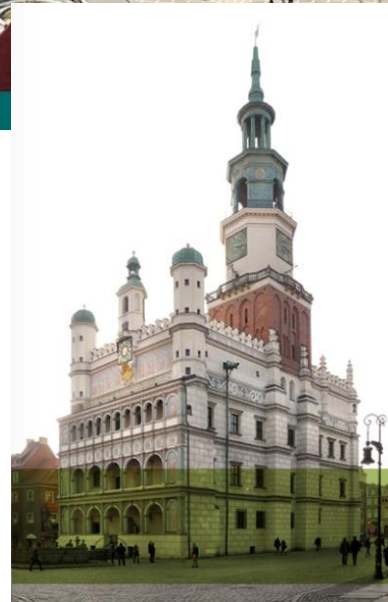
## Seventh International Student Summer School on Nuclear Physics – Science and Applications (NUCPHYS-SC&APPL)



DUBNA



ADAM MICKIEWICZ  
UNIVERSITY  
IN POZNAŃ



Faculty of Physics Adam Mickiewicz University in Poznań  
Poznań, Poland, June 24 – July 4, 2015



**Science brings nations together**

## Group names

1- Husien  
2- Turtur Tudevdorj  
3- Yevich Hanna  
4- Larova Yana

5- El Moataz Bellah Ahmed  
6- Mohamed Fouad  
7- Mostafa Mousa  
8- Amir Mohamed



Science brings nations together

A winter scene featuring a snow-covered path leading towards a white domed structure. The trees are bare and covered in snow, and the sky is clear blue. The path is lined with streetlights and more trees on the right side.

**THANK YOU**  
for your attention