

I. General considerations

The Scientific Council appreciates the progress in implementing the recommendations of the 111th session of the Scientific Council and the decisions of the session of the Committee of Plenipotentiaries of the Governments of the JINR Member States (March 2011) as presented in the report by JINR Director V. Matveev.

The Scientific Council notes the diversity and richness of the Institute's activities and wishes to commend the Laboratory directors and their staff for producing many important, world-class achievements. As examples of successful activities of JINR, the Scientific Council wishes to note:

- the significant progress achieved towards construction of the NICA facility, now entering the phase of valuable capital investments,
- the start-up of the world first pelletized cold moderator at the IBR-2 reactor,
- the discovery, with important contributions by JINR groups, of the new Higgs-like boson at the LHC,
- the involvement of JINR in the measurement of the neutrino mixing angle θ_{13} ,
- the new confirmation of the discovery of the superheavy element 117,
- the progress in construction of the new experimental hall of the Flerov Laboratory of Nuclear Reactions,
- the essential contribution by JINR to construction of the Russia-based LHC Tier-1 centre,
- the promising steps to closer cooperation between JINR and GSI/FAIR,
- the progress towards integration of JINR basic facilities in the European Research Infrastructure, based on recent negotiations with the EU Commission and ESFRI management.

The Scientific Council notes that a good balance between well-focused internal and external activities of the Institute is being achieved, and encourages the JINR Directorate to reach a good balance between hardware construction and analysis leading to physics publications.

II. Recommendations on reported activities

The Scientific Council takes note of the report "Activities in the field of condensed matter physics at the IBR-2 reactor" presented by FLNP Department Head D. Kozlenko. The Scientific Council welcomes the beginning of the regular operation of the modernized

IBR-2 reactor for scientific experiments. A very important result is the resumption of the user programme based on the IBR-2 spectrometer complex, which provides ample opportunities for researchers from the Member States and other countries to conduct scientific experiments using neutron scattering methods. The Scientific Council notes the high quality of scientific research conducted by JINR in the field of condensed matter physics. An important task is the further development of the spectrometer complex aimed at expanding the range of the scientific problems to be addressed and of the experimental possibilities.

The Scientific Council takes note of the report “Prospects for spin physics research at Nuclotron-NICA” presented by VBLHEP Director V. Kekelidze. The Scientific Council recognizes the opportunities of the Nuclotron-NICA accelerator complex for competitive research with polarized beams. It encourages further work on the scientific programme for the NICA collider, including experiments on spin physics with beams extracted from the Nuclotron, and the organization of dedicated workshops under the auspices of the international spin physics community. The Scientific Council congratulates JINR for the success of the 20th International Symposium on Spin Physics (Dubna, 17–22 September 2012). The Scientific Council highly appreciates joining efforts in the construction of both NICA and FAIR as unique and complementary facilities.

The Scientific Council takes note of the report “Progress of activities for the IREN project” presented by FLNP Deputy Director V. Shvetsov, and appreciates the successful start of the IREN experimental programme with extracted beams and target. It recommends focusing of efforts on the development of the accelerator and nonmultiplying neutron production target with a view to bringing the IREN facility to the world-class level within the shortest possible time.

The Scientific Council takes note of the reports “JINR plans for participation in the upgrades of the LHC and detectors” presented by the leaders of these activities in JINR groups of the ALICE, ATLAS and CMS experiments: A. Vodopyanov (in written form), A. Cheplakov, and A. Zarubin. The Scientific Council congratulates the participants of the ATLAS and CMS experiments for the discovery of a new, Higgs boson-like particle. This result opens a new chapter in the history of particle physics and shapes the physics agenda for the foreseeable future. A fruitful participation of JINR scientists in the upgrade programmes for the collider and the LHC experiments is very important for the progress of the Institute. The Scientific Council welcomes these intentions and their implementation within the “Seven-Year Plan for the Development of JINR (2010–2016)” and beyond.

The Scientific Council notes with particular interest the report “Joint educational

projects with BNL and CERN for school students and teachers of physics” presented by VBLHEP Department Head Yu. Panebrattsev, and appreciates the work accomplished, given the utmost importance of developing young people’s interest in science and technology and of attracting talented young scientists from the Member States to join JINR research and innovation projects. The Scientific Council considers the establishment, jointly with the University “Dubna”, of the Academician Alexey Sissakian Education Centre to be an important step in sharing the achievements of modern science and technology and for improving the quality of education for a new generation of young scientists, and recommends that the JINR Directorate support the effort to further develop this Centre. The Scientific Council thanks the Rector of the University “Dubna”, D. Fursaev, for the explanations given during the visit to the Centre.

III. Recommendations in connection with the PACs

The Scientific Council concurs with the recommendations made by the PACs at their June 2012 meetings as reported at this session by Professors E. Tomasi-Gustafsson, W. Greiner, and V. Kantser.

