UNIVERSITY CENTRE

The results of the JINR Education Programme were discussed at the University Centre (the UC) Council session held on December 13, 2006. It was pointed out by the JINR Director Prof. A. N. Sissakian that the UC successfully fulfilled its duties in 2006 regarding organizing, running, and supporting the education process at JINR. In addition to the UC's traditional activities (graduate and postgraduate studies, international actions, and work with secondary school pupils), a new task was started in 2006: the establishment of the UC's student laboratories.

Student Laboratories — a New Structure within the UC

In 2006, a new structure emerged within the UC: the student laboratories. An important contribution to the acquisition of equipment was made by Dubna University.

The UC laboratories will first be used for the students of the JINR-based Departments performing the general physics practicum exercises. In the future, special practicum equipment is planned to be installed there, which will be interesting to graduate students of the JINR Member States.

By 2007, the laboratories of thermodynamics and molecular physics, optics, and atomic physics have been equipped; a nuclear physics laboratory has been founded.

International Cooperation and the Summer Student Practice

The key mission of the JINR Education Programme and the UC's activities is to attract the youth of the JINR Member States to the Institute. With this aim, short-term actions are carried out for the youth of the Member States that help them to know JINR better and, possibly, to find their prospective scientific supervisors at JINR.

The UC organizes international student schools and practices, as well as acquaintance visits for secondary school pupils, students, and postgraduates of Member States. The visit programmes include excursions to the JINR Laboratories, seeing the Institute's basic research facilities, studies at the laboratories, and performing the physics practicum exercises.

On July 2–22, 2006, the UC hosted the Third International Summer Student Practice in JINR Fields of Research. It was remarkable for a record high number of its participants: 51 students came from higher education institutions of the Czech Republic, Poland, Romania, and Slovakia. There were more applications for attending the practice than planned; so the organizers had to select the participants. This points to the growing publicity of this Practice. The largest group — 20 students — was the Polish one; it was made up by students of the universities of Gdansk, Krakow, Lodz, Lublin, Poznan, Szczecin, and Wroclaw. The second largest group came from the Czech Republic (14 students). The number of the Romanian and Slovak participants has also grown (nine and eight, respectively).

The Practice programme included lectures on special subjects by JINR's leading scientists, lecture presentations of the JINR Laboratories; and traditional exercises at the basic research facilities of the Flerov Laboratory of Nuclear Reactions (FLNR), Frank Laboratory of Neutron Physics (FLNP), Veksler and Baldin Laboratory of High Energies (VBLHE), Dzhelepov Laboratory of Nuclear Problems (DLNP), and Laboratory of Radiation Biology (LRB).

For the first time the lecture programme of the Practice included the presentations of the JINR Laboratories.

The topics of the laboratory exercises — the key part of the Practice — were announced in advance; therefore, when registering at the UC Internet site for participating in the Practice, the applicants, besides specifying their scientific interests in general, chose laboratory exercises from the list published at the site. The exercises were provided by FLNR, FLNP, VBLHE,

DLNP, and LRB. The widest range of topics was provided by FLNR and FLNP. For example, six exercises were arranged at FLNR's facilities, including «Studying Nuclei at the Stability Border», «Studying Micro-Objects Using an Electronic Microscope», and «Studying Radiation Properties of Materials». FLNP organized ten laboratory exercises reflecting all the main fields of its research (nuclear physics, condensed matter physics, and neutron activation analysis). Students of JINR Member States show great interest in laboratory work on applying nuclear methods in biology and medicine. Therefore, LRB was involved in 2006 in the Practice; the Laboratory provided the following exercises: «Instrumental Methods of Radiation Safety», «Cytology», «Microbiology», and «Molecular Biology».

The Practice became possible thanks to the financial support by the grants from the Plenipotentiaries of the Czech Republic, Poland, and Slovakia, and to the programme of cooperation between JINR and Romania. Remarkably, great help was given by W. Chmielowski (Poland), A. Constantinescu (Romania), A.-S. Dubnickova (Slovakia), and I. Stekl (the Czech Republic).

JINR Graduate Studies

On the basis of JINR, graduate programmes in physics reflecting the main fields of the Institute's research (nuclear physics, elementary particle physics, and condensed matter physics) are offered. The programmes begin either with the first year of studies (for the students of the Dubna branch of Moscow Institute of Radio Engineering, Electronics, and Automatics (MIREEA); and the departments of Dubna International University of Nature, Society, and Man) or with the graduate years (for physics students coming from Moscow State University (MSU), Moscow Engineering Physics Institute (MEPI), Moscow Institute of Physics and Technology (MIPT), and higher education institutions of JINR Member States).

In 2006, more that 500 students attended courses at the JINR Laboratories, including 34 students of MSU, nine of MEPI, 15 of MIPT, more than 200 students of Dubna University, and 120 of other higher education institutions of the following JINR Member States: Armenia, Belarus, the Czech Republic, Poland, Ukraine, and Uzbekistan.

