



JOINT INSTITUTE FOR NUCLEAR RESEARCH

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JINR UNIVERSITY CENTRE IN 2003–2009

Report to the 107th Session
of the JINR Scientific Council
February 18–19, 2010

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Объединенный институт
ядерных исследований
БИБЛИОТЕКА

JINR University Center 2003-2009

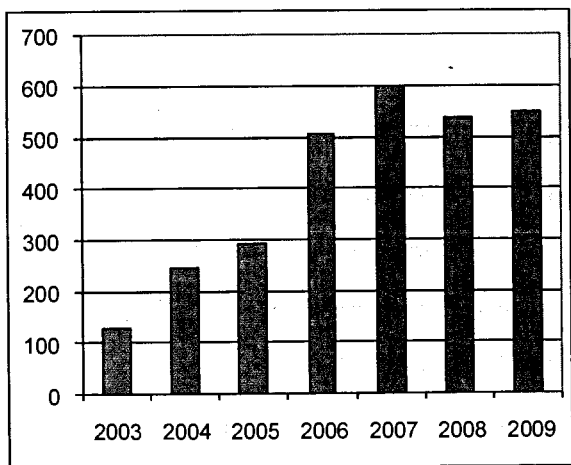
JINR University Center coordinates and supports the JINR educational program. 28th session of PAC on nuclear physics and physics of the condensed matter, 30th session of PAC on particle physics and 104th session of JINR scientific Council highly estimated the efforts of UC on realization of the first priority theme 06-0-1026-1998/2008 “Organization, support and development of the educational process of university type in JINR”. This theme was recommended for prolongation to the next 5 years. The new theme of first priority 06-0-1078-2009/2013 “Organization, support and development of the educational process in JINR” was included in the topical plan of the Institute for 2009 and the tasks formulated in this theme laid in the base of the UC proposals for the seven-years plan of JINR development on 2010-2016, accepted to realization on the meeting of JINR CP in Astana in November 2009.

The goal of the JINR educational program is developing and proper functioning of the system of training of young scientists for the JINR member-states and the Institute itself on the specialties connected with the JINR research directions. This program is realized on the base of the University Center.

JINR is the base for training physicists from many well known educational institutes of Russian Federation. This training includes the specializations in the nuclear physics, physics of the elementary

particles, condensed matter physics, theoretical physics, technical physics and radiobiology.

Each year the students from many institutes and universities of JINR member states are studying on the base of the Institute. The number of students has grown over the last 7 years from 100 to over 500 per year. The yearly growth of the number of students passing the training on the base of JINR University Center is shown on the diagram.



424 students from the JINR-based departments of MPhTI, MSU, MIREA, Dubna International University (DIU) studied in 2009 at the University Center. There were also 146 students from the different universities of JINR member states: MEPhI, MEI, State universities of Belgorod, Voronezh, Gomel, Erevan, Kazan, Kostroma, Saratov, S.-Petersburg, Irkutsk, Minsk, Tver, Tomsk, Tula, Uzhgorod, the Pomorsk, Ural, South-Ural state universities, the

Siberian FU, the national universities of Kiev, Uzbekistan, the university of the Moldova Academy of Sciences.

The students from the Dubna educational institutes started to dominate by their number from 2008 (around 80%). After opening of the JINR-based departments in the Dubna International University there happened an important qualitative change in the educational program of the Institute: JINR began to prepare scientific personnel by its own forces starting from the moment when young people enter a university. This allows the Institute to influence on the educational process, tuning it to proper tasks, and the Institute staff members to combine the scientific and educational activity (in 2009 there were 90 JINR staff members among the lecturers of the JINR base departments of Russian universities). In 2009 first students graduated from the departments of theoretical and nuclear physics of DIU and entered the PhD-program of the UC.

This does not mean that UC began to pay less attention to the students from other educational institutes of JINR member states. The opposite is fair: there increased both the number of students from these institutes (approximately in 5 times), and the number of Institutes which signed the contracts with UC (now there are 21 such educational Institutes in Russia and 16 Institutes in other member states).