Particle Physics Issues

The Scientific Council appreciates the significant progress in upgrading the VBLHEP accelerator complex, and congratulates the Laboratory staff on the successful Run 45 (February-March 2012) of the Nuclotron when the deuteron beam energy was increased to 4.5 GeV/u for the first time. It also appreciates the proposed strategy for the review and the construction of the NICA complex with full involvement of the JINR Member States, and recommends that the VBLHEP Directorate concentrate maximum resources on this flagship project.

The Scientific Council is pleased to note the new contributions to the White Paper for the research programme of the NICA project, the holding of the dedicated NICA–FAIR Bilateral Workshop “Matter at Highest Baryon Densities in the Laboratory and in Space” (Frankfurt Institute for Advanced Studies, 2–4 April 2012), and looks forward to the continuation of the important common work for both accelerator and detector developments.

The Scientific Council also notes the fruitful dialog between the MPD team and Detector Advisory Committee (MPD DAC). Important modifications for the solenoid design and the MPD end-cap have been adopted. The Scientific Council thanks the members of the MPD DAC for the detailed evaluation of the project.

The Scientific Council supports the PAC’s recommendations on the approval of

JINR's participation in the new project NA61/SHINE and on the continuation of the current first-priority projects and activities in particle physics within the suggested time scales, as outlined in the PAC report. It highly appreciates the substantial hardware contributions of JINR groups in external experiments and encourages them to focus their efforts on physics analysis that would result in higher visibility and recognition of the JINR participation in these experiments.

The Scientific Council recognizes the importance of the results obtained with the active participation of JINR physicists in the ATLAS, ALICE, and CMS experiments. It asks the PAC to consider the final proposals for the participation of the JINR groups in the upgrades of the detectors and to inform the Scientific Council about this work at its next session.

Nuclear Physics Issues

The Scientific Council notes with satisfaction the approval by the International Union of Pure and Applied Chemistry of the names Flerovium and Livermorium for elements 114 and 116 in honour of the Flerov Laboratory of Nuclear Reactions and the Lawrence Livermore National Laboratory (USA).

The Scientific Council supports continuation of the research programme within the theme "Improvement of the JINR Phasotron and Development of Cyclotrons for Fundamental and Applied Research", focused on the design and improvement of accelerators for hadron therapy applications.

The Scientific Council also supports continuation of the programme to study the production, decay and interaction of light mesons aimed at determining the symmetries and the interaction dynamics, which is carried out via the theme "Physics of Light Mesons" at the intermediate energy accelerators in Jülich, Mainz, Villigen, Gatchina, and Dubna. The Scientific Council particularly notes the interesting programme of the MEG-PEN project devoted to the study of the rare and forbidden decays $\pi^+ \rightarrow e^+ \nu$ and $\mu^+ \rightarrow e^+ \gamma$ at PSI and of the SPRING project concerned with polarization phenomena in hadron interactions, which were recommended for extension by the PAC.

The Scientific Council strongly supports the efforts of the FLNR Directorate towards the development of ECR ion sources. This effort is an important part of the scientific programme allowing the Laboratory to reach a considerable increase of beam intensity needed for further studies.

Condensed Matter Physics Issues

The Scientific Council appreciates highly the first stage of operation of the modernized IBR-2 reactor and supports the implementation of the programme of regular

physics experiments. It also welcomes the FLNP programme of applied research, which is conducted in close collaboration with Member States.

The Scientific Council appreciates the continuation of work for the timely commissioning of the upgraded instruments at neutron beams extracted from the reactor and notes the efforts being taken for the construction of the DN-6 diffractometer and the upgrade of the Fourier stress diffractometer FSD.

The Scientific Council recognizes the results achieved in proton radiotherapy within the theme “Medical and Biological Research with JINR Hadron Beams” and supports the PAC recommendations for its extension for a new three-year term. Regarding CARS microscopy and microspectroscopy as complementary to existing methods at JINR, the Scientific Council also supports the recommendation for the opening of the new theme “A Multimodal Platform for Raman and Nonlinear Optical Microscopy and Microspectroscopy for Condensed Matter Studies”. Noting the discussions concerning the new theme entitled “Biogeochemical Study of Cosmic Matter on Earth and in Nearby Space. Research on the Biological and Geochemical Features of the Early Earth”, the Scientific Council concurs with the PAC that a detailed scientific proposal, the financial plan for its realization, and suggestions for the involvement of JINR Member States in this activity are needed for its approval.

The Scientific Council notes the progress in realization of the MUON project and shares the PAC’s opinion about its continuation by expanding activity at JINR facilities.

Common Issues

The Scientific Council would like to point out that major physics themes and projects (like hadronic physics and cancer therapy with accelerators) are developed in different laboratories and are monitored by different PACs. The Scientific Council suggests that the JINR Directorate coordinate these efforts towards an efficient and coherent conduct of these research themes.

