Educational Programs of the JINR University Center

UC Director

Pakuliak S.Z.

BRAZIL-JINR FORUM

“Frontiers in Nuclear, Elementary Particle, and Condensed Matter Physics ”

June 19, 2015
Brief history of JINR Educational Programs

- 1956 – JINR is established
- 1961 – Moscow State University branch is organized in Dubna (D.I.Blokhintsev, V.I. Veksler and S.N.Vernov)
- 1991 – JINR University Centre is established
- 1995 – JINR’s PhD program is opened
- 1994 – Dubna International University (DIU) is founded
- 2003 – education program in physics is started at DIU
- 2004 – International Summer Practices are started
- 2014 – Summer Students Program at JINR is started
Main directions of the UC activity

✧ Students at JINR
✧ JINR PhD Studies
✧ International practices and schools
✧ Outreach activity (school teachers at JINR)

New Development

✧ Start of the Summer student program at JINR in 2014
✧ Realization of the project “Development of modern education programmes”
✧ Creation of the infrastructure to train engineer-physicists
JINR-based departments

**Moscow State University**
- Elementary Particle Physics
- Neutron Diffraction Studies

**Moscow Institute of Physics and Technology**
- Fundamental and Applied Problems of Micro-world Physics

**Moscow Engineering Physics Institute**
- Experimental methods of nuclear physics

**Dubna International University**
- Nuclear Physics
- Theoretical Physics
- Biophysics
- Distributed Computing Systems
- Nanotechnologies and New Materials
- Personal Electronics
- Electronics for Physics Research Installations
## JINR Students statistics of last years

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<th>Universities</th>
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<th>14/15</th>
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<td>Dubna IU</td>
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<td>Other Universities</td>
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<td>108</td>
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<td><strong>451</strong></td>
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## Distribution of students over JINR Laboratories

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<th>FLNR</th>
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TRAINING PROGRAMS

- Lecture courses at JINR-based departments
- Training on the modern physical installations
- HEP data analysis and engineering training programs

LECTURE COURSES

- particle physics and quantum field theory – 24
- mathematical and statistical physics – 7
- condensed matter, physics of nanostructures and neutron physics – 16
- informational technologies – 8
- nuclear physics – 19
- physical equipments – 7
Training course in CATIA-GDML Geometry Builder

This training was organized in collaboration with Research Center FAIR-Russia of the Facility for Antiproton and Ion Research in Europe GmbH
Provision of training postgraduate students from the Member States

• according to new Law on Education in RF PhD studies becomes third level of the higher education system

• for PhD students from JINR Member States we propose the system of dual postgraduate studies
International Student Practice (ISP) at JINR
Research-Educational Projects at ISP

Frank Laboratory of Neutron Physics (FLNP)

M.L. Graus, M. Comoi
Transport phenomena and magnetic/crystalline structure of manganites

N.V. Bachzhina
Non-destructive analysis of element and isotope composition by neutron spectroscopy methods

M.V. Frantasevich
Neutron Activation Analysis for Life Sciences

T.I. Ivarkina
Comparative quantitative analysis of quartz textures in monomineral and multilayer rocks using neutron diffraction at IBR-2.
Joint Institute for Nuclear Research Dubna (Russia)

A. Kozhev
Ion Beam Analysis

A.I. Kulbin
Determination of nanoparticles structure parameters using small angle neutron scattering

A.I. Kulbin
Small angle neutron scattering (SANS) team

V. Nikitenko
Studying nanostructure magnetism with the use of polarized neutron reflectometry

Veksler and Baldin Laboratory of High Energy Physics (VBLHEP)

E. Kokouline, V. Nikitin
Puzzles of multiplicity

E. Kokouline, V. Nikitin
Soft photons at U-70 and Nuclotron

P. Zarubin
The BECQUEREL Project for Juniors

Florov Laboratory of Nuclear Reactions (FLNR)

A. Artuykh
Study of the transfer and fragmentation reactions near Fermi energy. Production of exotic nuclei beams

O. Orelovchevik
Scanning electron microscopy methods in study of micro objects
International Student Practice (ISP) at JINR in 2014

May 18 – June 8: Arabic Republic of Egypt (24 participants)
July 06 - 27: Czech Republic, Poland, Bulgaria, Slovak Republic, Romania (70 participants)
September 8 – 24: South Africa, Belorussia, Serbia (45 participants)
## Statistics of 1st (May-June), 2nd (July) and 3rd (September) stages

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32 → 24+70+45=139

136+686+273=1095
Egyptian Ministry of Science opened the Practice in 2013
Purpose and Implementation of the Program

Program Purpose

The main purpose of the Summer Student Program at JINR is to attract graduate students from the JINR Member States 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 6 to 8 weeks during the period from June to September of each calendar year.