One of the UC's functions is creating and supporting additional special advanced courses for graduate students delivered by JINR staff members. The program of the courses is based upon the recommendations and requests of the JINR-based departments of higher education institutions. The following courses were given at the UC in 2006: Telecommunications and World Information Resources (V. V. Korenkov); Database Management Systems (V. V. Korenkov); Database Management Systems (practice, I. A. Filozova); Statistical Physics (G. G. Adamian); Selected Topics of the Elementary Particle Physics (seminar, Ye. A. Strokovsky); Elementary Particle Physics Methodology (Ye. A. Strokovsky); Computer Modelling of Physics Processes in Detectors Using the GEANT4 Software Package (A. S. Zhemchugov, A. Demichev); C++ (V. G. Olshevsky); Introduction to the Object-Oriented Analysis of Data Using the ROOT Software Package (T. M. Solovyova); Introduction to the Theory of Accelerators (G. V. Trubnikov).

Besides offering lectures on certain subjects, the UC participates in working out the education programmes in specific disciplines comprising lecture courses and seminar classes and supports them. In 2006, the Large Hadron Collider (LHC) special programme continued at the UC. The programme was initiated by Prof. I. A. Golutvin to train staff for the LHC experiments in which JINR participates. The programme was attended by students of MSU, MIPT, Voronezh University, Kostroma University, and MIREEA.

JINR Postgraduate Studies

In 2006, the UC did a great job of preparing the documents for the prolongation of its license to offer postgraduate programmes. JINR offers postgraduate programmes in ten specialties.

In 2006, JINR's total postgraduate enrolment was 67. Table 1 shows the distribution of the postgraduates over the JINR Laboratories in 2006.

Table 1

Laboratory	Number of postgraduates
Laboratory of Theoretical Physics	20
Laboratory of Nuclear Problems	21
Laboratory of Nuclear Reactions	5
Laboratory of High Energies	6
Laboratory of Neutron Physics	4
Laboratory of Particle Physics	1
University Centre	1
Laboratory of Information Technologies	7
Laboratory of Radiation Biology	2
Total	67

Table 2 shows the total enrolment distribution over all JINR's postgraduate specialties in 2006.

In 2006, 18 applicants were accepted in the postgraduate studies.

It is certainly interesting to examine from which higher education institutions postgraduates came to JINR. About half of those accepted graduated from Moscow's elite institutions (four came from MSU and four from MIPT); others graduated from institutions of JINR Member States (mostly from Russian ones). In 2006, JINR's total postgraduate enrolment from its Member States was 16, including seven from Armenia,

five from Belarus, three from Ukraine, and one from Uzbekistan.

Table 2

Specialty	Number of postgraduates
Nuclear and Elementary Particle Physics (01.04.16)	26
Theoretical Physics (01.04.02)	19
Charged Particle Beam Physics and Accelerator Techniques (01.04.20)	3
Solid State Physics (01.04.07)	3
Physics Experiment Techniques, Instrument Physics, and Physics Research Automation (01.04.01)	5
Mathematical and Software Support of Computers, Computational Complexes, and Networks (05.13.11)	1
Mathematical Modelling, Numerical Methods, and Software Complexes (05.13.18)	7
High Energy Physics (01.04.23)	—
Radiobiology (03.00.01)	3

Pre-University Studies

In the modern world the formation of a prospective physicist actually begins before the person enters a university. Besides, the choice of a career by a secondary school pupil depends on his or her mental outlook and interests. Therefore, the UC attaches great importance to its activity aimed at secondary school pupils of JINR Member States to raise their interest in physics and research carried out at JINR.

In 2006, the UC was visited by eight secondary school pupils and their two teachers from Poland (the cities of Leszno, Poznan, Swinoujscie, and Tarnowskie Gory), ten students of Opole University (Poland), and 15 school pupils from Berlin.

Throughout 2006, the UC was offering an optional physics course for the 10th and 11th-year school pupils of Dubna, which included lectures and laboratory work.

In March 2006, the UC and Dubna University held together an Open Scientific Conference on Physics and Mathematics for Moscow Region's School Pupils. The conference was attended by more than 50 secondary school pupils of Russia, Ukraine, and Belarus.

Staff Training and Retraining and Qualification Improvement

In 2006, the UC continued the training, retraining, and improvement of the qualifications of its working staff and specialists. JINR's ten staff were trained in an allied profession; ten, in a second profession.

At the JINR courses training personnel for operating facilities that are within the jurisdiction of the Federal Technical Inspection 60 JINR's staff were trained; 86 JINR's staff were trained and certified to operate and maintain machines, mechanisms, and pressurized vessels.

Fifty JINR's management staff and leading specialists were trained and certified according to the standards and regulations on using atomic energy. JINR's seven staff improved their qualifications at different seminars held by education institutions of Moscow, Obninsk, and Dubna.

Information Support of the UC's Activities

In January 2007, the UC opens its new Internet site. It will meet the requirements to modern sites and is designed so as to let the UC's potential partners in the JINR Member States learn about the JINR education programmes and the UC's activities.