Implementation of the Recommendations of the Scientific Council's 95th and 96th Sessions. Progress of implementation of "The Programme of JINR's Scientific Research and Development for 2003–2009".

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Contents

1 Introduction

Dear Members of the Scientific Council,

Honorary guests,

Colleagues,

Ladies and Gentlemen:

On behalf of the JINR Directorate, I would like to inform you about implementation of the recommendations of the Scientific Council's 95th and 96th sessions.

The year 2004 was the second year of the period related to the 7-year Programme of the JINR's Scientific Research and Development. The Institute's Directorate and personnel are making efforts for implementing the Programme. I will inform you about the progress in this area.

1.1 Documents

You know the documents of the two previous sessions of the Scientific Council, and it is not necessary to remind you about the Council's recommendations. All the materials of the sessions and the reports presented are available on the Web-site of the Joint Institute for Nuclear Research.

1.1.1 The JINR Scientific Programme in 2005

Documents concerning scientific programme are presented in the "Topical Plan for JINR Research" (Russian and English versions).

You can see the data on the research themes in the table in the next slide.

Table: Data on the research themes

Field of activity	Number of research themes
Theoretical physics	5
Elementary particle physics	26
Relativistic nuclear physics	11
Heavy-ion physics	3
Low- and intermediate-energy physics	3
Nuclear physics with neutrons	2
Condensed matter physics	5
Radiation and radiobiological research	2
Networking, computing, computational physics	3
Educational programme	1
Total:	61

The scientific programme of 2005 includes 61 research themes, which is the same figure as in 2004. In accordance with PAC recommendations, the JINR Directorate opened 1 new theme at the Laboratory of Information Technologies and closed 1 theme at the same Laboratory. I believe the PAC Chairpersons will comment more about the research programme of 2005.

1.1.2 Funds in 2004

At the 95th session of the Scientific Council we were requested to present the general figures of the Institute's budget. I am pleased to inform you that the 2004 budget was the best one for the volume of contributions from the Member States: 93% of budgetary contributions were received.

Taking this opportunity, I would like to express my sincere thanks to Mr Valery Galchenko, Member of of the Russian State Duma, for his constant attention to the needs of JINR, in particular for his personal assistance in stabilizing the financial support given to the Institute by the Russian Federation.

Nevertheless, the requests for funding projects do not coincide with the possibilities of the Institute budget. In my opinion it is impossible to solve the problem of the full implementation of the research programme without radical changes in the management at JINR.

At the 96th session of the Scientific Council in June 2004, the PACs were requested to set scientific priorities for the research projects in the context of limited resources in the JINR budget. This request was discussed at the PAC meetings in November 2004. Taking into account the financial situation at JINR, the PACs concurred with the Institute Directorate that first-priority status should be set for research activities for one year only, pending a future review of the whole of the Institute activities.

Let me stress that renewed priority list should be formed also in the context of the personnel policy.

During the last 12 years the number of employed personnel has decreased. In the same period the number of invited scientists as well as high-quality scientists (with Dr and PhD degrees) has increased. However, the average age of JINR researchers now exceeds 50 years. Analysis of the employees' age data shows that there are over 34% people of pension age among them. 24% of the Institute personnel are employees at the age under 40. The last figure is arising optimism!

Our general duty is to provide the acceptable living standards for pensioners and to use their wide practical experience for educating and training young specialists. During the last 12 years, considerable efforts were made on this way in the JINR University Centre as well as in the Laboratories. Today our task is to transfer the positions from pensioners to those younger specialists who are able effectively to implement the research programme and to develop our international centre.

After my report, Professor A. Sissakian will present more information on the financial conditions for implementation of the JINR research programme as well as proposals on the staff recruitment and staff transfer.

I finish here the introductory remarks and will switch to the main subject of my report dedicated to the scientific highlights of 2004 and priority activities in 2005. Speaking about scientific achievements, I will demonstrate the results of investigations that were recommended for awarding JINR prizes in 2004 by the scientific councils of the Institute Laboratories.

