COLLABORATION IN SCIENCE AND TECHNOLOGY

The basic results of the international cooperation in science and technology of the Joint Institute for Nuclear Research in 2010 reflect the following data:

- joint research has been conducted with scientific centres in the Member States, as well as with international and national organizations in other countries on 39 topics of first priority and 4 topics of second priority;
- to solve cooperation issues and questions of participation in scientific meetings and conferences, the Joint Institute sent 2526 specialists;
- for joint work and consultations, as well as for participation in meetings, conferences and schools held at JINR, 1727 specialists were received;
- 38 international scientific conferences and schools, 26 workshops, and 14 meetings were organized and held;
- 13 scholarship holders worked at the Institute laboratories.

The international cooperation of JINR is presented in agreements and treaties. Its development comprises joint experiments at basic facilities of physics centres, the acquisition of research data, preparation of joint publications of the joint research results, the supply of equipment and techniques for the interested sides, etc.

On 12 January, Head of the German Research Foundation (DFG) office in RF Doctor J. Achterberg and the office staff member G. Melnikova visited JINR. The Institute Vice-Director M. Itkis received the guests and spoke to them about the history of the establishment and development of the Joint Institute, its main experimental facilities and research trends, and cooperation of JINR with research centres and universities of Germany. A. Ruzaev, D. Kamanin, and A. Popeko took part in the meeting.

Doctor J. Achterberg, who has been serving as Head of the DFG office in RF since October 2009, spoke about the history of the Foundation and aims of his visit. The German Research Foundation was established in 1918 to support fundamental research in Germany. Today it includes 96 members, among them 69 universities of Germany, research organizations, such as the Max Planck Society and the Helmholtz Association, and 8 Academies of Sciences. The activities of DFG are state financed (60% from the state budget and 40% from the budgets of federal lands); in 2009 its budget was 2.5 milliard euros. It supports projects that are selected by experts and aimed at fundamental research in all fields of knowledge, from nuclear physics to archeology. Special supporting programmes are worked out for students and postgraduates. DFG cooperates with the Russian Academy of Sciences, RF ministries, and RFBR.

«We would like to offer JINR additional projects in our programmes», said J. Achterberg. «The participation of Russian and German JINR staff members in them should also be bilateral — through DFG and, for example, RFBR». The guests had an excursion to FLNR.

On 15 January Governor of the Moscow Region B. Gromov received Dubna Mayor V. Prokh and JINR Director Academician A. Sissakian in the Hall of the Moscow Region government. The Dubna representatives informed the Governor on the results of 2009 and future plans. In particular, they discussed the work on the synthesis of element 117 of the periodic table, implementation of the NICA project, the establishment of the International Innovation Centre for Nanotechnology of CIS countries, and other projects of JINR and Dubna.

On 20 January, a delegation from JINR was received by Ambassador Extraordinary and Plenipotentiary of Mongolia to RF D. Idehvkhtehn. During the talks, he assured the representatives of JINR that Mongolia considers its participation in the activities of the Joint Institute for Nuclear Research very important and stressed the necessity to pay special attention, along with traditional and new scientific trends, to the use of educational potential of the Institute and training of a generation of young researchers. The participants of the meeting also discussed innovation activities developed at JINR.

The Ambassador heartily supported the proposal of the Institute to hold the scientific meeting «Novel Future

for Cooperation: From Elementary Physics to Nanotechnologies» in June in Ulaanbaatar and promised support in its organization.

Chief Federal Inspector of the Moscow Region staff of the RF President Plenipotentiary in the Central Federal District S. Zagidullin visited JINR **on 21 January**. Receiving the guest at the Directorate, JINR Director Academician A. Sissakian acquainted him with the strategic programme of the development of the JINR experimental base.

S. Zagidullin visited the Veksler and Baldin Laboratory of High Energy Physics where he learnt about the scientific programme of the NICA project and plans for its implementation which envisage active involvement of CIS countries, primarily Belarus. The guest was also informed on the information and computational capability of the grid system that is applied at JINR in LHC data processing and analysis, and the programme on the development of instruction systems.

The General Agreement on Cooperation between the European Organization for Nuclear Research and the Joint Institute for Nuclear Research was signed **on 28 January** at CERN. Directors of the two international scientific centres R.-D. Heuer and A. Sissakian ceremonially signed the document.

JINR and CERN have an intense concern in equal cooperation both in fundamental research in elementary particle physics and in innovation and educational activities, as well as in the development of scientific infrastructure and the general approach to the access to published scientific references.

The General Agreement envisages, in particular, the involvement of JINR scientists and specialists in experiments at the LHC and other CERN accelerators, in the development of the LHC injection system, research in accelerator physics and technology, including the CLIC project and the International Linear Collider, partnership relations in the development of detectors for future accelerators and upgrading of the grid computer environment. CERN scientists and specialists will take part in the activities on the JINR Nuclotron upgrading and in the NICA/MPD project. Joint studies in theoretical physics will continue in the domains connected with life sciences and application of nuclear physics methods in medicine. The Agreement is meant for 5 years, with a possibility of further «automatic» prolongation, provided both sides express their reciprocal accord.

On 10 February, RF Security Council Secretary N. Patrushev, accompanied by a representative delegation which included Deputy Secretary of RF SC Yu. Baluevsky, Hero of Russia pilot-cosmonaut Yu. Baturin, and First Deputy Chairman of the Moscow Region government I. Parkhomenko, visited JINR and SEZ «Dubna».

A meeting was held at the International Conference Hall and attended by prominent scientists, leaders of the city scientific industrial enterprises and SEZ resident companies, the city administration and authorities of the special economic zone.

JINR Director Academician A. Sissakian made a presentation about JINR as an international intergovernmental organization. He spoke about fundamental research in particle physics, nuclear physics and condensed matter physics, new promising scientific projects, innovative elaborations of scientists and specialists, and the educational component in the activities of the Institute. A. Sissakian marked that the Joint Institute prepared above 50 innovation projects to be implemented in the special economic zone, keeping in mind that 9 SEZ resident companies originate from JINR. Speaking about the aim of his visit, N. Patrushev said that national priorities determine the strategy of the national security. He stressed that science, education and technology as a major strategic national priority should be treated with serious attention.

The RF SC Secretary and the accompanying persons visited the Veksler and Baldin Laboratory of High Energy Physics, where JINR Deputy Chief Engineer G. Trubnikov acquainted the guests with the project of the storage accelerator complex NICA/MPD.

JINR Vice-Director M. Itkis informed the RF SC Secretary on advanced studies of the superheavy elements' synthesis at the Flerov Laboratory of Nuclear Reactions and acquainted him with one of JINR innovation projects which concerns the development of an accelerator complex to test electronic equipment used in aviation and space technology. Deputy Director of the Laboratory of Information Technologies Professor V. Korenkov spoke to the guests about the global computer distribution system used at JINR. Professor M. Sapozhnikov demonstrated the equipment elaborated at JINR for the identification of explosives and drugs as an example of application of nuclear physics methods in control systems. Leader of another project Professor Yu. Panebrattsev acquainted the guests with instruction programmes elaborated at JINR. The guests visited the Synchrophasotron and the Nuclotron. JINR Director A. Sissakian presented N. Patrushev an image of a track of an electron discharge («a lightening») developed in plexiglass, to remind of the visit.

In the left-bank part of the special economic zone «Dubna» N. Patrushev and the accompanying persons visited an exhibition of innovation projects and got acquainted with the conditions created for the work of industrial companies. They were also informed about the development plans for the special economic zone.

On 18 February, on the first day of the 107th session of the JINR Scientific Council, an Agreement on cooperation between the Joint Institute for Nuclear Research and the Budker Institute of Nuclear Physics of the Siberian Branch of RAS (Novosibirsk) was signed.

Directors of the two institutes RAS Academicians A. Sissakian and A. Skrinsky signed the document that

provides cooperation in the development of large electrophysical complexes and other equipment for fundamental and applied research, operation and upgrading of this equipment, its joint exploitation and conducting experiments. The priority trend of the cooperation is the design and development of basic «home» projects: the NICA/MPD heavy-ion complex with colliding beams at JINR and the electron–positron collider «Super-C-Tau Factory» at the Budker INP. Innovation sphere will be motivated with a number of trends, including the development of nuclear-medicine techniques, the development and use of heavy particle accelerators, detector systems for fundamental and industrial applications.

On 22–23 February, the 20th meeting of the Coordinating Committee on the Implementation of the Agreement between the Federal Ministry of Education and Research of Germany (BMBF) and JINR on cooperation and use of JINR facilities was held in Dubna. D. Kern (the BMBF Department of Fundamental Research) headed the German delegation. JINR Vice-Director M. Itkis informed the Committee on most important scientific results of 2009, the seven-year plan for JINR strategic development in 2010–2016, and projects for the development of basic facilities. The BMBF representatives informed the JINR colleagues on modern tendencies of the fundamental research development in natural sciences in Germany and, in particular, on prospects for the FAIR and XFEL projects.

