Proposals for cooperation in Educational programs for science and engineering

UC Director
Pakuliak S.Z.

International workshop
“International mega-science projects”
December 4, 2014
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
Mail directions of the UC activity

- Students at JINR
- JINR PhD Programs
- International practices and schools
- Outreach activity (school teachers at JINR)

New Development

- Start of the Summer student program at JINR
- Realization of the project “Development of modern education programmes”
- Creation of the infrastructure to train engineer-physicists
Moscow State University
- Elementary Particle Physics
- Neutron Diffraction Studies

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

Moscow Institute of Radio Engineering, Electronics, and Automatics
- Electronics for Physics Research Installations

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
380 students are educated and trained at JINR laboratories from RF, RK, Moldova, Belorussia and Ukraine.
Statistics of JINR PhD students 2012-2014

Distribution by the JINR Laboratories

Number of PhD students

<table>
<thead>
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<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>14</td>
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<td>19</td>
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<td>8</td>
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<td>10</td>
<td>11</td>
<td>7</td>
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<tr>
<td>FLNR</td>
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</tr>
<tr>
<td>LRB</td>
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</table>

Percentage in 2014

- VBLHEP: 38%
- BLTP: 19%
- DLNP: 5%
- LIT: 8%
- FLNR: 8%
- FLNP: 0%
- LRB: 5%
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
International Student Practice (ISP) at JINR

- Belarus
- Bulgaria
- Arab Republic of Egypt
- Poland
- Romania
- Serbia
- Slovak Republic
- Ukraine
- France
- Czech Republic
- South Africa
RESEARCH-EDUCATIONAL PROJECTS AT ISP
@ http://uc.jinr.ru/

Frank Laboratory of Neutron Physics (FLNP)

M. L. Graus, M. Corni

Transport phenomena and magnetic/crystalline structure of manganites

N. V. Bachazhina

Non-destructive analysis of element and isotope composition by neutron spectroscopy methods

M. V. Frontasieva

Neutron Activation Analysis for Life Sciences

I. I. Ivarkina

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

A. Kozhev

Ion Beam Analysis

A. I. Kulin

Determination of nanoparticles structure parameters using small angle neutron scattering

A. I. Kulin

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. Kokouina, V. Nikitin

Puzzles of multiplicity

E. Kokouina, V. Nikitin

Soft photons at U-70 and Nuclotron

P. Zarubin

The Becquerel Project for Juniors

Flerov Laboratory of Nuclear Reactions (FLNR)

A. Artyukh

Study of the transfer and fragmentation reactions near Fermi energy - Production of exotic nuclei beams

O. Grekovitch

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, Poland, Bulgaria, Slovak Republic, Romania (69 participants)
September 8 – 24: South Africa, Belorussia, Serbia (47 participants)
Teacher Programs

http://teachers.jinr.ru/

- First school held in 2009
- Six schools at CERN (236 part.)
- Five schools at JINR (210 part.)

- More than 25 videoconferences between CERN-JINR and schools
- Increasing of motivated students
Video-lectures at web-portal

http://teachers.jinr.ru

Lecture by Dmitri Gorbunov, «Cosmology – secret of dark matter» was downloaded 1655 times
Virtual excursions to JINR Labs
New Directions of the UC Activity
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**.
In 2014 we got 30 applications from 9 JINR Member States. 8 students were selected. Their reports are available at the program website.
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
http://newuc.jinr.ru/section.asp?id=553&reset=all
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
Training course on CATIA-GDML Geometry Builder

This training was organized in October 2014 for engineers and physicists from Laboratory of High Energy Physics and Laboratory of Nuclear Reactions.
THANK YOU FOR YOUR ATTENTION