2 Highlights of 2004 and Priority Activities in 2005

2.1 Scientific Progress Reports

You have in your papers the latest issue of the "JINR News" journal, where you can find information about the current activities of the Joint Institute, and 10 preprints of the JINR Laboratories and Departments concerning scientific results of the last year and information on the future plans. I believe you will have time to read all these documents.

2.2 Laureates of International Prises

Let me draw your attention to the photo on the cover of the "JINR News". It is the Low Energy Particle Toroidal Accumulator (LEPTA) where the successful first circulation of an electron beam was obtained on 10th of September 2004.

Professor Igor Meshkov is the leader of the team which designed and constructed the LEPTA. It gives me great pleasure to inform you that the 2004 prize of the European Physical Society Accelerator Group was awarded to Professor I. Meshkov for outstanding work, for many decades, in the accelerator field, "for his seminal contributions to numerous advances in accelerator science over the past 40 years and in particular for his development and implementation of the techniques which allowed the original brilliant idea of electron cooling to become a hardware reality and an accelerator tool. Also, for his devotion to and promotion of international collaboration in accelerator physics."

I would also like to inform you that the 2004 Humboldt Research Award has been granted to Professor Rostislav Jolos, Head of Sector of the Bogoliubov Laboratory of Theoretical Physics, in recognition of his outstanding achievements in research and teaching, as well as of his contribution to the promotion of scientific cooperation between research institutions in Germany and JINR.

On 23 November 2004 the Presidium of the Russian Academy of Sciences conferred a Gold Medal in memory of Academician N.N. Bogoliubov for the year of 2004 upon Academician Dmitri Shirkov, Honorary Director of the Bogoliubov Laboratory of Theoretical Physics for his outstanding activities in mathematics and theoretical physics.

I am taking this opportunity, in this audience, to heartily congratulate Professors I. Meshkov, R. Jolos and D. Shirkov on receiving these well-deserved outstanding prizes.

2.3 Operation of the JINR Facilities in 2004

The next section of the report concerns the operation of the JINR facilities.

The operation of the JINR facilities in 2004

Facility	Data in hours	
	Plan for year	Actual for year
Basic facilities		
Nuclotron	2500	2110
IBR-2	1300	1384
U400	6100	4968
U400M	3500	3156
Users' request facility		
Phasotron	2365	1567

In total last year, all the facilities operated for 13185 hours. You can also see that the actual data are lower than those planned except IBR-2 reactor. The sources of these differences are the emergency conditions at Nuclotron and Phasotron or the delays in installation of renewed elements at U400 – U400M complex in framework of the DRIBs project.

More detailed information about the operation and development of the facilities is available in preprints in your papers, and you can also ask Professor G. Shirkov, the Chief Engineer, if you have any specific questions. Let me draw your attention to some results.

2.4 Nuclotron and Relativistic Nuclear Physics

Construction of the new internal target station at the Nuclotron was completed in 2004. The Prague Vacuum Plant and the Physics Institute of the Slovak Academy of Sciences in Bratislava actively participated in this work.

In accordance with the agreement between JINR and the Indiana University (USA) the polarized ion source will be installed at the Nuclotron. The Institute for Nuclear Research of the Russian Academy of Sciences participates in the construction of this source. At present the source is ready for transportation from the USA to Dubna. Acceleration of deuterons up to the maximum energy of 6 GeV per nucleon and the installation of the polarized ion source for increasing the intensity of deuterons up to 10^{10} per cycle are the main tasks of the Veksler-Baldin Laboratory of High Energies in the next two years.

The experiments are being carried out now at the internal and external beams of the Nuclotron.

The measurements of the excitation function of the pion yield were carried out at the DELTA-2 set-up at the Nuclotron internal proton and deuteron beams with Ag, Cu, Al and C targets during three runs in March, June and December 2004. The layout of the DELTA-2 set-up and preliminary experimental results are presented in the slide. It shows that for heavier targets (beginning with Cu) a narrow peak appears in the region of the beam energy 350 MeV/nucleon. It means that the effect on enhancement in the excitation function of the pion yield in the $p+A$ and $d+A$ reactions at projectile energies near 350 MeV/nucleon has a nuclear nature. For final interpretation, more experimental data are needed. It is planed to study the effect in more detail for various targets, projectiles and pion emission angles in 2005-2006.

