

**I. General considerations**

The Scientific Council takes note of the comprehensive report presented by JINR Director A. Sissakian on the implementation of the recommendations made at the 104th session of the Scientific Council, on the plans of JINR's activity for 2009, and on the JINR mid-term development strategy in line with the Institute's road map.

The Scientific Council is pleased to note that most of its recommendations to the JINR Directorate concerning the current and long-term scientific programmes of JINR, the operation and upgrade of the basic facilities, and the construction of new facilities are being implemented.

The Scientific Council recognizes the significant scientific accomplishments of JINR scientists in 2008 in the fields of particle physics, nuclear physics, and condensed matter physics, as well as the progress in the areas of information technology, innovative developments and educational activities. The Scientific Council highly appreciates the valuable contributions to the advancement of science and technology in a world view that have been achieved as part of the JINR programme.

As one example, the Scientific Council highly appreciates the recent advances made at JINR in understanding the chemistry of superheavy elements (element 114), and looks forward at a future meeting to presentation of a comprehensive plan concerning how JINR scientists will develop the necessary capability to ultimately reach the island of stability.

The Scientific Council welcomes the efforts by the JINR Directorate to prepare a comprehensive plan for the development of JINR for 2010–2016 in view of the completion, this year, of the current seven-year "Programme of the Scientific Research and Development of JINR". The Scientific Council supports the milestones of the mid-term development strategy, which the Institute will strive to achieve during the next seven-year period of its activity in 2010–2016, outlined in the report by Director A. Sissakian.

The Scientific Council notes with satisfaction the decision of the Committee of Plenipotentiaries, taken at its session in November 2008, to increase the JINR budget by 22.8% in 2009, as well as information about the planned increase of the average salary of the Institute staff in April 2009, presented by Director A. Sissakian.

The Scientific Council notes that the Committee of Plenipotentiaries also reiterated its previous decision to address the governments of the Member States with a proposal to make provisions for an increase of the JINR budget in 2011–2015 (tentatively 2.5 times by the year 2015 relative to the level of the year 2010) with a view to creating an in-house facility base attractive to the Member States and the world scientific community. These

facilities will include the Nuclotron-M and NICA/MPD, a third-generation DRIBs facility (DRIBs-III), and a complex of state-of-the-art neutron spectrometers for the modernized reactor IBR-2M.

The Scientific Council notes the importance of the general agreement, signed in February 2009, between JINR and the Russian Research Centre “Kurchatov Institute” on further development of cooperation in the areas of basic and applied research, education, and innovations, and of the trilateral agreement between JINR, the Kurchatov Institute, and the International Association of Academies of Sciences concerning their participation in the establishment of an International Innovation Centre for Nanotechnology of the CIS countries.

The Scientific Council takes note of the information, requested at the previous session, about the rules for the associate membership in JINR and about the efforts being taken by the JINR Directorate towards conclusion of government-level agreements with new Associate Member States of the Institute. The Scientific Council highly appreciates this work and looks forward to its active continuation.

The centenary of the birth of N. Bogoliubov, an outstanding scholar of the 20th century and former Director of JINR for many years, will occur on 21 August 2009. The Scientific Council takes note of the activities planned by JINR to commemorate this date.

The Scientific Council congratulates Professor D. Shirkov, Honorary Director of the Bogoliubov Laboratory of Theoretical Physics, on the award of the Order of Merit for the Fatherland, in recognition of his outstanding contributions to theoretical physics and to the education of young scientists, presented at this session.

## **II. Award of the title “Honorary Doctor of JINR”**

The Scientific Council endorses the JINR Directorate’s proposal to award the title “Honorary Doctor of JINR” to Professors B. Chadraa (Mongolia) and V. Moskalenko (Moldova), in recognition of their outstanding contributions to the advancement of science and the education of young scientists. The Scientific Council congratulates Professors B. Chadraa and V. Moskalenko on these highly significant achievements.

## **III. Considerations concerning the next seven-year scientific programme**

In line with the recommendations of the Scientific Council, the JINR Directorate is preparing the first draft of the seven-year plan for JINR development for 2010–2016.

The Scientific Council takes note of the reports with proposals for this plan in the fields of particle physics, nuclear physics and condensed matter physics, presented by

Vice-Directors R. Lednický and M. Itkis, and concerning the development of the engineering infrastructure, presented by Chief Engineer G. Shirkov.