A Vietnamese delegation headed by Vice-President of the Academy of Sciences and Technology of Vietnam (VAST) Professor Nguyen Dinh Kong come to JINR on a working visit **on 22–27 February**. The delegation included representatives of VAST and the Embassy of Vietnam in RF, directors and leading researchers from scientific institutes of Vietnam. As the Head of the delegation said, the aim of their visit was to widen and strengthen cooperation between JINR and VAST, primarily in information technologies and heavy-ion physics, as well as to discuss the approaches to attract young specialists to science and to physics, in particular. It was decided that a memorandum of understanding would be signed on the results of the negotiations. It will become a new stage in the development of mutually beneficial cooperation between JINR and VAST.

The guests accompanied by Plenipotentiary of Vietnam to JINR, JINR SC member Nguyen Van Hieu and Leader of the JINR staff members from Vietnam Nguyen Manh Shat visited the main basic facilities, met with directors of JINR laboratories, and discussed prospects for cooperation. They also visited the special economic zone and SPC «Aspekt».

On 25–27 February, a delegation from the Republic of Serbia visited JINR to take part in the first coordinating meeting on the Serbia–JINR cooperation programme «Condensed Matter Physics with Ion Beams» that was held at the Flerov Laboratory of Nuclear Reactions. Serbia was represented by researchers from the laboratories of physics, material sciences, radiation chemistry and physics of the Vinca Institute of Nuclear Sciences (Belgrade) headed by the leader of the FAMA project Professor N. Nešković. First Counsellor of the Serbian Embassy in RF M. Milošević was present at the opening ceremony of the meeting. He noted that strengthening of ties with JINR is very important to Serbia. The participants signed a resolution on the results of the meeting which designated first particular projects supposed to be implemented in the framework of the associate membership of Serbia to JINR.

On 1–6 March, JINR Vice-Director R. Lednický and Adviser to JINR Director G. Kozlov visited scientific centres of the US Department of Energy (DOE) — the Brookhaven National Laboratory (BNL) and the Fermi National Accelerator Laboratory (FNAL). The aim of their visit was to discuss mutually beneficial long-standing cooperation of JINR with BNL and FNAL. As a result, the Protocol for BNL–JINR cooperation and the Agreement on scientific cooperation between FNAL and JINR were signed, for 5 years each.

BNL Director Professor S. Aronson and JINR Vice-Director R. Lednický signed the Protocol in the framework of BNL–JINR cooperation. Leading specialists and chiefs of the main scientific and technical departments of the laboratory took an active part in the discussion. The document envisages, in particular, the involvement of JINR in the STAR experiment at the relativistic accelerator of heavy ions RHIC, as well as joint BNL–JINR work in the preparation and accomplishment of the concept, and elements of the NICA accelerator and the multipurpose detector MPD. The Protocol reflects intentions to develop collaborations in nanotechnology and functional nanomaterials, and mutual interest of the sides in the development of the educational internet-project «Online Science Classroom», which is directly connected with scientific research at BNL and JINR.

In the talks with the leaders of FNAL, the sides marked great contribution made by JINR specialists for many years both to the CDF and D0 experiments, physics analysis and detector operation, and to the whole research in high-energy physics. The Agreement between FNAL and JINR on scientific cooperation for the next five years was signed by FNAL Director Professor P. Oddone and JINR Vice-Director R. Lednický. The document overlaps a wide range of activities in current experiments and elaborations, as well as future prospects for the joint involvement in global projects that will be implemented in FNAL and Dubna. In particular, it envisages active participation of JINR in the current experiments CDF and D0, in new projects — the Mu2e experiment, the global X-project, and the development of a muon collider and a neutrino factory.

The involvement of FNAL in the NICA/MPD project is sttressed particularly. It will include the joint project and concept design, manufacturing and testing of separate elements, parts and the whole NICA/MPD complex, and its preparation for operation. Joint work is planned in the design of separate elements and parts of the International Linear Collider (ILC), their future manufacturing, testing, and assembling.

Ambassador Extraordinary and Plenipotentiary of Mongolia to RF D. Idehvkhtehn and his spouse accompanied by the Embassy staff members — Ambassador Counsellor on economic issues B. Ehrdehmbilehgt with his spouse and Second Secretary of the Embassy Zh. Bayarkhuu — had a working visit to Dubna **on 12–13 March**.

At the meeting at the JINR Directorate, the delegation was informed on the history of the Institute, the main trends of research at JINR, and prospects for its development. The speakers marked the contribution of famous Mongolian scientists to the establishment and development of the Institute, primarily of Academician N. Sodnom, as well as the traditional involvement of Mongolian physicists in the accomplishment of the JINR scientific research programme. The key topic of discussions was the plan to hold the international conference «New Prospects for Cooperation with JINR: From Elementary Particle Physics to Nanotechnology» in Ulaanbaatar. JINR Vice-Director M. Itkis, LRB Director Professor E. Krasavin, FLNP Deputy Director Professor D. Sangaa, Deputy Chief Scientific Secretary D. Kamanin, Leader of the JINR Mogolian national group O. Chuluunbaatar, and staff member of the Department of International Relations, responsible for contacts with Mongolia, M. Loshchilov took part in the meeting.

The guests visited VBLHEP, FLNR, DLNP of JINR and SPC «Aspekt», and could see how fundamental research, elaborations for applied studies, and innovation projects are conducted at JINR.

From 12 to 21 April, FLNP Director Professor A. Belushkin and Deputy Director of the Laboratory D. Sangaa visited universities, neutron scientific research and synchrotron centres in South Korea and Taiwan.

At the National University of Seoul (South Korea) A. Belushkin made a report on scientific trends of the JINR Frank Laboratory of Neutron Physics and spectrometers developed for research at the IBR-2 reactor. Director of the Centre for Research of Nuclear Materials of the National University of Seoul Professor Il Hvan spoke to the guests from JINR about latest scientific results. He also organized an excursion to the research laboratories of the University. Interesting discussions were held on the potential cooperation in the studies of nuclei transmutation and condensed matter research, including the topic of internal tension of materials for atomic industry. The guests also talked to their Korean colleagues about short-term training courses and practice for Korean students at JINR and at the IBR-2 reactor.

During the visit to the Centre of Nanophysics of Yonsei University (Seoul, South Korea) the guests from JINR had meetings with professors and researchers of the Centre. New nanomagnetics and nanomaterials with specific properties for hydrogen energy industry are developed at the Centre. A. Belushkin and D. Sangaa were shown an electric generator that works on solid cell fuel, laboratory rooms equipped with modern facilities to obtain various samples with nanostructures, research electronic and optical microscopes, photoelectronic and X-ray spectrometers. Korean colleagues showed their interest in experimental capacity of diffractometers and spectrometers at the IBR-2 reactor, and expressed their wish to take part in joint projects on studies of nanomaterials with the neutron scattering method.

Head of the Research Centre of Quantum Space and Time of Sogang University Professor Bun Li told the representative of JINR about their successful cooperation with theoreticians from Dubna.

In the National University of Taipei (Taiwan) a talk was held with Chairman of the Taiwan physics society Professor Chao Fu and Professor Iee Sing. The development of closer contacts in the studies of magnetic liquids with neutrons was discussed.

A. Belushkin and D. Sangaa visited the Hsinchu science city where many universities are located and a science park there that integrates university research results with innovative applications. They also visited the National Tsinghua University where a 2 MW research neutron reactor is installed, and the National Synchrotron Research Centre of 25 research stations with a beam energy of 1.5 GeV. The scientists from Dubna saw all the beam stations at the Synchrotron Centre as they are used in material science, biology, and other fields of research. A. Belushkin gave a lecture «Self-organizing Objects and Neutron Research to Study Them»; it was followed by a discussion with specialists in various scientific trends. Taiwanese scientists expressed their intention to cooperate with JINR in producing nanoclusters in bio-objects under high pressure and upgrading of experimental equipment.

State Secretary of the Belarus–Russia Union State P. Borodin visited JINR **on 13 April** for getting acquainted in detail with the Institute and status of the implementation of the project «Centre for Fundamental Research and Innovations on the Basis of the NICA Accelerator Complex».

P. Borodin and the accompanying persons visited the Veksler and Baldin Laboratory of High Energy Physics and saw the upgrading process at the Nuclotron around which the NICA collider is planned to be developed. VBLHEP Director Professor V. Kekelidze told the guests about a trend of applied research — the technology of superconducting magnets — developed in

Dubna and used today in the construction of accelerators in leading scientific centres of the world. Deputy Director of the Laboratory of Information Technologies Professor V. Korenkov showed the guests the grid system in action, which allows data processing from the Large Hadron Collider (LHC, CERN) directly in Dubna. Professor Yu. Panebrattsev presented on-line workouts in education.

P. Borodin and the accompanying persons also visited the Flerov Laboratory of Nuclear Reactions where they saw the accelerator complex of the cyclotrons U400–U400M and other unique facilities developed there. FLNR Director Professor S. Dmitriev spoke to the guests about leading research of Dubna scientists in the synthesis of superheavy elements and innovative elaborations at the laboratory. Further plans for the involvement of the Union State in the NICA project were discussed.

A joint meeting of the chair of experimental methods in nuclear physics of Mocsow Engineering Physics Institute (MEPI) and leading scientists and specialists of JINR was held **on 16 April** at the International Conference Hall.