2.5 Applied Research: Hadron Therapy

Obtaining in 2004 of the multicharged carbon beam in the specialized beamline with the energy of 500 MeV per nucleon at the Nuclotron gives a new quality for this accelerator, first of all for hadron therapy. This work was done in the context of the Med-Nuclotron project. It is an additional set-up to the medical complex for hadron therapy that is operating successfully at Phasotron where 100 patients underwent a course of proton treatment in 2004.

The Agreement between JINR and the Slovak Office of Standards, Metrology and Testing was signed on 11 December 2004 for coordination of the joint activities in nuclear medicine. Studies and practical work in the field of hadron therapy at the Phasotron and at the proposed new beamline at the Nuclotron are priority tasks of the Veksler-Baldin Laboratory of High Energies and the Dzhelepov Laboratory of Nuclear Problems in 2005.

2.6 Heavy-Ion Physics

The main focus in 2004 at the Flerov Laboratory of Nuclear Reactions was given to the experiments aimed at the physical and chemical studies of superheavy elements in the reaction $^{243}Am+^{48}Ca$. Decays of elements 115 and 113 discovered in 2003 were studied. Let me stress that the rather long lifetime (exceeding 20 hours) of dubnium isotopes obtained in the α-decay chains of new element 115 allowed us to investigate the chemical properties of this element. Tomorrow Professor Sergey Dmitriev will make a detailed report on the chemical identification of *Db* as decay product of element 115 in the reaction $^{48}Ca+^{243}Am$.

In 2005 the experiments on the physical and chemical studies of superheavy elements will be continued, with the MASHA mass separator to be used for mass identification of these elements.

First experiment with the radioactive beam of ^{6}He was carried out at DRIBs. The world-level record for intensity with this beam on the target was achieved. However, the intensity is lower by a factor of 50 in comparison with the design value. The priority tasks of the Flerov Laboratory of Nuclear Reactions in 2005 are continuation of the reconstruction of the U400 accelerator and implementation of work on the realization of the DRIBs project aimed at physics experiments with radioactive ion beams.

I would like to inform you that new scientific results and achievements in the field of heavy-ion physics were discussed at the International Symposium on Exotic Nuclei which was organized by the Flerov Laboratory of Nuclear Reactions (Dubna), RIKEN (Japan), GSI (Germany), GANIL (France) during the first half of July 2004 in Peterhof near St. Petersburg. The Symposium was devoted to the investigation of nuclei in extreme states and, in particular, at the limits of nuclear stability (from very light neutron- and proton-rich up to superheavy nuclei). About 200 physicists from 19 countries participated in this Symposium.

The programmes on the superheavy elements and radioactive beams are implemented within the framework of the activity of the Russian Federation–U.S. Joint Coordination Committee for Research on Fundamental Properties of Matter. The work on the superheavy elements was also performed with the support of grants from the Russian Foundation for Basic Research, the Russian Agency for Atomic Energy (Rosatom) and personally by Academician Alexander Rumyantsev, Director of Rosatom. My special thanks also go to Dr. Oleg Patarakin, Head of Department of Nuclear Science and Technology in Rosatom, for his permanent attention to our needs.

2.7 IBR-2

I would like to note that Rosatom supports the IBR-2 modernization in accordance with the JINR-Rosatom Agreement signed in 2000. The financial support of Rosatom (10 million roubles) for the IBR-2 reactor modernization was contributed timely and in full volume.

I am pleased to inform you that also JINR funded the modernization of IBR-2 in the volume of 348 k$ which exceeds the planned volume. We also continue to compensate the debt accumulated during 2000-2002.