From 2009 on the web site of UC in the section "Students" there was placed the list of bachelor and magister work themes for

students, offered by the scientific staff of a number of the Institute laboratories. Also, there was refreshed the content of the database of educational courses in the following sections: particle physics and quantum field theory – 34 courses; mathematical and statistical physics – 19; condensed matter, physics of nanostructures and neutron physics – 21; nuclear physics – 15, physical equipment – 18, informational technologies – 15 courses (Russian and English versions). The existing system of individual studying plans allows one to include into the process of studying new courses which are necessary for specialization of the students and, importantly, which are connected with the directions of JINR scientific researches.

UC is realizing also the targeted training of students from member-states in the framework of the system of postgraduate studies. The training is going on for 10 specialties (computational mathematics, devices and methods of the experimental physics; theoretical physics; physics of the condensed matter; physics of nuclei and elementary particles; physics of beams of charged particles and accelerating techniques; high energy physics; radiobiology; mathematical and software support of computers, complexes and computer nets; mathematical modeling, numerical methods and complexes of programs), in the framework of the license of Federal agency on supervision in the sphere of education and science.

Each year about 70 people are educated at the JINR postgraduate courses. Scientific supervision of the postgraduate

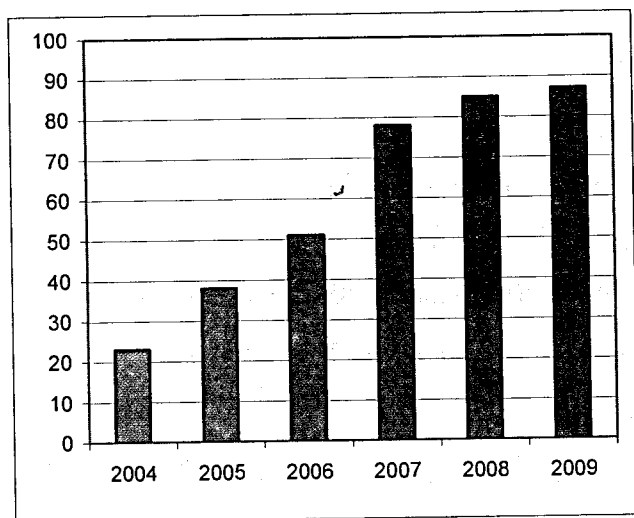
students is realized by the leading staff members of the institute having, as a rule, the scientific degree of the Doctor of Sciences. Among 198 postgraduate students, who finished the postgraduate studies from 1998, 53 people defended the Candidate's theses.

Training of the postgraduate students on the history and philosophy of science is led by the lecturers of the philosophy department for natural sciences faculties of the MSU philosophy department. For postgraduate and undergraduate students, there were organized also the lessons of English language.

The international summer practices were organized starting from 2004 by the initiative of UC, MEPhi, MPhTI, Polish educational institutes and the Czech technical university. The practices are destined for students of the higher grades from JINR member-states and countries which signed an agreement with JINR at the government level. Due to the large number of requests for participation, from 2007 practices are taking place in several stages. Among the participants there are representatives from Belarus, Bulgaria, Egypt, Poland, Romania, Russian Federation, Slovakia, Czech Republic, South African Republic, Arab Republic of Egypt.

The program of practice includes the work on small (duration of three weeks) scientific educational projects in laboratories of the Institute, reports-presentations of the students on the work done, lectures of the leading scientists and specialists on the JINR laboratories activities, and also excursions and cultural activities. The

growth of the number of participants over six years is shown on the diagram.



On the web site of UC there is a database of scientific-research projects updated each year (LTP – 1, LNP – 5, PLNP – 11, LHEP – 2, LNR – 7, LIT – 1, LRB – 1 project).

Starting from 2001 UC with the support of the Czech technical university and “Bogoliubov-Infeld” program organizes international summer schools “Nuclear methods and accelerators in biology and medicine”. First and third schools were organized in Dubna, second – in Poznan (Poland), fourth – in Prague (Czech Republic), fifth – in Bratislava (Slovakia). The program of Schools included lectures in the following directions: nuclear physics and environment, accelerators of the charged particles, radiational therapy, radiation detectors,

visualization of the bio-medical data, radiational biology, modern trends in biology and physics.