In his report, Academician A. Sissakian marked the main milestones in the development of the Institute and spoke about his interest in partnership relations in projects to develop new accelerator complexes, including the construction of a heavy-ion accelerator complex for MEPI.

Scientific Leader of the Flerov Laboratory of Nuclear Reactions Academician Yu. Oganessian started his report «Heavy Ions and Superheavy Elements» with reminiscences about his student life in Moscow. Speaking about the latest results in the research in the synthesis of element 117, he stressed that many leading accelerator specialists involved in this study had graduated from MEPI. MEPI Rector Professor M. Strikhanov presented Academician Yu. Oganessian a Diploma of Professor Emeritus of the National Research Nuclear University MEPI and the «red pass» that gives the right to visit any laboratory or any hall at any time.

Professor V. Grigoriev, who has been head of the chair in the recent years, spoke about his predecessors — leaders of the chair, students and postgraduates, scientific research and contacts of the chair with leading nuclear physics centres of Russia and the world.

The participants of the meeting visited the Flerov Laboratory of Nuclear Reactions. FLNR Director Professor S. Dmitriev told them about applications of heavy ions in modern technology; B. Gikal spoke about heavy-ion accelerators. Excursions were organized for the guests to the FLNR accelerators and the accelerator complex of the Veksler and Baldin Laboratory of High Energy Physics NICA/Nuclotron-M. Professor A. Sorin made a report «Heavy-Ion Physics at High Energies and the NICA Project». As the participants of the meeting said, their acquaintance with the Institute programmes of education and research and discussions of the plans to train young specialists for JINR in the field of heavy-ion physics and application of nuclear physics methods in high technology will play an important role in the development of JINR–MEPI partnership.

A delegation of the Renova group headed by chairman of the supervisory committee V. Vekselberg visited JINR and SEZ «Dubna» **on 24 April**. V. Vekselberg is also a coordinator of the Russian part of the project to establish a research centre in Skolkovo near Moscow.

The guests visited the Veksler and Baldin Laboratory of High Energy Physics where they got acquainted with the project to develop the accelerator complex NICA/Nuclotron-M for fundamental and applied research and a number of innovation projects that are already implemented at the Institute, including those that use opportunities of the special economic zone «Dubna».

On 28 April, President of the Russian Academy of Medical Sciences (RAMS) M. Davydov, directors and leading specialists of the Blokhin Russian Oncological Scientific Centre B. Dolgushin, S. Tkachev, D. Matsuka and representatives of the corporate group «Almaz Antej» G. Kozlov, and V. Shevchenko visited JINR. A. Sissakian, G. Shirkov, A. Olshevsky, E. Krasavin, G. Trubnikov, E. Syresin, G. Mitsyn, and E. Luchin received the guests at the JINR Directorate. Issues of joint work on the project of the proton–ion complex for oncological diseases treatment were discussed.

The delegation visited the Dzhelepov Laboratory of Nuclear Problems, where a new specialized proton–ion cyclotron is being developed in collaboration with specialists of IBA, a Belgian company. The guests also had an excursion to the Veksler and Baldin Laboratory of High Energy Physics.

On 15–17 May a delegation from the Republic of Cuba visited JINR. It included Director of the Institute of Scientific and Technical Information (IDIKT) C. Sanchez and chief of IDIKT Department of International Contacts L. Machado.

The guests visited the JINR University Centre where they attended the opening ceremony of practice courses for students from Egypt. Acting Director of the UC S. Pakuliak spoke to them about programmes of schools and training courses for students and young specialists from JINR Member States. At the Laboratory of Information Technologies P. Zrelov, V. Korenkov, T. Strizh, and Zh. Musulmanbekov acquainted the Cuban guests with the main trends of research at the laboratory and a wide range of applications of grid technology. S. Sidorchuk spoke to the guests about the research programme at the Flerov Laboratory of Nuclear Reactions; P. Zarubin met the guests at the Veksler and Baldin Laboratory of High Energy Physics.

The visit was concluded with a talk at the JINR Directorate. The main topic of the discussions was the

intention expressed by the guests to restore scientific and technical contacts of the Republic of Cuba with the Joint Institute.

On 24 June, a joint delegation of CERN technological services, JSC «NPO Geliymash», and the German company «Messer» visited JINR. Negotiations were held at the JINR Directorate, including the representatives of the Moscow Region government. The guests visited the Veksler and Baldin Laboratory of High Energy Physics, saw the upgraded superconducting accelerator Nuclotron, and got acquainted with the project to develop on its basis the NICA collider. According to previous agreements, CERN and JSC «NPO Geliymash» will participate in the latter. The day finished with a press conference in the hotel «Dubna», held by General Director of NPO Geliymash V. Udut.

The company «Messer» produces cryogenic products, but it buys a considerable amount of liquid helium in Russia and provides its deliveries for the LHC at CERN. Strong partnership ties have been established between JINR and NPO Geliymash. The latter delivers cryogenic equipment to Dubna, while one of its enterprises produces liquid helium. The new screw compressor delivered to JINR by Geliymash for compressed helium with a capacity of 6 thousand cubic meters per hour permitted one to double cryogenic capacity of the VBLHEP accelerator complex. This equipment has been purchased for the NICA project provision.

The CERN delegation, headed by chief of the technological department F. Borderie, included chief of the cryogenic group L. Tavian, chief of a sector C. Bart, deputy chief of a group responsible for cryogenic liquids D. Delikaris, and chief of a group A. Unerwik. F. Borderie marked that there are 130 t of liquid helium in the LHC cryogenic provision system half of which originates from Orenburg, Russia. Vice-President of the company «Messer» U. Schlegel said that NPO Geliymash fulfilled its obligations in a very responsible and accurate manner to deliver such an immense amount of helium during the launch of the LHC, strictly according to the schedule.

G. Trubnikov marked that at JINR there are interesting approaches in the detection of a superconductivity slip that are used in the FAIR project (Darmstadt, Germany) and can be of interest to CERN. In applied research planned at the accelerator complex Nuclotron-M/NICA, special attention will be paid to the studies to develop new alternative energy sources.

On 25 June, a delegation from the Hanoi Institute of Physics (Vietnam) visited JINR. The guests saw the MT-25 microtron and the IC-100 isochronous cyclotron at the Flerov Laboratory of Nuclear Reactions, and discussed with FLNR Director S. Dmitriev issues of upgrading of the less powerful microtron purchased in St. Petersburg. At the JINR Directorate, the delegation was received by Vice-Director R. Lednický, Chief Scientific Secretary N. Russakovich, head of the International Cooperation Department D. Kamanin, and leader of the Vietnamese national group Nguyen Manh Shat. Director of the Institute of Physics Professor Nguyen Dai Hyng invited JINR leaders to Hanoi in autumn, to attend the conference dedicated to the millennium anniversary of the capital of Vietnam.

MSU Prorector, head of the high-energy accelerators chair Professor A. Chernyaev and head of the experimental high-energy physics department Professor Eh. Boos visited JINR **on 27 June**. The guests got acquainted with great interest with physics research and accelerator facilities at JINR laboratories, in particular with the experience in the treatment of oncoligical diseases with proton beams, the DRIBs and NICA/MPD projects. The main topic of the discussion at the Directorate was the training programme for MSU students and masters in accelerator topics in Dubna — at the UC and MSU SRINP department.

On 7 July, a delegation of the JSFC Sistema headed by the executive vice-president on project companies' management I. Temirov visited JINR and SEZ «Dubna». JSFC Sistema and JINR are the shareholders of the OJSC «Managing Company Dubna–Sistema» which has the SEZ resident status and makes its contribution to the development of innovation projects, including the one on the establishment of the Dubna Centre for Nanotechnology. I. Temirov held talks at the JINR Directorate, visited the Flerov Laboratory of Nuclear Reactions, and was acquainted with the fundamental and applied research here.

C. Kurrer, a representative of the general directorate on scientific research of the European Commission, visited JINR **on 9 July**. At the JINR Directorate a discussion was held on opportunities and further cooperation of JINR with European scientific organizations. The programme of the visit also included excursions to JINR laboratories. C. Kurrer saw the accelerators and physics set-ups of the Flerov Laboratory of Nuclear Reactions, the IBR-2M reactor which had already been integrated into the European scientific infrastructure, and the new source of resonance neutrons IREN. He also visited the Medical-Technical Complex of the Dzhelepov Laboratory of Nuclear Problems and got acquainted with cutting-edge techniques in semiconductor detectors. At the Veksler and Baldin Laboratory of High Energy Physics the guest was acquainted with the NICA-MPD project and the production line of large multiwire detectors. C. Kurrer expressed his satisfaction with the highly topical programme of the visit and indicated positive prospects for support of JINR initiatives.

In August, a collection «Streets and Alleys of Dubna» was issued. It was prepared by staff members of the JINR Scientific Information Department.

B. Starchenko is the author and compiler of the collection. The book is illustrated with photographs by N. Gorelov, P. Kolesov, E. Puzynina, Yu. Tumanov and photo materials from the JINR photo archive. The cover pages are designed by the artist Yu. Meshenkov.