In 2004 one of the main tasks of the Frank Laboratory of Neutron Physics was the installation of the third movable reflector for the IBR-2 reactor. This work was fulfilled according to schedule. IBR-2 began to operate for users on 13 September 2004.

Information about the current experiments at IBR-2 and about the future plans will be presented this afternoon by Professor Victor Aksenov.

Let me draw your attention to the fact that about 140 experiments are implemented at the IBR-2 reactor by physicist from 25 countries every year. German scientists hold the third position in the total number of experiments at IBR-2. Status and plans on joint experiments were discussed at the Germany – JINR Workshop on “Condensed Matter Physics with Neutrons at IBR-2” which was held in Dubna in June 2004.

The Directorate of the Frank Laboratory is doing their utmost to attract new users and to allocate as much beam time as possible in favour of users.

2.8 IREN

For the IREN facility, the installation of a new electron linac in the IREN hall and the assembly of the first section of the linac were continued in 2004. The IREN fuel load was successfully delivered to a specially prepared storage room at the JINR Department of Radioactive and Fissible Materials on 21st of December 2004. The dismantling of the IBR-30 reactor must be completed in 2005. It is a priority work for the JINR Laboratories that participate in the IREN project. The solid new plan of investment for the IREN project must be also prepared by these laboratories in 2005. Then this plan should be discussed at a meeting of the PAC for Nuclear Physics.

I informed you at the previous sessions that there is an intention of the Rosatom and of the Russian Ministry of Education and Science to support the IREN construction. The frames of a funding programme were discussed several times with members of the Directorate of the “Kurchatov Institute”. A common programme in the context of participation of physicists from the “Kurchatov Institute” in experiments at JINR was also a subject of these meetings.

The corresponding document was signed by Academician E. Velikhov, President of the Russian Research Centre “Kurchatov Institute”, and by me in December 2004. This document will help to coordinate the research programmes of the “Kurchatov Institute” based on the use of the JINR facilities.

Vice-Director Alexei Sissakian and Chief Engineer Grigori Shirkov visited the “Kurchatov Institute” one week ago. At the meeting with E. Velikhov and other members of the “Kurchatov Institute” Directorate it was agreed that the “Kurchatov Institute” will invest into IREN construction in 2005. JINR and the “Kurchatov Institute” will request money for IREN from a special fund of the Russian Ministry of Education and Science.

2.9 Information technologies

Concluding the section of my report dedicated to the JINR basic facilities, I wish to inform you that the work to create the JINR GRID segment and to incorporate it into the global GRID structure is being actively implemented. The JINR Gigabit Ethernet Local Area Network (LAN) became available for users in March 2004. This optical cable lay-out allows using 1 Gigabit per second for every Laboratory. Today the JINR LAN database includes 4801 registered elements (it was 4506 in the year 2003).

Further development of JINR's telecommunication links, networking, computing and information infrastructure, including GRID technologies is the priority activity of the JINR Laboratories. It is planned that the JINR - Moscow network channel will be increased up to 1 Gigabit per second in the year 2005.

2.10 Theoretical Physics

Now, I'll tell you about new results in theory that were obtained at the Bogoliubov Laboratory of Theoretical Physics. I would like to emphasise that the theoretical studies are carried out more and more in close cooperation with experimental groups at JINR and participating laboratories. Our theoreticians are participating in frontier experiments aimed at studying the fundamental properties of matter in the context of the JINR long-term research programme as well as the JINR educational programme. Let me demonstrate a good example of such an activity that is very important for experimental groups that are engaged in nuclear physics.

The discovery of the superdeformed states of atomic nuclei stimulated for more than ten years the experimental and theoretical studies of their properties. It was found that very strong gamma-transitions between the superdeformed rotational states come abruptly to the end at some value of the angular momentum. Tremendous experimental efforts have been undertaken to find weak transitions from the superdeformed to the normal deformed states. In the first theoretical investigations of the problem the main characteristics of these transitions have been extracted from data. However, the physical nature of the states was not clarified. It was shown for the first time by BLTP theoreticians that the collective states generated by the cluster motion describe both superdeformed and those normal deformed states to which superdeformed states decay. The band termination phenomenon is explained by the crossing of the superdeformed rotational band and nearest neighbouring excited collective normal deformed cluster band.

