

**I. General considerations**

The Scientific Council appreciates the progress in implementing the recommendations of its 113th session and the decisions of the session of the Committee of Plenipotentiaries of the Governments of the JINR Member States (March 2013) as presented in the report by JINR Director V. Matveev.

Among others, the Scientific Council recognizes the following recent achievements:

– the significant progress in the development of major home facilities: Nuclotron-NICA, DRIBs-III as well as the cryogenic moderators and the spectrometers at the IBR-2 reactor;

– the new impressive results produced in the field of rare decays and neutrino oscillations;

– the important role of JINR's groups in the upgrade of the LHC detectors as well as the consolidation effort at the LHC itself; at the same time, the new results from recent LHC runs.

The Scientific Council is pleased to note the active work being done by the JINR Directorate to intensify cooperative contacts with other physics laboratories and international bodies such as CERN aimed at stronger integration of JINR's projects and facilities into European and worldwide research infrastructures.

**II. Recommendations on reported activities**

The Scientific Council appreciates the progress in implementing the Seven-Year Plan for the Development of JINR (2010–2016), presented by Vice-Director R. Lednický in the fields of particle physics and high-energy heavy-ion physics, and by Vice-Director M. Itkis in the fields of low- and intermediate-energy nuclear physics, nuclear physics with neutrons, and condensed matter physics.

In accordance with the recommendations of the Scientific Council, the JINR Directorate has carefully reviewed the situation with the implementation of the major projects, including the NICA facility, the construction of a Factory of Superheavy Elements, the research programme in the field of neutrino physics, and the further development of the spectrometer complex at the IBR-2 reactor. On the whole, the Scientific Council endorses the conclusions presented in the reports on the need to implement the major projects of the Seven-Year Plan in full.

The Scientific Council takes note of the report “Reactor neutrino experiments: status and prospects” presented by DLNP Director A. Olshevskiy. It underlines the scientific importance of neutrino physics experiments and the significant role of JINR played in them.

The Scientific Council notes with interest the report “The importance of physics to the economies of Europe” presented by L. Cifarelli, Vice President of the European Physical Society (EPS) and a member of the JINR Scientific Council. In 2012, the EPS commissioned the Centre for Economics and Business Research (Cebr) to conduct an independent economic analysis based on statistics in the public domain through Eurostat and covering 29 European countries. The detailed analysis, performed by Cebr over the period 2007–2010, makes possible the contribution that physics makes to the European economy to be meaningfully compared to other sectors such as manufacturing, construction and retail. It is clear that businesses in physics-based sectors contribute very significantly to employment, innovation and growth in Europe. The EPS report clearly demonstrates the importance of physics to European economies and highlights the need to support physics at all levels: in education, research, business and industry. The Scientific Council appreciates the conclusions presented in this report and thanks Professor L. Cifarelli for it.

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

The Scientific Council concurs with the recommendations made by the PACs at their June 2013 meetings as reported at this session by Professor I. Tserruya, W. Greiner, and V. Kantser.

#### Particle Physics Issues

The Scientific Council appreciates the good progress towards the realization of the Nuclotron-NICA project and congratulates VBLHEP for the stable operation of the Nuclotron as demonstrated in the successful accomplishment of Run 47 and for the realization of stochastic cooling for the first time at this facility and in Russia at large. It also supports the strategy of the Laboratory management for further improvements of the physics research programme and the active collaboration with the Nuclotron beam users.

The Scientific Council reaffirms its strong support to the fixed target programme using Nuclotron beams and the BM@N experiment and views it as an essential and integral element of the NICA project. It welcomes the PAC’s recommendations on the formation of a BM@N Detector Advisory Committee similar to the very successful one established for MPD.

The Scientific Council encourages the interaction between theorists and experimentalists in the process of the prioritization of the NICA White Paper contributions with the goal to develop a Physics Performance Report of BM@N and MPD.

The Scientific Council appreciates the significant progress made in prototyping detector elements for the MPD and takes note of the critical issues related to the MPD magnet manufacturing and to the NICA hall civil engineering. It also appreciates the important role of the Detector Advisory Committee (DAC), thanks the members of the MPD DAC for the MPD project evaluation and recommends continuation of regular reviews.

The Scientific Council supports the PAC's recommendations on the continuation of the current projects and activities in particle physics within the suggested time scales and the priorities, as outlined in the PAC report.

#### Nuclear Physics Issues

The Scientific Council supports the recommendation made by the PAC to strongly encourage the JINR Directorate for securing not only the financial issues but also human resources needed for a successful achievement of the ambitious DRIBs-III project. It also concurs with the following first-priority tasks to be implemented in full under the JINR Seven-Year Plan: construction at JINR of the world's first Factory of Superheavy Elements (SHE), including construction and commissioning of a new accelerator, DC-280, and the construction of a new building with experimental set-ups; implementation of the research programme on SHE synthesis using the U400 cyclotron; completion of the upgrade of the U400M cyclotron; preparatory and design work for the modernization of the experimental hall of the U400 cyclotron and for the upgrade of this facility.

The Scientific Council supports further extension of the DRIBs-III project which includes the upgrade of the U400 accelerator and the modernization of its experimental hall and physics instruments.

The Scientific Council appreciates the high quality of the research underway and the important results produced at JINR in the field of neutrino physics. JINR is making substantial contributions to the future neutrino experiments which should be granted high-priority status. The Scientific Council welcomes the idea of constructing a new laboratory at the Kalinin Nuclear Power Plant to become a unique experimental infrastructure for neutrino research for JINR and its Member States.