The decision to name alleys in the Institute sites after outstanding scientists from the JINR Member States was taken by the JINR Committee of Plenipotentiaries on 25 March 1996, during the celebration of the 40th anniversary of the Joint Institute. As of now, 25 alleys at JINR have become memorial. They bear the names of the scientists who made basic contribution to the establishment of JINR, the development of scientific cooperation and obtaining scientific results of the world standard.

The names of the scientists of JINR are directly connected with the history of Dubna. Many streets in the city are called after researchers: A. Baldin, D. Blokhintsev, N. Bogoliubov, V. Dzhelepov, G. Flerov, I. Frank, F. Joliot-Curie, I. Kurchatov, M. Meshcheryakov, B. Pontecorvo, A. Sakharov, S. Vavilov, V. Veksler, and S. Vernov.

On 4–5 October, sessions of the Machine Advisory Committee upon the NICA project were held at JINR under the temporary chairmanship of M. Steck, head of the GSI Accelerator Department, who replaced Professor B. Sharkov. Among the experts of the Committee were representatives of the Fermi Laboratory (FNAL), Brookhaven National Laboratory (BNL, USA), ITEP (Russia), GSI (Darmstadt, Germany), and IKP FZJ (Jülich, Germany). Expert reports were also passed to the Committee by Professors T. Katayama (University of Tokyo, Japan) and A. Zlobin (FNAL, USA).

On the first day of the event, apart from the three key presentations — «NICA/MPD Project» (V. Kekelidze, Director of VBLHEP), «NICA Accelerator Complex» (I. Meshkov, scientific leader of the NICA Project), and «Nuclotron-M Project» (A. Sidorin, deputy leader of the VBLHEP Accelerator Department) — detailed reports were made at the session by leaders of the NICA project concerning the status of work on the elements and systems of the future complex (the ion source, HF systems, beam cooling systems, structure and configuration of the collider rings, superconducting magnets of the booster and collider). Each report was accompanied by discussion.

In the course of a working discussion with the experts, the Dubna developers received a series of recommendations and advice on further optimization of the collider structure. In the experts' opinion, the primary objective at this stage is to design the collider with such parameters that would provide maximal implementation of the principal physics task concerned with the study of super-dense, in terrestrial conditions, baryonic matter. In this regard, consideration should be given to the requirements needed for realization of the second and third stages of the project: proton–ion collisions and polarized beams programmes. It is also necessary to envisage a possibility for developing the complex in the future.

A few reports were dedicated to the progress in constructing the prototype elements of the future complex. Photographs of the assembled yoke of the prototype dipole magnet of the booster and fabricated elements of the yoke of the prototype dipole two-aperture magnet of the collider were demonstrated to the experts. Recommendations and remarks made by the experts at the end of the event were submitted to the JINR Directorate after final revision.

On 9 November, JINR was visited by a French delegation including M. Spiro, President of the CERN Council, M. Meyer, Head of Moscow Office of the National Centre for Scientific Research (CNRS), and M. Tararin, Science and Technology Attaché for the Embassy of France in RF. The guests were welcomed by JINR Acting Director M. Itkis, Vice-Director R. Lednický, Chief Scientific Secretary N. Russakovich, and Head of the International Cooperation Department D. Kamanin.

In the course of the event, the sides discussed issues concerning the development of scientific contacts among JINR, France, CERN, and the European Union. At the end of the negotiations, it was decided to expend every possible effort and make France an Associate Member of JINR. The sides also considered possible ways of integrating JINR into the Eurozone in the context of the existing research programmes. Professor M. Spiro noted that CERN is planning to increase the number of member states and expand the possibilities to cooperate and participate in the activities of CERN for the states outside the limits of the Eurozone. At the end of the event, the guests visited FLNR and VBLHEP, where they got acquainted with the heavy-ion accelerator complex and Nuclotron-M/NICA, one of the high-priority projects at JINR.

On 9–11 November, invited by Professor M. Budzynski, member of the JINR Scientific Council from Poland, Director of FLNP A. Belushkin and JINR Assistant Director G. Arzumanyan took part in the extended scientific seminar held at the Institute of Physics of the Maria Curie-Sklodowska University in Lublin under the guidance of Professor Z. Korczak, Director of the Institute of Physics. The seminar audience, which included chiefly students, postgraduates and young scientists, heard with interest the presentations by the guests from Dubna, gaining an insight into the history of JINR and its today's scientific policy, as well as into some of the promising avenues of research, associated, in particular, with the development of light spectroscopy methods and their use in biology and medicine. The JINR delegation, in its turn, got acquainted with the activities of the Institute of Physics and faculties of Lublin University.

From 9 to 11 November, a group of experts from Egypt, headed by the coordinator for cooperation Professor Hussein El Samman, was on a working visit to Dubna with the aim to elaborate a programme for joint work under the ARE–JINR Agreement. The guests visited all the laboratories of the Institute and discussed future joint projects in the Laboratories of Information Technologies, Neutron Physics, Nuclear Problems, and Radiation Biology. This visit became a key milestone in the preparation for the first session of the Joint Coordination Committee, which took place in Cairo at the end of November.

On 11 November, JINR was visited by a delegation from the Embassy of the United Kingdom in Moscow, including J. Knights, First Secretary, Science and Innovation Attaché, and M. Sokolova, Senior Advisor for Energy and Industry. The guests were welcomed by JINR Vice-Director R. Lednický, Chief Scientific Secretary N. Russakovich, Chief Engineer G. Shirkov, and Head of the International Cooperation Department D. Kamanin, who spoke about the key avenues of research at the Institute. During the event, the sides discussed possibilities for developing cooperation between JINR and the United Kingdom, particularly, with the John Adams Institute for Accelerator Science at Oxford. In order to provide a deeper insight into the cooperation issues, it was decided to organize a round-table discussion for scientists from the UK and Russia at JINR. The guests also visited VBLHEP and FLNR.

On 27 November, the House of Culture «Mir» hosted the events dedicated to the National Day of Romania. JINR Vice-Director Professor R. Lednický brought to recollection the names of outstanding Romanian scientists, who had pioneered research at JINR, and made a note of the successful development of collaboration between research centres in Romania and the Joint Institute. Strong approval of the cooperation was expressed by Doctor C. Mihail Grigorie, Ambassador Extraordinary and Plenipotentiary of Romania to RF, and Academician N. Victor Zamfir, Plenipotentiary of the Government of Romania to JINR.

G. Adam, leader of the Romanian team of researchers among the JINR staff, told about the history of this holiday, which started on 1 December 1918, when the unification of Romanians from Transylvania and Banat with the Kingdom of Romania brought about a new young state to the map of Europe, as well as of other historical facts. The Chamber Choir «Credo», MSU student A. Balasoiu, Choreographic Ensemble «Kalinka», and Vocal Ensemble «Metelitsa» arranged a performance for the guests of the event. Closing the festive evening was demonstration of short documentary films by Romanian filmmakers, which opened the Days of Romanian Cinema in Dubna.

In the same days, the HC «Mir» hosted an exhibition dedicated to the 400th anniversary of Galileo Galilei, organized by the Romanian artist and fine art expert K. Sigeti and Professor G. Stratan.

On 30 November, the first Joint Coordination Committee for the Joint Institute for Nuclear Research and Ministry of Higher Education and Scientific Research of the Arab Republic of Egypt started its work in the Academy for Science and Technology in Cairo. The primary objective of the Committee was to approve research projects carried out by scientific organizations of ARE in collaboration with JINR.

Professor Mahmoud Sakr, Vice-President of the Academy for Science and Technology, Professor Mahamed Ezzat Abd El-Azeem, Vice-President of the Egyptian Atomic Energy Authority, Professor Tarek Hussein from the University of Cairo, Professor Hussein El Samman from Minufiya University, and a number of experts took part in the work of the Committee from the Egyptian side. The JINR delegation included R. Lednický, D. Kamanin, E. Krasavin, S. Pakuliak, V. Ivanov, D. Kozlenko, E. Pryanichnikova, and I. Smirnova.

On 1 December, the JINR delegation visited the Institute for Metallurgical Studies in Tabbin, staff members of which have been successfully participating in the scientific projects of the Flerov Laboratory of Nuclear Reactions for a long time.

On 2 December, the JINR delegation was welcomed at the Egyptian Atomic Energy Authority (EAEA) by its President Professor Mohamed El-Kolaly, where the sides exchanged opinions on the arrangements to foster cooperation. Particularly, the discussion involved issues of organizing long-term visits to JINR laboratories for young Egyptian scientists to enable activities under the approved research projects. EAEA experts having an interest in cooperation with JINR took part in the discussion. At the end of the event, resolutions of the Coordination Committee, which gave a start to 14 joint projects, were signed.

On 14 December, Ambassador Extraordinary and Plenipotentiary of the Republic of South Africa to the Russian Federation M. Mpahlwa, accompanied by Science and Technology Attaché Doctor N. Arendse, was on a visit to JINR. The guests were welcomed by JINR Vice-Director R. Lednický, Chief Scientific Secretary N. Russakovich, Director of the University Centre S. Pakuliak, Head of the International Cooperation Department D. Kamanin, and Assistant Coordinator of Relations with the RSA A. Belova.