2.11 Nuclear Physics with Neutrons

New interesting results have been obtained in experiments with neutrons.

As was predicted in 1994 by Professors Alexander Frank from the Frank Laboratory of Neutron Physics and Vadim Nosov from the "Kurchatov Institute", the well-known phenomena of neutron diffraction may take new features when neutrons are diffracting on a moving object. These two authors analysed the situation when a periodical structure, diffraction grating, is moving across the neutron beam. In this case the transmitted wave in each point of a beam is modulating in phase or amplitude with the frequency, depending on the grating velocity and the grating space period. The resulting state is then a superposition of coherent waves with a discrete spectrum.

The JINR-"Kurchatov Institute"-"Institute Laue Langevin" collaborative group has observed this quantum effect experimentally with the help of a device also based on quantum principles. The neutron Fabry–Perot interferometers were used for the precise spectroscopy of the ultra cold neutrons that were passed through the rotating phase grating, manufactured on the surface of a silicon disc. The obtained results on energy splitting may be interpreted as a manifestation of the phase modulation of the neutron wave by the moving grating.

2.12 Low- and Intermediate-Energy Physics

The unique experimental investigations of the μ-catalysis process in a deuterium/tritium mixture have been conducted at the JINR Phasotron with the help of the unique high pressure tritium target that was constructed at the Russian Federal Nuclear Centre – All-Russian Scientific Research Institute of Experimental Physics in Sarov. Measurements were made in a wide range of the mixture parameters, namely density, temperature and tritium concentration. The comparison of the experimental data with the theory confirms the main mechanisms considered in the theory but the full qualitative description of the process is not achieved yet. The parameters of the radioactive capture reaction in deuterium from the muonic molecule state will be measured in 2005.

Investigations of rare decay and search for forbidden decays of pions and muons are carried out at the PIBETA detector using the world's best meson beams at the Paul Scherrer Institute in Switzerland. The detector was designed and constructed by the collaborative group involving the University of Virginia and Arizona State University (USA), the Paul Scherrer Institute, the JINR Dzhelepov Laboratory of Nuclear Problems, the Institute for High Energy Physics in Tbilisi (Georgia), the Institute for Nuclear Studies in Swierk (Poland) and the Rudjer Boskovic Institute in Zagreb (Croatia). The contributions of the Dubna team are a unique shower detector and multiwire proportional cylindrical chambers with modern electronics. The detector has been successfully used for data-taking in experiments since 1999. The pion beta decay, the radiative pion and muon decays were studied. The data set obtained represents an improvement in precision over the existing world average. The new data set is analysed now.

2.13 Elementary Particle Physics

Participation of JINR physicists in the design and construction of modern detectors is requested by many institutions. At Council sessions I have demonstrated more than once our involvements in the LHC project. In 2004, considerable progress was achieved here.

Thus, the series production and tests of the elements of the LHC transverse feedback system for damping of beam oscillations are in progress. In cooperation with Belarus, 30 screen monitors were made at the Laboratory of Particle Physics. The monitors were tested successfully in October 2004 in the channel of the beam transportation from SPS to the LHC.

In December 2004 the assembly of the Barrel Tile-Calorimeter for ATLAS was completed in the LHC pit. Two days ago the first muon chamber was installed in the pit. The assembly of the calorimeter and preshower suspension system for CMS is in progress. In October 2004 the dipole magnet for ALICE, which was manufactured at the Savelovo plant near Dubna, was tested at the full current of 6 kA during several days at both polarities. All parameters which were monitored correspond to specification.

I wish to emphasize that the manufacturing of almost all elements in the framework of the JINR obligations for the ATLAS, CMS and ALICE detectors have been completed. It is time to direct every effort to the development of the physics programmes. Tomorrow Professors Alexei Sissakian, Nikolai Rusakovich, Igor Golutvin and Alexander Vodopianov will present reports on physics at the LHC and JINR's participation in this activity.