The Scientific Council considers the above draft to be a good foundation for the comprehensive programme of JINR's development, clearly emphasizing the future of the Institute as a world-class laboratory in selected fields of research, relying on its own basic facilities, and recommends that the Committee of Plenipotentiaries approve the general lines of the presented draft plan at its next session in March 2009. As part of this development, consideration of the future evolution and streamlining of the laboratory structure of the Institute to optimize the impact of the scientific programme should be also carried out.

The Scientific Council notes that realizing the projected increase in budget presented by A. Sissakian will be crucial for the success of the seven-year plan for JINR development in 2010–2016 and underscores the importance of the decision taken by the Committee of Plenipotentiaries at its session in November 2008 on the annual increase of the JINR budget. It notes as a result of this decision that the total volume of financial resources envisioned by the approved budget forecast for the years 2011–2015 may be sufficient to ensure modernization of the existing basic facilities and construction of new facilities in accordance with the main lines of the draft plan for JINR development for the next seven-year period. However, it strongly encourages the Directorate, together with the Laboratory Directors, to develop, internal to the Institute, a contingency plan, including prioritization of proposed activities, addressing the possibility that the full level of funding may be delayed compared to the projection presented by A. Sissakian.

The Scientific Council notes that in addition to adequate funding to realize the future seven-year plan, an essential requirement will be the availability of an adequate number of young scientists and technical specialists. It encourages the JINR Directorate to help insure that conditions exist at the Joint Institute that will be attractive to young scientists and technical specialists who will comprise the future JINR workforce. The Scientific Council also notes that a comprehensive accounting of the users and students would help underscore the importance of the JINR scientific programmes for educating the next generation of young scientists from the Member States.

The Scientific Council looks forward to a presentation at its next meeting of a coherent all-institute strategy regarding the future of hadron therapy at JINR which addresses the ongoing treatment programme at DLNP, the hadron therapy research and development programme with carbon beams at VBLHEP, and a possible future treatment

centre external to JINR. The resulting all-institute strategy should articulate the relationship and synergies between the efforts at DLNP, VBLHEP, and other laboratories.

The Scientific Council looks forward to receiving written materials on the seven-year plan well in advance of its next session in September 2009. It notes that an Institutional Plan document of this type will be very useful for highlighting, for the representatives of the Member States, the compelling scientific opportunities provided by the future seven-year programme at JINR.

The Scientific Council takes note of the progress report on the preparation of the NICA/MPD project, presented by VBLHEP Acting Director V. Kekelidze.

The Scientific Council is pleased to note the significant progress in the preparation of the NICA Technical Design Report and the MPD Conceptual Design Report, the efforts towards concentration of VBLHEP resources on this activity, as well as the active use of world experience accumulated in this field of accelerator and detector engineering.

The Scientific Council recognizes the present effort to internationalize the construction and the scientific programme of Nuclotron-M/NICA and strongly encourages continued vigorous effort in this direction.

The Scientific Council agrees with the PAC for Particle Physics that a draft white paper which clearly articulates the compelling physics programme possible with the NICA/MPD facility must be prepared in 2009, and recommends in the strongest terms that this document serve as the basis for an in-depth, in-person review by an international panel of world-recognized experts in the areas of scientific endeavor proposed to be studied at NICA/MPD (relativistic nucleus-nucleus physics, spin physics, etc.)

#### **IV. Recommendations in connection with the PACs**

The Scientific Council concurs with the recommendations made by the PACs at their January 2009 meetings as reported at this session by Professors J. Nassalski, W. Greiner, and V. Kantser.

##### Particle Physics Issues

The Scientific Council endorses the main lines of the JINR Programme of Particle and Relativistic Nuclear Physics Research proposed by the laboratories for the period 2009–2011 in accordance with the main provisions of the updated road map. The main scientific emphasis in the seven-year plan should be the future development of the in-house facility base for fundamental scientific research.

The Scientific Council concurs with the PAC that an essential step towards increasing international interest and visibility of the Nuclotron-M/NICA/MPD development will be a

well-written white paper and conceptual design report which documents, with physics simulations, what compelling scientific questions will be answered by the proposed programme, and what machine parameters are critical to achieve scientific success. In order to attract the international interest and investment it will be crucial for the Nuclotron-M advance to bring the performance of the accelerator as close as possible to the present state of the art in relation to comparable accelerator facilities at other international centres.