The Ambassador, who visited Dubna and JINR for the first time, was informed about the research at the Institute and results of collaboration with the RSA, including annual participation of groups of students from the RSA in practical training at JINR; organization by JINR lecturers of the theoretical part of the Winter School in Pretoria, held in cooperation with the South-African Institute of Physics (SAIP); eight sessions of

the Joint Coordination Committee, two working meetings on the development of scientific cooperation «Models and Methods in Few- and Many-Body Systems»; participation of JINR representatives in the sessions of the RF–RSA Intergovernmental Committee for Scientific Cooperation.

The guests from the RSA visited the IC-100 isochronous cyclotron at the Flerov Laboratory of Nuclear Reactions and the Complex for Beam Therapy at the Dzhelepov Laboratory of Nuclear Problems. The ambassador displayed interest to the innovative work carried out at the Institute and activities related to the special economic zone.

From 20 to 22 December, the 2nd Italy–Russia round-table meeting «Space Physics and Biology» was organized at the International Conference Hall under the support of the Ministry of Foreign Affairs of Italy, JINR, and RAS. Participating in the event were over 100 specialists in biology, biophysics, neurobiology, astrophysics, astronomy, and cosmology from JINR laboratories, universities, and research centres in Bologna, Moscow, Naples, Padua, Pisa, Pushchino, Rome, Trieste, Turin, and Florence.

A trilateral agreement on the cooperation among Italy, Russia, and JINR was signed at the closing session. Signatures to the documents were affixed by Professor G. Martinelli, Chairman of the INFN Committee, Rector of the SISSA University (Trieste, Italy), Academician A. Grigoriev, Vice-President of RAS, and Professor M. Itkis, Acting Director of JINR.

CONFERENCES AND MEETINGS HELD BY JINR

Eleven conferences were the largest among scientific conferences and workshops held at JINR in 2010.

On 25–30 January, the Laboratory of Information Technologies hosted the 17th international conference ***«Mathematics. Computer. Education»***. The conferences are organized on a regular basis annually in Dubna and Pushchino alternately, as the co-organizers of the conference are the interregional public organization «Women in Science and Education», JINR, Pushchino Scientific Centre for Biological Studies of RAS, Moscow State University, Scientific Council of RAS on biological physics, Keldysh Institute of Applied Mathematics of RAS, and University «Dubna». Traditionally, the conference programme, in line with plenary and sectional reports and presentations, included thematic round-table sessions «Cultural Environment of Russia. Books. Journals. Conferences. Internet», «Gender Problems in Life and Education», as well as «The Museum in the Modern World».

Over 350 attendants from Russia and CIS countries gathered in Dubna to discuss their professional topics and present-day problems in various areas of mathematics and education, in the sphere of applying information technologies, simulations of complex biological systems and economic processes. On the first day, the conference was attended by high-school teachers and pupils of Dubna lyceum No. 6 where the 12th interregional scientific and practical seminar «Synergetic Approach in Training and Education» took place.

The conference included the following sections: mathematical theories, computational methods and mathematical simulations, analysis of complex biological systems; experiment and models, mathematical methods in economy (econophysics), analysis and modelling of economic and social processes, humanitarian and natural-science education.

The conference participants listened to reports by famous JINR scientists. JINR Chief Scientific Secretary N. Russakovich presented the Scientific Programme of the JINR Development. Academician of the Russian Academy of Sciences D. Shirkov made his presentation «Nikolai Nikolaevich Bogoliubov's Scientific Heritage». LIT Director V. Ivanov spoke about the role of information technologies in the research underway at JINR, and LIT Deputy Director V. Korenkov delivered the report «Grid in the Modern World».

Among the speakers were Doctor of Economics V. Livshits (Central Economic Mathematical Institute of RAS), Doctor of Economics A. Varshavsky (CEMI), Doctor of Physics and Mathematics D. Chernavsky, Director of the Institute of Biochemical Physics of RAS, Head of the MSU Chemical Department S. Varfolomeev. The closing plenary report delivered by R. Pose (JINR) was dedicated to the centenary of M. Meshcheryakov's birth. Its title was «M. Meshcheryakov: To the Centenary of the Birth».

XIV Scientific Conference of JINR Young Scientists and Specialists was held in the first week of February. Its main topic was the NICA project which was discussed at the plenary meetings: the participants heard the news on the prospects for the physics of heavy-ion collisions and spin physics in the framework of this project, tasks and the status of the project «Nuclotron-M», the structure of the accelerator complexes NICA and RHIC, track detectors of the MPD/NICA facility, and other aspects of the project.

Young specialists reported about their research at eight section meetings, which were held in the afternoons.

The conference was attended by 129 young scientists and specialists. They presented 100 reports. The event turned out to be practically within the framework of the Institute — there were only two outside participants from SRINP MSU and PI RAS.

According to the delivered reports, the following laureates of the conference were:

— in the nomination «Scientific Theoretical Research»: T. Shneidman (the first prize), E. Uglov (the second prize), A. Andreev (the encouraging prize);

— in the nomination «Scientific Experimental Research»: D. Medvedev (the first prize), A. Lubashevsky (the second prize), E. Zemlyanichkina, E. Kuznetsova, O. Samoilov (the encouraging prizes);

— in the nomination «Scientific Methods and Techniques»: V. Zager, N. Anfimov, A. Isaev;

— in the nomination «Scientific and Technical Applied Research»: A. Rogachev, K. Panferov, O. Belov.

International Seminar on Interaction of Neutrons with Nuclei (ISINN-18), organized annually by the Frank Laboratory of Neutron Physics, was held from 26 to 29 May in the Scientific Research Institute of Nuclear Physics, MSU (NIIYaF). In 2010 it was dedicated to the 95th anniversary of the birthday of F. Shapiro, one of the founders and long-standing scientific leader of the Laboratory. More than a hundred people from leading nuclear physics centres of Russia — PINP and INR of RAS, IPPE, NIIYaF of MSU, the Radium Institute, CPTP Atomenergomash, and also from research institutes of Belarus, Bulgaria, China, Egypt, France, Germany, Republic of Korea, Romania, Serbia, Ukraine, the USA, and Switzerland participated in the work of the seminar.

The presented reports and posters included studies in the fields of fundamental properties of the neutron and fundamental symmetries, physics of ultracold neutrons, nuclear fission and nuclear structure, nuclear data for technology and nuclear analytical methods in life sciences, and related applications. The progress in creation and development of neutron sources in the Paul Scherrer Institute and the Laue–Langevin Institute, as well as in the research centre in Rossendorf, aroused great interest of the seminar participants.

The traditionally informal atmosphere of the seminar was favorable for the formation of new and strengthening the existing Russian and international collaborations.

An international conference ***«Distributed Computing and Grid Technologies in Science and Education»*** was held on 28 June – 3 July 2010 at the Laboratory of Information Technologies (LIT). The conference was devoted to the 80th anniversary of N. Govorun, an outstanding scientist, a Corresponding Member of the USSR Academy of Sciences, and a former Deputy Director and Director of the Laboratory of Computing Techniques and Automation.

Held by LIT under support of the Russian Foundation for Basic Research every two years, the conference was attended by 252 participants from Armenia, Belarus, Bulgaria, Czechia, France, Georgia, Germany, Greece, Hungary, Iceland, Kazakhstan, Moldova, Myanmar, Poland, Romania, Russia, Sweden, Switzerland, Ukraine, the USA, and Uzbekistan, as well as from CERN and JINR. Russia was represented by participants from 56 universities and research centres.

The conference included 8 sections: WLCG (Worldwide LHC Computing Grid), grid applications, grid in business, distributed computing and grid technologies in education, GridNNN (Grid of the National Nanotechnology Network), methods and algorithms for distributed computing, grid infrastructure, and «cloud» computing. In the framework of the conference, round-table discussions were organized on using grid technologies in business and training in grid technologies and their application in education. A training course was held on the topic «Integrated Infrastructure, Tools and Methods for Support of the Scientific Applications Development in Grid and Systems of Voluntary Distributed Computing».

First reports on the national grid projects and on specific targets which are solved on these grid infrastructures were presented to the conference attendees. The activities on the creation of a grid system for the Russian national nanotechnology network GridNNN should be especially noted. The reports on this project were delivered at a special section. They attracted interest of numerous Russian and foreign participants.

Plenary reports of the second conference day were traditionally devoted to the issues of organization and functioning of grid infrastructures in various organizations and countries. Current state and results of the activities of the JINR grid segment were reported by V. Korenkov, LIT Deputy Director.

Status plenary reports were presented by G. Shabratova (JINR, on behalf of ALICE), «The ALICE GRID Operation», and by P. Kreuzer (CERN, for the CMS Computing Project), «Experience with CMS Computing in the Grid since the Start of the LHC Data Taking», where the main attention was focused on particular results on the analysis of experimental data obtained at the accelerator start-up. A.Vaniachine (ATLAS, Argonne National Laboratory, the USA) reviewed applications of databases within the grid infrastructures for LHC experiments and suggested a number of approaches to the development and more effective utilization of relational database technologies for the LHC experiments.