Speaking about the JINR participation at CERN, I would like to specially mention the NA48 experiment.

I am sure you know that the most precise result of the measurement of the direct CP-violation effect has been obtained in the NA48 experiment. A new result is the definition of the value of the Cabibbo–Kabayashi–Maskawa (CKM) matrix element *Vus* which is in good agreement with the result of the E865 experiment at BNL and predictions of the Standard Model and which confirms the unitarity of the CKM matrix. Detailed information about the latest results of the NA48 experiments will be presented by Dr. Evgeni Goudzovski this afternoon.

Professor Vladimir Kekelidze is the leader of the NA48 collaborative group at JINR. Let me remind you that he was appointed by the Director General of CERN as a member of the LHCC for 3 years starting from September 2003. On 17 December 2004 his duties were extended in the positions of the NA48 Steering Committee Chairman and of the NA48/2 Spokesperson until the end of 2005. By decision of the CERN Selection Committee held on 23 November Prof. V. Kekelidze was appointed as Paid Scientific Associate at CERN in Physics Department starting from 1 February 2005. Due to these circumstances the JINR Directorate proposes to appoint Doctor Richard Lednicky, Deputy Director of the Laboratory of Particle Physics, as Acting Director of this Laboratory until 31st of January 2006. This appointment was agreed upon with Professor Rostislav Mach, the Plenipotentiary of the Czech Republic.

The various aspects of joint collaboration were discussed during visits of the CERN Directorate delegations to Dubna. On 16 April 2004 CERN's Director-General Dr. Robert Aymar together with other members of the CERN management, Dr. Nikolas Koulberg and Prof. John Ellis, visited JINR. Dr. Jos Engelen, Deputy Director-General, visited JINR on 11 November 2004. Our colleagues from CERN visited the Institute Laboratories where they were informed about JINR activities at CERN.

Let me remind you that a year ago I demonstrated a slide with the theoretical analysis of the asymmetries that were obtained under the guidance of Professor Anatoly Efremov from BLTP. Predictions were made for single spin azimuthal asymmetries in pion production from Semi-Inclusive Deep Inelastic Scattering off transversely and longitudinally polarized targets. In 2004 the single-spin asymmetries for semi-inclusive electro-production pions in deep-inelastic scattering of positrons were measured with transverse target polarization in the HERMES experiment at DESY. The Collins and Sivers asymmetries measured are connected with a new spin-dependent structure function transversity, characterizing transverse quark distributions in nucleons. I would like to congratulate the HERMES collaboration, in which JINR physicists participate, on the first observation of transversity.

The results mentioned above as well as new results in the field of particle physics were presented at the world's largest conference on high energy physics, 32nd Rochester Conference, which was held in August in Beijing (China). JINR's large delegation to this conference presented many talks and reports on the topics of this forum.

During our visit to China the JINR delegation had many meetings with Chinese scientific officials and authorities. On 19 August 2004 an Agreement on cooperation was signed between JINR and the Institute of High Energy Physics of the Chinese Academy of Sciences. The JINR Directorate plans to sign an agreement between JINR and China at the governmental level.

Concluding the section of the report dedicated to particle physics I would like to mention about the utmost importance of particle physics for cosmology. The particle physics and cosmology accumulate now new data about the Universe and its creation by using large colliders of charged particles and modern detectors on Earth observatories and in satellites. Today cosmology becomes more and more a quantitative science.

Despite the fact that we have at our disposal successful models of the elementary particles and of the evolution of the Universe (that have been tested with high precision) it is widely recognized that the Standard Model of elementary particles and cosmology may not be complete.

Recent astronomical observations show that the Universe is presently expanding with acceleration. This remarkable discovery suggests that the bulk of energy density in the Universe is gravitationally repulsive and appears like unknown form of matter with negative pressure. This unknown matter is called dark energy. It is believed that a new particle and/or gravitational physics is required to explain the acceleration of the Universe. It is really a great challenge for modern particle physics.