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: “Influence of accelerated ^{18}O ions on the growth of HPRT-mutant subclones of Chinese hamster cells”, “The ^{10}He resonant states observed in correlation measurements of the $^8\text{He}(^3\text{H},p)^{10}\text{He}$ reaction”, and “The BES-III experiment”. The Scientific Council thanks the speakers: P. Bláha, S. Krupko, and I. Denysenko, respectively, for their excellent presentations and wishes to receive such presentations also in the future.

IV. Memberships of the PACs

As proposed by the JINR Directorate, the Scientific Council appoints Professor I. Tserruya (WIS, Rehovot, Israel) as Chairperson of the PAC for Particle Physics for a term of three years. The Scientific Council thanks Professor E. Tomasi-Gustafsson for her very successful work as Chairperson of this PAC and extends her membership in this PAC for one year.

The Scientific Council re-appoints Professor W. Greiner as Chairperson of the PAC for Nuclear Physics for a term of three years.

The Scientific Council re-appoints Professor V. Kantser as Chairperson of the PAC for Condensed Matter Physics for a term of three years. It also appoints Professors V. Lisý (Technical University, Košice, Slovakia) and D. Nagy (IPNP, Budapest, Hungary) as new members of this PAC for a term of three years. The Scientific Council thanks the outgoing members: Professors P. Balgavý, L. Bottyán and G. Eckold for their very successful work as members of this Committee.

V. Awards and prizes

The Scientific Council endorses the proposal of the JINR Directorate to award the title “Honorary Doctor of JINR” to Professors A. Sigov (MIREA, Moscow, Russia) and T. Zhanlav (NUM, Ulaanbaatar, Mongolia), in recognition of their outstanding contributions to the advancement of science and the education of young scientists.

The Scientific Council congratulates Professor A. Săndulescu, Vice-Director of JINR during 1983–1986, on being awarded the Commemorative Honorary Medal of JINR, in recognition of his many contributions to the development of JINR and its cooperation with Romanian research centres.

The Scientific Council congratulates Professor L. Ponomarev (Kurchatov Institute, Moscow, Russia) on being awarded the V. Dzhelepov Prize for his outstanding achievements in the field of experimental and theoretical research aimed at addressing applied problems with the use of nuclear physics methods, and thanks him for his informative presentation on this topic.

The Scientific Council congratulates the laureates of the JINR prizes for 2011 — winners of the annual scientific research competition in the fields of theoretical physics, experimental physics, physics instruments and methods, and applied physics.

VI. Elections and announcement of vacancies in the directorates of JINR laboratories

The Scientific Council appointed by ballot A. Arbuzov, M. Hnatič, and A. Isaev as Deputy Directors of the Bogoliubov Laboratory of Theoretical Physics, and A. Popeko and V. Zagrebaev as Deputy Directors of the Flerov Laboratory of Nuclear Reactions (FLNR), until the completion of the terms of office of the directors of their respective laboratories.

The Scientific Council agrees with the proposal by the FLNR Directorate to postpone the election for the third Deputy Director position in this laboratory until the 113rd session of the Scientific Council.

The Scientific Council announces the vacancy of the position of the Director of the Dzhelapov Laboratory of Nuclear Problems. The election for this position will take place at the 114th session of the Scientific Council.

VII. Election of the new membership of the Scientific Council

The Scientific Council notes the information presented by the Secretary of the JINR Scientific Council, N. Russakovich, about the forthcoming election of the membership of the Scientific Council for a new five-year term, which will take place at the session of the JINR Committee of Plenipotentiaries in March 2013.

VIII. General discussion

The Scientific Council notes with satisfaction the remarkable progress in many key activities of JINR, and congratulates the Laboratory for these achievements. In spite of the present excellent achievements in a very broad variety of activities the Scientific Council cautions the Directorate that remaining competitive also in the future may well require careful planning for focusing resources on key projects.

It is certainly crucial for attracting young talents from all Members States and beyond that JINR should strengthen its projects that are most visible internationally. The Scientific Council encourages the Directorate to continue efforts in such strategic planning with a strong view to the long term future of JINR.

The Scientific Council particularly encourages the nomination of younger candidates and of female candidates for future appointments in the directorates of JINR laboratories.

IX. In memory of Čestmír Šimáně

The Scientific Council deeply regrets the sad loss of Professor Č. Šimáně, Vice-Director of JINR during 1973–1977 and member of the JINR Scientific Council during

1956–1989, who made outstanding contributions to the development of JINR and its international cooperation, especially with Czech and Slovak research centres.

X. Next session of the Scientific Council

The 113th session of the Scientific Council will be held on 21–22 February 2013.

V. Matveev
Chairman of the Scientific Council

Gh. Stratan
Co-chairman of the session

N. Russakovich
Secretary of the Scientific Council