A section of grid applications was very representative. A lot of reports covered the issues of the development of specialized interfaces for users that facilitate access to specific applied environments and tasks.

On 23 August the international workshop ***«Critical Point and Onset of Deconfinement» (CPOD-2010)*** started its work in the conference hall of the Bogoliubov Laboratory of Theoretical Physics. About 120 scientists from various countries of the world who do research in the field of heavy-ion physics and about 60 students attending the international school «Dense QCD States in Heavy-Ion Collisions» held at BLTP took part in the workshop.

Chairman of the Organizing Committee Professor A. Sorin opened the workshop. JINR Vice-Director Professor R. Lednický, BLTP Director Professor V. Voronov, VBLHEP Director Professor V. Kekelidze, and Scientific Secretary of the Organizing Committee Professor D. Blaschke greeted the participants.

One of the central issues at the workshop was the NICA project as a most important one in the seven-year programme of the development of JINR. All laboratories of the Institute represented at the workshop are involved in this project. There were many reports on the status of the project, the MPD detector, development of the Nuclotron, etc. These issues were discussed in more detail on 28 August at the round-table session «Physics at NICA» that concluded the workshop programme.

On 17 September, the date of the ***centenary of the birthday of Mikhail Grigorievich Meshcheryakov***, a ceremony was held in the park of the Volga embankment to inaugurate a monument to the scientific leader of the development and launching of the synchrocyclotron, one of the city founders, and director of the Institute of Nuclear Problems of the USSR AS.

Opening the event, JINR Acting Director M. Itkis noted that among the prominent figures of our Institute M. Meshcheryakov occupied a special place. He took charge of the work of the synchrocyclotron construction when he was quite a young man. It took him a little more than 2 years to construct and launch the accelerator. Actually, Dubna itself started its history with the development of this facility, which remained the largest in the world up to 1953, and the organization of a laboratory on its basis. M. Itkis said, «He was an outstanding extraordinary person. It was interesting to listen to him at the sessions of the JINR Scientific Council. I am glad that the Institute and the city chose this place and refined it erecting the monument here to commemorate the man who in fact founded the city».

The city Mayor V. Prokh said that one more project had been implemented together with JINR and the long work had been completed: «Mikhail Grigorievich loved the Volga very much. We tried hard to make the embankment more picturesque. We are very grateful to those who put their hearts into this place. Mikhail Grigorievich will enjoy the scenery of the Volga River together with us!»

S. Nurushev (IHEP, Protvino) expressed his gratitude to Dubna citizens. He got acquainted with M. Meshcheryakov in Dubna in 1953. He said, «This meeting changed my life. I am tremendously obliged to him. For me, an orphan, he was like a father. He encouraged and supported me in science and in personal life. Mikhail Grigorievich always treated all problems of his staff members very attentively and helped us».

M. Meshcheryakov's niece G. Meshcheryakova said, though it took her an effort to control her emotions, «Science was the goal of all life of Mikhail Grigorievich. He always wanted to do his best and to be the first in the world. Thank you for your consideration!»

After the inauguration the ceremony moved to the JINR Laboratory of Information Technologies where a historic memorial seminar was held. M. Meshcheryakov was the organizer and the first director of this laboratory (1966–1988), called at the time the Laboratory of Computing Techniques and Automation. The programme of the memorial seminar was compiled not only to commemorate the founder of the laboratory, but also to speak about the development of the laboratory and its landmarks, evolution of accelerator technology at the Joint Institute. In conclusion of the seminar, a full-length documentary «M. G.'s High Energy» was demonstrated. The film was produced by JINR and the «Dubna» TV channel.

On 4–9 October XX Baldin international seminar on problems in high energy physics ***«Relativistic Nuclear Physics and Quantum Chromodynamics»*** was held at the BLTP conference hall. Scientists from about 15 countries took part in it, including researchers from Germany, the USA, France, Japan, and leading Russian physics centres.

In 1969 Academician A. Baldin initiated this series of seminars as he started a new scientific trend at the time — the relativistic nuclear physics. For three decades he headed the Organizing Committee of the seminars, where one of the main topics gradually became the new trend. Later, these seminars, held every two years, were unofficially called Baldin Autumn.

JINR Acting Director Professor M. Itkis, BLTP JINR Director Professor V. Voronov, Co-Chairmen of the Organizing Committee Professors V. Burov and A. Malakhov spoke at the opening of the seminar.

Most topical problems in relativistic nuclear physics and quantum chromodynamics were discussed at the seminar. In connection with the start of research at the LHC in CERN, reports were made about the experiments and first results. There were also reports on the activities at the Nuclotron, on the project NICA and other projects in scientific centres of the world where Dubna scientists take part — at the RHIC collider at BNL, in FNAL at the Tevatron, and many others. Beside fundamental trends of research, the seminar programme included aspects of applications of relativistic nuclei. At a special section, reports were made about research connected with transmu-

tation of radioactive waste in nuclear energy industry, in safe nuclear energy, studies of biological action of space radiation, medical applications, such as therapy of oncological diseases with carbon relativistic nuclei.

On 9–14 October, the 3rd international conference ***«Modern Problems in Genetics, Radiobiology, Radioecology and Evolution»*** (http://wwwinfo.jinr.ru/drrr/Timofeeff / Alushta / Menu / MenuSet_10.htm) was held in the holiday hotel «Dubna» (Alushta, Ukraine). It was dedicated to the memory of N. Timofeeff-Ressovsky, V. Korogodin, and V. Shevchenko. The conference was held by JINR with the support of RFBR and the NATO Scientific Programme; it was attended by leading scientists and specialists from scientific centres of Russia, Belarus, the USA, Germany, Canada, Italy, and other countries.

The main topics of lectures and presentations in the genetics section were genetic mechanisms, the mutation process, protein transfer of heredity, and epigenetics. The programme of the radiobiological section was very rich. The main topics were non-target effects at various organization levels and chromosome instability. Issues of population sensitivity to radiation and combined action, efficiency of counter measures in contaminated territories, and radionuclide migration in ecosystems were discussed at the radioecology section. The section «Evolution» was of special interest. On the commemorative day of the conference, reports were made about N. Timofeeff-Ressovsky, V. Korogodin, and V. Shevchenko. The medals «Biosphere and Mankind», «The Phenomenon of Life», and «For Achievements in Radiation Genetics» instituted in memory of these scientists for their outstanding contribution to science were awarded to S. Rosenberg (USA), M. Durante (Germany), V. Zhestyannikov (Russia), M. Reznik (USA), and T. Hinton (France). Young scientists took part in the conference. Many of them made their first presentations at such an international symposium. They managed to advocate their opinions in discussions with experienced colleagues from other countries.

In the framework of the conference a round-table discussion was organized on the topic «Problems in the Crimea Ecology». Scientists from Tavria University, an ecological centre, the Karadag reserve, the Nikitsky Botanical Garden, the Institute of South Seas Biology, and members of the government of the Autonomous Republic of Crimea took part in its meeting. The reports presented at the discussion concerned problems in the ecology of the Crimea and the Karadag reserve. The participants of the conference and the round-table discussion adopted a resolution to recommend that the National Academy of Sciences of Ukraine and the board «The Man and the Biosphere, UNESCO» nominate the Karadag Nature Reserve of NAS of Ukraine to be enlisted into the UNESCO World Heritage.

The conference finished with fascinating excursions to the Karadag reserve and the Nikitsky Botanical Garden.

On 14 October, an ***Advanced Scientific Seminar on High Energy Physics*** was held at the JINR International Conference Hall. It was dedicated to the memory of Academician Alexei Norairovich Sissakian (14.10.1944–01.05.2010), JINR Director in 2005–2010.

The participants of the seminar — friends, colleagues of the scientist, leading physicists of JINR and its Member States — presented scientific reports on modern trends of research and reminiscences about bright milestones of the scientific and creative career of A. Sissakian.

JINR Acting Director Professor M. Itkis opened the seminar. He spoke about the outstanding personality of Academician A. Sissakian as a scientist, science organizer, teacher and a person of the modern epoch. M. Itkis also presented a report-address «The Speech about Alexei Sissakian» written by Academician V. Kadyshevsky, who was away at the time. On behalf of the Moscow Region government, Deputy Minister of Industry and Science N. Kiselev greeted the participants of the seminar and handed the RF President's grant to the young staff member of JINR BLTP A. Zubov.

The following scientists took the floor: Academician-Secretary of the Department of Physical Sciences of RAS, INR RAS Director V. Matveev, JINR Vice-Director R. Lednický, Deputy Director of MSU SRINP V. Savrin, Professor J.-P. Delahaye (CERN), DLNP Director A. Olshevsky, CP Chairman S. Dubnička (Slovakia), FLNP Scientific Leader V. Aksenov, VBLHEP Director V. Kekelidze, BLTP Deputy Director A. Sorin, Professors G. Zinoviev (Kiev), Yu. Budagov, G. Pogosyan (Yerevan), and Rector of Dubna University D. Fursaev.

In conclusion, a documentary «Friendship, Creativity, Remembrance. Academician Alexei Sissakian» was shown. It was made by a group «RAN-Video», written and produced by Eh. Vlasova.