Yesterday Academician A. Logunov presented at the BLTP seminar a report on the basis of the article prepared together with Professors S. Gershtein and M. Mestrvirishvili. It was shown in the article that the universal property of gravitational field to slow down the rate of time leads in the field theory to a fundamental property – generation of effective forces of repulsion.

2.14 Radiation and Radiobiological Research

More than 40 years ago, radiobiological investigations were started at the JINR basic facilities. These studies were connected with the modelling of biological effect of space radiation (mainly protons with high energy) and with the study of biological efficiency of proton beams for cancer therapy

A wide spectrum of radiobiological investigations was carried out and these tasks were solved successfully. In the last years in the Department of Radiation and Radiobiological Research (DRRR), the genetic effects of high-energy heavy ions are being intensively studied. These studies are aimed at modelling the biological action of Galactic heavy charged particles. As is known, the “radiation barrier” is one of the main obstacles on the way to realization of long space flights.

The effective tool for modelling cosmic heavy charged particles is the Nuclotron. The genetic effects of heavy ions, cataract genesis and retina damages by accelerated charged particles are investigated now in the Department. The new powerful molecular dynamics method for analysis of mutagenic processes in the living cells was developed and implemented successfully at DRRR. The first Workshop on this field was held in Dubna in collaboration with specialists from Japan (RIKEN).

I would like to stress that specialists in space radiobiology from different countries, and especially from China, are very interested in collaborating with JINR on radiobiology of heavy charged particles. Taking into account the importance and increasing role of biological sciences, the JINR Directorate is presently considering an idea of reorganizing the Department of Radiation and Radiobiological Research into a Laboratory of Radiation Biology.

2.15 Educational Programme

In 2004, the University Centre hosted Summer Student Practical Courses in JINR fields of research, which were organized jointly with the Czech Technical University in Prague, Adam Mickiewicz University in Poznan, Moscow State University, and Moscow Engineering Physics Institute. The Courses were supported by the Plenipotentiaries of Bulgaria, the Czech Republic, Poland, and Romania. During a month the practical courses were attended by 36 students from Bulgaria, the Czech Republic, Poland, Romania, Russia, Slovakia, and Ukraine.

I wish to note that the results of the practical courses were reviewed at a seminar in Poznan on 23 October 2004 where Polish students presented their contributions. In this hall you can see a photo exhibition dedicated to the practical courses and the seminar.

The lecture programmes of the “Dubna International Advanced School of Theoretical Physics” (DIAS-TH), which started in 2003, are actively implemented. 5 schools will be organized in 2005. The JINR Directorate invites all interested young scientists to participate in these schools.

2.16 Conferences and Meetings

51 conferences, workshops, schools and other meetings were organized by JINR in 2004. Some of them were organized in association with other research centres. These conferences took place in Dubna and in Armenia, Belarus, the Czech Republic, Poland, the Russian Federation, the Slovak Republic, and Spain.

As a remarkable event I would like to mention the Memorial Conference dedicated to the 95th anniversary of Academician N.N. Bogolyubov and called “The International Conference on Problems of Theoretical and Mathematical Physics”. It was organized by JINR and the Russian Academy of Sciences with support of the UNESCO Office in Venice. The Conference was held in September 2004 in Moscow and Dubna. About 150 physicists from 21 countries participated in the Conference.

The IN2P3 - JINR Joint Scientific Seminar dedicated to the 30^{th} anniversary of scientific cooperation was held on 30 September – 1 October 2004 in Dubna. The seminar brought together representatives of the government bodies from the French Embassy, which was represented by Counsellor Bernard Fleutiaux, and CNRS as well as of the scientific communities from IN2P3 and French research centres. The IN2P3 – JINR collaboration is playing an exceptionally important and positive role in modern particle and nuclear physics. Joint projects and programmes open new horizons for physics. The progress achieved brings access to knowledge, new information and modern

technologies. We can see the influence of our collaboration also beyond science. For example, one of the streets in Caen, near GANIL, is named as “Dubna Avenue”. It crosses the “Cambridge Avenue”.