The Scientific Council highly respects the pool of expertise constituted by the Machine Advisory Committee (MAC) for the Nuclotron-M/NICA accelerator complex, chaired by Professor B. Sharkov (ITEP, Moscow), and the work it is carrying out. The Scientific Council supports the recommendation of the PAC calling for a face-to-face review of the proposed plan and design for Nuclotron-M/NICA at the earliest appropriate time and looks forward to a report from the Chairperson of the MAC on the results of this review at its next meeting. A full review of the proposed design by the MAC is essential before publication of the NICA technical design report.

The Scientific Council concurs with the PAC that the JINR teams participating in the ALICE, ATLAS, and CMS experiments should strongly focus on the involvement of students and upon their efforts on the detailed preparation for analysis of data. It is time for the JINR scientists to position themselves to play a leading role in the production of scientific results. The future activities should include plans for upgrades of the LHC detectors.

The Scientific Council supports the recommendations of the PAC on the continuation of the current activities, as outlined in the PAC report.

#### Nuclear Physics Issues

The Scientific Council highly appreciates the start-up of the IREN facility and congratulates the teams from FLNP, VBLHEP, and the Budker Institute of Nuclear Physics (Novosibirsk) for this remarkable achievement. The Scientific Council looks forward to the completion at the earliest possible time of the precommissioning operations at IREN in order to start the first experiments in the second half of this year.

The Scientific Council highly appreciates the scientific results in non-accelerator physics produced by DLNP scientists and recognizes the leading role of this laboratory in the neutrino physics research at JINR. The Scientific Council looks forward to a presentation at its next meeting of the leadership role the JINR scientists are playing in various neutrino experiments and about potential streamlining of the programme in the event of constrained resources.

The Scientific Council also notes the significant contribution of DLNP physicists to nuclear and particle physics studies at accelerators in the field of intermediate energies.

#### Condensed Matter Physics Issues

The Scientific Council is very pleased to note that the work on modernization of the IBR reactor is progressing well and according to schedule, despite the delay in the delivery of the new reactor vessel.

The Scientific Council, in full coherence with the PAC recommendation, emphasizes that timely and full-scale financing of the work according to the schedule is of crucial importance for the successful completion of the reactor modernization and expects that this comprehensive support of the modernization programme will be secured.

The Scientific Council takes note on the progress in the upgrade of spectrometers to be used at the modernized IBR-2M reactor and recommends focusing efforts on the start-up of the complex of cryogenic moderators, on the development of modern spectrometers on their basis, and on the identification of new research areas compatible with new IBR-2M facilities.

The Scientific Council appreciates the high level of activities in condensed matter science pursued by the research groups at FLNP, BLTP, FLNR, and LRB.

#### Common Issues

The Scientific Council urges the PAC to concentrate their efforts on further detailed evaluation of the seven-year plan which should be recommended for the final approval by the Committee of Plenipotentiaries in November 2009.

### **V. Scientific report**

The Scientific Council notes with interest the scientific report “Broken Symmetries in Quantum Physics”, presented by Professor D. Shirkov, and thanks the speaker for his outstanding presentation.

### **VI. JINR prizes**

The Scientific Council approves the Jury’s recommendations on the JINR prizes for 2008 (Appendix).

The Scientific Council congratulates Professor V. Rubakov (INR, Moscow) on being awarded the 2008 B. Pontecorvo Prize for his essential contributions to the study of close interrelation between particle physics, astrophysics and cosmology and to the elaboration of a fundamentally new theory of physical space. The Scientific Council thanks Professor V. Rubakov for his informative presentation on this topic.

## **VII. Elections**

The Scientific Council re-elected by ballot Professor I. Wilhelm as executive co-chairman of the Scientific Council for a term of three years.

The Scientific Council elected by ballot Professors V. Bednyakov, A. Kovalík, and G. Shelkov as Deputy Directors of the Dzhelepov Laboratory of Nuclear Problems, Professors S.-A. Adam and P. Zrelov as Deputy Directors of the Laboratory of Information Technologies, and Professor D. Sangaa as Deputy Director of the Frank Laboratory of Neutron Physics, until the completion of the terms of office of the directors of the corresponding laboratories.

## **VIII. Next session of the Scientific Council**

The 106th session of the Scientific Council will be held on 24–25 September 2009.

A. Sissakian

Chairman of the Scientific Council

G. Zinovjev

Co-chairman of the Scientific Council session

N. Russakovich

Secretary of the Scientific Council