On 20–21 October the 13th conference ***«Science. Philisophy. Religion»*** was held at the JINR International Conference Hall on the topic «Facing the Cutting-Edge Biomedical Technology». The conference was organized by JINR, the Moscow School of Theology, the Foundation of Saint Andrew the-First Called and the Centre of the National Glory with participation of the Lomonosov MSU and the Institute of Philosophy of RAS. The tradition of this conference goes back to the early 1960s, when regular meetings of philosophers and physicists were held in Dubna under the chairmanship of D. Blokhintsev. The first conference «Science. Philosophy. Religion», held in 1990, was initiated by Professor V. Pervushin (BLTP) and V. Nikitin (VBLHEP); it was dedicated to the notion of truth in science and religion.

Among the participants of the conference were famous scientists, theologists, and religious figures. Speeches, reports, and discussions covered a wide range of issues related to moral, spiritual, and social aftermaths of the development of modern biomedical technology. The detailed report with abstracts of all presentations can be found at the site of the Moscow Orthodox School of Theology http://www.mpda.ru/news/text/283205.html

From 20 to 23 October, the ***International Symposium on In Situ Nuclear Metrology as a Tool for Radioecology (INSINUME-2010)*** was held in Dubna. It gathered specialists from universities, research centres, and organizations that deal with studies of contamination of various ecosystems with radionuclides.

Such symposia were initiated by the Belgian National Institute of Radioelements. They consider modern tools for nuclear metrology and their application to facilitate the direct control of radiological conditions of seas, rivers, lakes, and ground surface, and to assist the community that tackles the issues of radiological protection of the environment in improving the real radiological monitoring in future. Since the first conference of this series in Belgium, the symposia have been held in the Western, Central and Eastern Europe, Asia, and Africa.

Reports and poster presentations at the symposium'2010 in Dubna were delivered by scientists from Belgium, Bulgaria, Canada, Czechia, Egypt, Germany, Greece, Iran, Kazakhstan, the Netherlands, Norway, Poland, RSA, Russia, Serbia, Slovakia, Turkey, Ukraine, the USA, and JINR staff members. The event was dedicated to new technologies and methods of radionuclide measurements *in situ* and in laboratory conditions; radionuclide transfer; control of crises caused by nuclear disasters in the environment, including social and economic aspects; safety standards for radiation protection of population and environment; development of national and international data bases; and disposal of nuclear and non-nuclear wastes.

PARTICIPATION OF JINR IN INTERNATIONAL CONFERENCES

In 2010, JINR scientists and specialists participated in 231 international conferences.

The largest delegations representing JINR attended the following events: the NEMO Workshop (Prague, Czechia); the 5th international conference «Beyond the Standard Model of Particle Physics, Cosmology and Astrophysics» (Beyond 2010) (Cape Town, South Africa); the meeting «Physics for Health in Europe» (Geneva, Switzerland); the GRANIT 2010 Workshop (Les Ouches, France); the NuSTAR Annual Meeting (Darmstadt, Germany); the PANDA Workshop (Darmstadt, Germany); the 19th Meeting of the International Collaboration on Advanced Neutron Sources (ICANS XIX) (Grindelwald, Switzerland); the 44th Winter School of the Petersburg Institute of Nuclear Physics on Condensed Matter Physics (Roshchino, Russia); the HADES Workshop (Darmstadt, Germany); the annual conference «Siemens PLM Connection 2010» (Moscow, Russia); the international meeting «Young Scientists Contribution to the FAIR Project» (Moscow, Russia); the 15th Workshop on the CBM Collaboration (Darmstadt, Germany); the 9th Conference of Young Scientists, Specialists and Students at the Institute of Medical and Biological Problems (Moscow, Russia); the 16th Radiochemical Conference (Marianske Lazne, Czechia); the International Conference on Nuclear Data for Science and Technology (ND 2010) (Jeju, the Republic of Korea); the 15th Seminar on Condensed Matter Research with Neutron Scattering (Poznan, Poland); the International Conference on Particle Accelerators (Kyoto, Japan); the 2nd workshop «State of the Art in Nuclear Cluster Physics» (SOTANCH2) (Brussels, Belgium); the workshop «Physics at the LHC 2010» (Hamburg, Germany); the 3rd international conference «Current Problems in Nuclear Physics and Atomic Energy» (NPAE-Kyiv 2010) (Kiev, Ukraine); the International Workshop on Production of Mesons, Their Properties and Interactions (MESON 2010) (Cracow, Poland); the 24th International Conference on Neutrino Physics and Astrophysics (Neutrino 2010) (Athens, Greece); the PANDA Workshop (Stockholm, Sweden); the 29th International Workshop on Nuclear Theory (Govedartsi, Bulgaria); the 4th Joint Meeting of the Asian-Pacific Centre for Theoretical Physics (APCTP) and the Bogoliubov Laboratory of Theoretical Physics, JINR (Pohang, the Republic of Korea); the international conference «Modern Problems of Gravitation, Cosmology and Relativistic Astrophysics» (Moscow, Russia); the all-Russian youth innovation forum «Seliger-2010» (Ostashkov, Russia); the 8th International Workshop on Polarized Neutrons in Condensed Matter Investigations (PNCMI 2010) (Delft, the Netherlands); the international conference «Hadron Structure and Quantum Chromodynamics» (HSQCD 2010) (Gatchina, Russia); the 60th workshop on nuclear spectroscopy and nucleus structure «Nucleus-2010. Nuclear Physics Methods for Femto- and Nanotechnologies» (Petergof, Russia); the 35th International Conference on High Energy Physics (ICHEP 2010) (Paris, France); the 3rd International Conference on Frontiers in Nuclear Structure, Astrophysics and Reactions (Rhodos, Greece); the 21st European Conference on Few-Body Problems in Physics (EFB 2010) (Salamanca, Spain);

the 9th International Conference on Quark Confinement and Hadron Spectrum (Madrid, Spain); Zakopane Conference on Nuclear Physics (Zakopane, Poland); the 17th European School on Exotic Beams (Santiago de Compostela, Spain); the 38th Annual Meeting of the European Radiation Research Society (Stockholm, Sweden); the 19th International Conference on Cyclotrons and Their Applications (Cyclotrons'10) (Lanzhou, China); the Russian seminar «Non-Linear Fields and Relativistic Statistics in Theory of Gravitation and Cosmology» and the Russian summer school «Mathematical Modelling of Fundamental Objects and Phenomena in Computer Mathematics Systems» (Kazan–Yalchik, Russia); the 6th Workshop on Particle Correlations and Femtoscopy (WPCF-2010) (Kiev, Ukraine); the 21st Congress of Pavlov Physiology Society (Kaluga, Russia); the 55th Annual Conference of the South-African Institute of Physics (Pretoria, South Africa); the 19th International Spin Physics Symposium (SPIN2010) (Julich, Germany); the ISTC–CERN–JINR Summer School on High Energy and Accelerator Physics (Astana, Kazakhstan); the 22nd Russian Conference on Charged Particle Accelerators (RuPAC-2010) (Protvino, Russia); the 16th CBM Collaboration Meeting (Mamaia, Romania); the international youth school «Modern Fundamental, Medical and Biotechnological Aspects of Biological Membranes Research» (Dolgoprudny, Russia); the all-Russian scientific conference «Membranes-2010» («Klyazma» holiday hotel, Russia); the 12th all-Russian conference «Digital Libraries: Perspective Methods and Technologies, Digital Collections» (RCDL'2010) (Kazan, Russia); the 3rd international conference «Models of Quantum Field Theory» (MQFT-2010) (St. Petersburg, Russia); the 1st Joint ILC and CLIC International Workshop (Geneva, Switzerland); the 6th Congress on Radiation Research (Radiobiology, Radioecology, Radiation Safety) (Moscow, Russia); the International Workshop on Nuclear Analytical Techniques and Applications (Bucharest, Romania); the international symposium «Quasifission Process in Heavy Ion Reactions» (Messina, Italy), the 21st Workshop on the Use of Neutron Scattering in Condensed Matter Research (NSCMR-2010) (Moscow, Russia); the conference «Scintillation Materials Engineering and Radiation Technologies» (SMERT-2010) (Kharkov, Ukraine); the international conference «New Achievements in Nuclear Physics» (Goa, India).

DEVELOPMENT OF THE JINR INTERNATIONAL COLLABORATION AND RELATIONS DURING THE YEARS 1990–2010

	1990	1995	2000	2005	2007	2008	2009	2010
1. Number of short-term visits to JINR by specialists from Member States (not counting Russian specialists)	1050	299	425	339	862	888	856	310
2. Number of visits by JINR specialists to Member States	778	682	682	927	921	691	838	797
3. Number of conferences organized by JINR	44	52	54	65	62	60	69	78
4. Number of visits to international conferences and research centres of non-Member States	437	1451	1946	2150	2052	1745	1702	2141
5. Number of visits of scientists from non-Member States	563	1036	990	733	809	726	847	810
6. Number of JINR fellows	16	28	17	21	19	14	10	13

LIST OF CONFERENCES AND MEETINGS HELD BY JINR IN 2010*

No.	Name	Place	Date	Number of participants
1.	Meeting of the Machine Advisory Committee on the Nuclotron-M–NICA Project	Dubna	12–13 January	13
2.	Meeting of the Programme Advisory Committee for Particle Physics	Dubna	14–15 January	58
3.	Meeting of the Programme Advisory Committee for Condensed Matter Physics	Dubna	18–19 January	60
4.	Meeting of the Programme Advisory Committee for Nuclear Physics	Dubna	25–26 January	71

*A number of conferences were held jointly with other organizations.