I would like also to mention the Workshop on scientific cooperation between Hungarian research centres and JINR that was held in Budapest in September 2004. The Workshop was dedicated to evaluation of joint projects implemented in frameworks of the Agreement between the Hungarian Academy of Sciences and JINR. The Workshop participants recommended to prolong this Agreement. It is planned to sign the Agreement at the end of January 2005 in Budapest.

On this week the 5th Workshop on the Scientific Cooperation between German Research Centres and JINR was held. It was a regular meeting of experts to evaluate our cooperation in the framework of the Agreement signed in 1991 and continued four times. In the Summary of Workshop the participants included the statement that “It is in the interest of both JINR and the German research groups to continue the cooperation in the future. The participants of the workshop strongly recommend the prolongation and extension of the scope of the JINR–BMBF Agreement.”

3 Conclusion

The last section of my report concerns the latest news of important events of December 2004.

3.1 Initiative on CIS Summit

Members of the Scientific Council already know about the initiative to include the issue dedicated to international cooperation in science and technology in the agenda of a summit of the Commonwealth of Independent States (CIS). At the meeting on the occasion of Russia’s Independence Day on 12 June 2004, President V. Putin recommended that I discuss this idea with Igor Ivanov, Secretary of the Security Council. In December 2004 Professors V. Matveev, A. Sissakian, A. Tavkhelidze and I met with Academician Yevgeni Primakov, the former prime-minister of the Russian Government. Now he is the President of the Chamber of Commerce and Industry. I asked him to organize a meeting with I. Ivanov. Mr Primakov telephoned immediately Igor Ivanov and Grigory Rapota, General Secretary of the Economic Community of Russia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan.

On that very day A. Sissakian and I met with Grigory Rapota. The meeting with Igor Ivanov took place a week later, in Kremlin. Both meetings were very productive. In addition to the initiative concerning the summit, we discussed several problems of utmost importance for JINR, including the initiative on signing an agreement between JINR and China at the governmental level.

A week ago, on 14 January 2005, I received a fax message from the President of the National Academy of Sciences of Ukraine, Boris Paton. He is also the President of the International Association of Academies of Sciences. This non-governmental self-managing organization coordinates the activities of the Academies of Sciences of countries of the Former Soviet Union. B. Paton informed me that the similar idea of the scientific summit was discussed with the President of Kyrgyzstan, Askar Akaev, on 25 November 2004. President A. Akaev agreed to undertake a diplomatic mission for including the issue on the development of the scientific cooperation in the agenda of the CIS summit.

I believe that the plan for the summit dedicated to international cooperation in science and technology will be realized.

3.2 JINR-50

Concluding, I would like to mention that in 2004 CERN celebrated its 50th anniversary. The JINR Delegation took part in the CERN's Official 50th Anniversary Ceremony held on 19 October 2004.

The invaluable experience of CERN and also JINR in overcoming political barriers and in fostering scientific cooperation is successfully applied (in much more difficult conditions) in the establishment, under the aegis of UNESCO, of the International Centre for Research and Advanced Technology in Jordan, where a new-generation synchrotron source, called SESAME, will be constructed.

The recent meeting of the SESAME Scientific Council was held in Jordan in December 2004. The construction of the facility was started in 2004. Professor Serguei Kapitza and I represented Russia at this meeting. I would like also to inform you that Russia intends to change its official status in SESAME from observer to participating state.

Next year JINR will celebrate its 50th anniversary too. The official ceremony will be held on 26 March 2006. The JINR Directorate is now discussing the celebration plans which will be presented at the meeting of the JINR Committee of Plenipotentiaries on 17-18 March 2005.

So much for the information about the implementation of the recommendations of the Scientific Council’s 95th and 96th sessions, the main features of the JINR scientific programme in 2005, and latest news.

Thank you for your attention.