Program Participants

Participants of the Program may be students finishing third (penultimate) year of bachelor studies, master students or PhD students enrolled in the first year of graduate school, studying at universities and research organizations of the JINR Member States.

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**.
Summer Student Program 2014

In 2014 we got 30 applications from 9 JINR Member States. 8 students were selected. Their reports are available at the program website.

In 2015 we got 127 applications and 34 students from 11 Member States were selected.
### Participants lists

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<thead>
<tr>
<th>Photo</th>
<th>Name / Nationality / University</th>
<th>Supervisor</th>
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<td>Gaga Shamii Shetekauri&lt;br&gt;Georgia&lt;br&gt;Tbilisi State University</td>
<td>Marina&lt;br&gt;Vladimirova&lt;br&gt;Frontasyeva</td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Photo" /></td>
<td>Кирилл Вилениннович Локтев&lt;br&gt;Russia&lt;br&gt;Объединный институт атомной энергетики ИАТЭ НИЯУ МИФИ</td>
<td>Максим&lt;br&gt;Викторович&lt;br&gt;Булавин</td>
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<td><img src="image3.jpg" alt="Photo" /></td>
<td>Ibrahim Mohamed Hany Ahmed&lt;br&gt;Egypt&lt;br&gt;Nuclear &amp; Radiation Engineering Department, Faculty of Engineering, Alexandria University</td>
<td>Georgy&lt;br&gt;Aleksandrovich&lt;br&gt;Chelkov</td>
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<tr>
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<td>Тигран Рафаэлович Мурадян&lt;br&gt;Armenia&lt;br&gt;Ереванский государственный университет архитектуры и строительства</td>
<td>Анатолий&lt;br&gt;Олегович&lt;br&gt;Сидорян</td>
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<td>Анастасия Олеговна Мазелья&lt;br&gt;Russia&lt;br&gt;Федеральное государственное бюджетное образовательное учреждение высшего профессионального образования «Санкт-Петербургский государственный университет»</td>
<td>Vyacheslav&lt;br&gt;Mikhailovich&lt;br&gt;Golovatyuk</td>
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<tr>
<td><img src="image6.jpg" alt="Photo" /></td>
<td>Christiaan Petrus Brits&lt;br&gt;Republic of South Africa&lt;br&gt;Stellenbosch University</td>
<td>Vyacheslav&lt;br&gt;Mikhailovich&lt;br&gt;Golovatyuk</td>
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<tr>
<td><img src="image7.jpg" alt="Photo" /></td>
<td>Сергей Васильевич Фёдоров&lt;br&gt;Russia&lt;br&gt;Омский Государственный Университет им. Ф. М. Достоевского</td>
<td>Alexander&lt;br&gt;Vladimirovich&lt;br&gt;Karpov</td>
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</table>
International summer schools

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

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

http://7nucphys-2015.home.amu.edu.pl/
Teacher Programs

http://teachers.jinr.ru/

* First school held in 2009
* Seven schools at CERN (260 part.)
* Five schools at JINR (210 part.)

* More than 25 videoconferences between CERN-JINR and schools
* Increasing of motivated students
Virtual excursions to JINR Labs
Project «Development of modern educational programs»

The goal of the project is to include current scientific data into the educational process, conduct virtual and online laboratory research based on information and communication technologies using modern scientific equipment and data obtained from the existing physical facilities.

Project was presented and approved on the 38th session of PAC on CMP and 114th session of JINR Scientific Council.
Virtual Laboratory of Nuclear Fission

The goal of the project is to include current scientific data into the educational process, to conduct virtual and online laboratory research based on information and communication technologies using modern scientific equipment and data obtained from the existing physical facilities.
Virtual Laboratory of Nuclear Fission
Virtual Laboratory of Nuclear Fission
http://newuc.jinr.ru/section.asp?id=553
Infrastructure to train engineer-physicists

- To create training and engineering department at UC
- This department has to develop regular training programs on real "training" facilities
- These programs can be offered to the Member States and can be used in organizing International Student Practices and the Summer Student Program
THANK YOU FOR YOUR ATTENTION