No.	Name	Place	Date	Number of participants
5.	17th international conference «Mathematics, Computer, Education»	Dubna	25–30 January	380
6.	8th Winter School on Theoretical Physics	Dubna	31 January – 7 February	68
7.	14th Scientific Conference of JINR Young Scientists and Specialists	Dubna	1–6 February	129
8.	107th Session of the JINR Scientific Council	Dubna	18–19 February	89
9.	20th Meeting of the Steering Committee for the BMBF–JINR Agreement Implementation	Dubna	22–23 February	20
10.	1st Coordination Meeting on the Programme of Serbia–JINR Collaboration «Solid State Physics with Ion Beams»	Dubna	25–27 February	23
11.	Conference on Problems of CIS Cooperation in Innovation Area	Dubna	3–4 March	39
12.	Meeting of the JINR Finance Committee	Dubna	22–23 March	49
13.	Session of the Committee of Plenipotentiaries of the Governments of the JINR Member States	Dubna	25–26 March	56
14.	All-Institute seminar «Physics at LHC»	Dubna	30 March	
15.	14th research workshop «Nucleation Theory and Applications»	Dubna	1–30 April	57
16.	School (practice) for students of the Lyublin University «Radiobiological Protection and Nuclear Security»	Dubna	11–18 April	29
17.	MEPI's 11th Department Meeting in Dubna	Dubna	16 April	30
18.	Extraordinary Session of the Committee of Plenipotentiaries of the Governments of the JINR Member States	Dubna	7 May	25
19.	3rd JINR–Bulgaria Spring School	Bachinovo, Bulgaria	10–15 May	105
20.	ATLAS Collaboration Workshop on Charged Boson Physics	Dubna	11–13 May	37
21.	School (Practice) for Students from the Arab Republic of Egypt	Dubna	17 May – 6 June	37
22.	Conference «Small and Middle-Sized Innovative Enterprises. Opportunities and Barriers to Development»	Dubna	21–22 May	47
23.	18th International Seminar on Interaction of Neutrons with Nuclei	Dubna	26–29 May	100
24.	International workshop «New Perspectives of Cooperation with JINR: From Physics of Elementary Particles to Nanotechnologies»	Ulaanbaatar, Mongolia	31 May – 6 June	48
25.	Workshop of the BAIKAL Collaboration	Dubna	1–4 June	56
26.	Meeting of the JINR Scientific and Technical Council	Dubna	7 June	47
27.	2nd Workshop of the Helmholtz Society–Russia Joint Research Group Dedicated to the Problem of High Energy Cooling	Dubna	10–11 June	25
28.	Meeting of the Programme Advisory Committee for Nuclear Physics	Dubna	17–19 June	67
29.	19th international colloquium «Integrable Systems and Quantum Symmetries»	Prague, Czechia	17–19 June	70

No.	Name	Place	Date	Number of participants
30.	Practice at JINR for Pupils and Teachers of Polish Schools	Dubna	19–29 June	13
31.	European School on High-Energy Physics	Raseborg, Finland	20 June – 3 July	130
32.	Meeting of the Programme Advisory Committee for Particle Physics	Dubna	21–22 June	50
33.	Meeting of the Programme Advisory Committee for Condensed Matter Physics	Dubna	24–25 June	60
34.	Bilateral JINR–the People's Republic of China Workshop on Nuclear Physics	Dubna	28 June – 4 July	40
35.	4th international conference «Distributed Computations and Grid Technologies in Science and Education»	Dubna	28 June – 3 July	251
36.	Workshop on DVIN Project	Dubna	1 July	50
37.	3rd CIS Advanced Courses in Nanotechnologies	Dubna	4–10 July	56
38.	School for Teachers of Physics from JINR Member Countries	Dubna	4–10 July	63
39.	International conference «Dubna-NANO 2010»	Dubna	5–10 July	144
40.	2010 Student Practice in JINR Fields of Research	Dubna	5–25 July	111
41.	Baikal Summer School on Physics of Elementary Particles and Astrophysics (Baikal Summer JINR–Irkutsk State University School)	Bolshie Koty, Russia	6–14 July	70
42.	Workshop on Straw Detector for NA-62 Experiment	Dubna	6–9 July	15
43.	International seminar «Actual Problems of Modern Neutrino Physics» in memory of Professor Ts. Vylov	Dubna	13 July	50
44.	Advanced Studies Institute «Symmetries and Spin»	Prague, Czechia	18–25 July	79
45.	International conference «Methods of Symmetry in Physics»	Tsakhkadzor, Armenia	16–21 August	48
46.	International school «Dense QCD Phases in Heavy-Ion Collisions»	Dubna	21 August – 4 September	80
47.	6th international workshop «Critical Point and Onset of Deconfinement» (CPOD-2010)	Dubna	23–29 August	100
48.	International Advanced School on Modern Mathematical Physics	Dubna	5–15 September	60
49.	2010 Practice for South African Students at JINR	Dubna	5–26 September	51
50.	4th Sissakian Readings «Problems of Biochemistry, Radiation and Space Biology»	Alushta, Ukraine	5–9 September	33
51.	14th Annual RDMS CMS Collaboration Conference	Varna, Bulgaria	6–10 September	60
52.	ELAN (ATLAS) and SANC Joint Workshop	Dubna	7–10 September	21
53.	2nd South Africa–JINR symposium «Models and Methods in Few- and Many-Body Systems»	Dubna	8–10 September	36
54.	Scientific and Historical Memorial Seminar Dedicated to M. Meshcheryakov's 100th Anniversary	Dubna	16–17 September	120
55.	International workshop «Bogoliubov Readings»	Dubna	22–25 September	63
56.	108th Session of the JINR Scientific Council	Dubna	23–24 September	92
57.	4th international workshop «Molecular Simulation Studies in Material and Biological Sciences» (MSSMBS'10)	Dubna	26–29 September	39

No.	Name	Place	Date	Number of participants
58.	4th International Bruno Pontecorvo School on Neutrino Physics	Alushta, Ukraine	26 September – 6 October	50
59.	Meeting of the Machine Advisory Committee on Nuclotron-M–NICA Project	Dubna	4–5 October	12
60.	20th Baldin international seminar on high energy physics problems «Relativistic Nuclear Physics and Quantum Chromodynamics»	Dubna	4–9 October	172
61.	3rd international conference «Modern Problems of Genetics, Radiobiology, Radioecology and Evolution» in memory of N. Timofeeff-Ressovsky; 3rd Readings after V. Korogodin and V. Shevchenko; Workshop on the NATO Program «Radiobiological Issues Pertaining to Environmental Security and Ecoterrorism»	Alushta, Ukraine	9–14 October	110
62.	Advanced Seminar on High Energy Physics in Memory of A. Sissakian	Dubna	14 October	120
63.	Workshop «Nuclear Structure: Recent Developments» dedicated to the 85th birthday of Professor V. Soloviev	Dubna	14–16 October	54
64.	13th international conference «Science. Philosophy. Religion»	Dubna	20–21 October	121
65.	International Symposium on In Situ Nuclear Metrology as a Tool for Radioecology (INSINUME-2010)	Dubna	20–23 October	112
66.	ATLAS Collaboration Meeting	Dubna	22–25 October	38
67.	NEMO-3/SuperNemo Collaboration Meeting	Dubna	25–28 October	65
68.	School on JINR/CERN Grid and Management Information Systems	Dubna	25–29 October	60
69.	All-Russian school «Modern Neutronography: Fundamental and Applied Research of Functional and Nanostructured Materials»	Dubna	25 October – 2 November	54
70.	2nd Dubna youth scientific school «Management of Innovations»	Dubna	29 October – 3 November	71
71.	School for young scientists of Russia «Instruments and Methods of Experimental Nuclear Physics. Electronics and Automatics of Experimental Facilities»	Dubna	11–13 November	90
72.	IBA Management Team Meeting	Dubna	22–24 November	19
73.	Meeting of the JINR Finance Committee	Dubna	23–24 November	51
74.	Session of the Committee of Plenipotentiaries of the Governments of the JINR Member States	Dubna	26–27 November	110
75.	Training Course for Young Scientists from CIS Countries	Dubna	1–25 December	39
76.	Workshop of the BAIKAL Collaboration	Dubna	7–10 December	56
77.	Advanced Scientific Seminar on Modern Problems of Physics of Elementary Particles and Cosmology in Memory of Academician A. Tavkhelidze	Dubna	16–17 December	71
78.	2nd conference «Italy–Russia Round-Table Meeting in Dubna: Space Physics and Biology»	Dubna	19–22 December	110