The Scientific Council realizes the need for continued support for priority areas of research, namely the synthesis and study of superheavy elements and the neutrino programme and, therefore, recommends that the Directorate take appropriate measures to maintain the world-leading role of JINR.

The Scientific Council recommends continuing scientific activities in nuclear theory as well as in nuclear physics and in nuclear physics with neutrons by BLTP and by FLNP, respectively, in 2014–2016 with first priority, within the themes reviewed by the PAC. The FLNP Directorate should accelerate the construction of the necessary beam infrastructure for the IREN facility.

The Scientific Council notes with interest and fully supports the proposal made by JINR Director V. Matveev to organize a workshop of competent specialists from Russia and elsewhere on nuclear transmutation in view of the preliminary results of JINR research of accelerator-driven systems.

#### Condensed Matter Physics Issues

The Scientific Council highly appreciates the smooth operation of the IBR-2 reactor after completion of its modernization as well as the first scientific results obtained with extracted neutron beams. The construction and development of the complex of cryogenic moderators at the reactor is also very important. Noting the achieved progress, the Scientific Council supports the PAC's recommendations on the extension of the concluding theme "Development of the IBR-2 Reactor with a Complex of Cryogenic Neutron Moderators" for the period 2014–2016 and on the opening of the new project "Construction of a complex of cryogenic moderators at the IBR-2 reactor" within this theme.

The Scientific Council notes the efforts being taken to upgrade FLNP instruments. In particular, it appreciates the start of experimental work at the DN-6 diffractometer and the new multifunctional reflectometer GRAINS as well as efforts towards the development of the NERA-PR spectrometer.

The Scientific Council supports the continuation of theory activities in the field of condensed matter physics in 2014–2018 at BLTP under a new theme "Theory of Condensed Matter". It also welcomes the opening of the new theme "Methods, Algorithms, and Software for Modeling Physical Systems, Mathematical Processing and Analysis of Experimental Data" at LIT for the period 2014–2016. Taking into account the progress in JINR educational activity, the Scientific Council appreciates the opening of the University Centre's new project "Development of modern education programmes" for 2014–2016.

#### Reports by young scientists

The Scientific Council notes with interest the following reports by young scientists, which were selected by the PACs for presentation at this session: "Small-angle scattering from multi-phase systems: investigation of the crossover between Porod and fractal regimes", "Measurements of muon forward-backward asymmetry in Drell-Yan processes

with the CMS experiment”, and “Bivalve mussels in biomonitoring of the South Africa Atlantic coastal waters”. The Scientific Council thanks the speakers: E. Anitas, I. Gorbunov, and Z. Goryainova, respectively, for their excellent presentations. The Scientific Council welcomes similar reports in the future.

#### **IV. Memberships of the PACs**

The Scientific Council thanks the outgoing members: Professors L. Riccati (INFN, Turin, Italy) and Yifang Wang (IHEP, Beijing, China) for their successful work as members of the PAC for Particle Physics.

#### **V. Prizes**

The Scientific Council congratulates the laureates of the JINR prizes for 2012 — winners of the annual scientific research competition in the fields of theoretical physics, experimental physics, physics instruments and methods, and applied physics.

#### **VI. Election of the Co-chairman of the Scientific Council**

The Scientific Council elected Professor M. Waligórski as Co-chairman of the Scientific Council for a term of three years.

#### **VII. Elections and announcement of vacancies in the directorates of JINR laboratories**

The Scientific Council elected V. Bednyakov as Director of the Dzhelepov Laboratory of Nuclear Problems for a term of five years. The Scientific Council thanks A. Olshevskiy for his successful tenure as Director of this Laboratory.

The Scientific Council endorsed the appointment of O. Culicov and E. Lychagin as Deputy Directors of the Frank Laboratory of Neutron Physics, Gh. Adam and T. Strizh as Deputy Directors of the Laboratory of Information Technologies, and A. Sorin as Deputy Director of the Veksler and Baldin Laboratory of High Energy Physics, until the completion of the terms of office of the directors of their respective laboratories.

The Scientific Council announces the vacancies of the positions of Deputy Directors of the Dzhelepov Laboratory of Nuclear Problems. The endorsement of the appointment for these positions will take place at the 115th session of the Scientific Council.

The Scientific Council endorses the proposal by the Director of the Frank Laboratory of Neutron Physics, V. Shvetsov, to announce the vacancy of a third Deputy Director position at this laboratory. The endorsement of the appointment for this position will take place at the 115th session of the Scientific Council.

The Scientific Council announces the vacancies of the positions of Directors of the Veksler and Baldin Laboratory of High Energy Physics and of the Laboratory of Radiation Biology. The election for these positions will take place at the 116th session of the Scientific Council.

### **VIII. In memory of Štefan Šáro**

The Scientific Council deeply regrets the sad loss of Professor Š. Šáro (Comenius University, Bratislava, Slovakia), a member of the JINR Scientific Council during 1993–2013, who made outstanding contributions to the development of JINR and its international cooperation.

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

The 115th session of the Scientific Council will be held on 20–21 February 2014.

V. Matveev

Chairman of the Scientific Council

M. Waligórski

Co-chairman of the Scientific Council

N. Russakovich

Secretary of the Scientific Council