For the students the obligatory condition of participation in the School is the presentation of an oral talk or a poster. 17 students from Russian Federation, 21 from Czech Republic, 24 from Poland, 10 from Slovakia, 6 from South Africa and 2 students from Bulgaria took part in the work of the last, Fifth School due to the financial support of the JINR Directorate.

UC organizes special educational. In 2008 and 2009 the courses “Radiational protection and nuclear safety” were taken by Polish students from M. Sklodovsky-Curie university (Lublin), who has chosen the specialty connected with securing the nuclear safety.

Another direction of the UC activity is the organization of acquaintance visits for students, postgraduates, schoolchildren and school teachers from JINR member-states which become possible due to the financial support from the plenipotentiary grants and the “Bogoliubov-Infeld” program. In 2009 as the guests of UC there were schoolchildren from Germany and Poland, students from Poland and Sweden, and 2 school teachers from Bulgaria have acquainted with the UC experience of work with schoolchildren.

An scientific school for young teachers of physics was organized by the UC at CERN in November 2009 in collaboration with European Organization for Nuclear Research. The financial support was rendered by the Federal agency on science and

innovations in the framework of the Federal target program "Scientific and scientific-pedagogical personnel of the innovational Russia" for 2009-2013.

46 teachers of physics from different general education establishments of Russian Federation took part in the work of school. Leading scientists-physicists of Russia working at CERN (including also the representatives of JINR) read the lectures on modern achievements in the field of particle physics, cosmology, accelerating techniques, informational and nanotechnologies. The school program included also the attendance of experimental facilities in CERN, meetings with physicists at their workplace and in an informal atmosphere.

During the academic year the physics lessons are taking place at the UC for Dubna schoolchildren of higher grades, which include lectures helping to prepare for entrance examinations to physical departments of Russian institutes, and also lessons in the school physical laboratory. In 2009 in two groups there studied 40 schoolchildren. The school physical practicum is functioning in UC starting from 2003.

UC and the Dubna International University are the organizers of summer conferences for schoolchildren. The first two conferences for schoolchildren took place in April, 2005 and 2006. More than 50 schoolchildren of higher grades from Russia, Belorussia and Ukraine participated in the conference. The conferences included the

Olympiads in physics and mathematics and excursions to the JINR laboratories.

In July 2007 and 2008 the UC have been an organizer of the summer schools "Moder physics 2007 and 2008". Schoolchildren of 8-10th grades from the physics-mathematical schools of Moscow and the Moscow region, Saint-Petersburg, Ekaterinburg, Stavropol took part in these schools. The school program included holding of the Olimpiads, solution of theoretical and experimental problems, physics contests, popular lectures of leading scientists on modern scientific problems (from physics of the microworld and cosmology to new scientific and technological tasks), excursions to the JINR laboratories, meetings with scientists and artists, sports program. The schools were sponsored by the Charitable Foundations AFK "System" and "Dynasty".

In 2006 in the University center there appeared a new structure – the JINR UC educational laboratories. The laboratory complex at present includes 4 laboratories: the laboratory of physical optics, the laboratory of molecular physics and thermodynamics, the laboratories of atomic physics and nuclear physics. It is planned that the educational laboratory complex will be developed, supported and used jointly with those institutes, whose students are taught on the JINR-based departments. Presently in the educational laboratories of JINR UC there are lessons for students of the Faculty of natural and

engineering sciences of DIU and students of the department of electronics of physical devices of the MIREA branch in Dubna.

There are eight lecture audiences in UC now, three of which are equipped by electronic projectors to give presentations and one room is equipped by technique for the video-conferences. Additionally there are two computer classes. One more equipped audience and the computer class are located in the complex of JINR UC educational laboratories.

One of the directions of the activity of the University Center is the licensed training and raising of qualifications of the workers, engineers and staff members.

Training of young scientists and specialists of the Institute at the courses of the English language is continued. In 2009, 42 staff members of the Institute took these courses.

From the moment of its foundation, UC publishes its own methodical and educational manuals. In 2009, there were published 7 educational manuals, their total amount is 41.