

I. Preamble

1. The Programme Advisory Committee for Particle Physics takes note of the information presented by JINR Vice-Director R. Lednický on the Resolution of the 103rd session of the JINR Scientific Council (February 2008) and on the decisions of the JINR Committee of Plenipotentiaries (March 2008).

The PAC is pleased to learn about the decision of the Committee of Plenipotentiaries 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 world scientific community (e.g., Nuclotron-M and NICA/MPD, DRIBs-III, and a complex of state-of-the-art neutron spectrometers for the modernized reactor IBR-2M).

Once the scientific justification and technical feasibility of the NICA/MPD programme have been firmly established, the PAC recommends that the JINR Directorate present the case for the NICA/MPD programme to the relevant international advisory bodies such as ECFA or NuPECC in order to gain international credibility, and to explore the possibility of integrating this project in the international accelerator development programme.

The PAC highly appreciates the important emphasis expressed by the Scientific Council that, as part of the effort to optimize the staffing of JINR, the JINR Directorate should take deliberate actions to attract and retain the best young scientists from the Member States of the Institute. This is essential to secure the future of JINR.

The PAC notes the opening in the JINR University Centre of a new JINR-based chair of the Moscow Institute of Physics and Technology “Fundamental and Applied Issues of the Physics of the Microworld”, and in the University “Dubna” — of a new JINR chair “Nanotechnology and New Materials”.

2. The PAC is especially pleased to learn about the visit to JINR, on 18 April 2008, of the new President of the Russian Federation, D. Medvedev. Together with leaders of government agencies and regions of the host country, the President was presented with information on the research work of the Flerov Laboratory of Nuclear Reactions and with other areas of the Institute’s activity, and visited an exhibition of innovation projects of JINR and other high-technology organizations of Dubna.

This visit took place on the occasion of the meeting, held in Dubna, of the State Council of the Russian Federation, which was chaired by President D. Medvedev, and was

dedicated to the “Development of the National Innovation System in the Russian Federation”.

The PAC notes with satisfaction that President D. Medvedev highly appreciated the results of JINR’s basic research and underlined the role of science in the innovation process, that he supported the proposals of the JINR Directorate for the establishment in Dubna of an International Science and Innovation Centre for Nanotechnology and of a Centre for Radiation Medicine with JINR’s participation, and that he expressed his positive attitude to the plans for the increase of the JINR budget in 2011–2015.

3. The PAC congratulates A. Sissakian on being elected a full member of the Russian Academy of Sciences and a member of the Academy Presidium, and wishes him much success in his scientific activity and in his work as Director of the Joint Institute for Nuclear Research.

II. Recommendation concerning the information about VBLHEP

The PAC takes note of the information about the structure of the new JINR laboratory, Veksler and Baldin Laboratory of High Energy Physics, and about its near-term scientific programme, as presented by VBLHEP Acting Director V. Kekelidze.

III. Recommendation on the progress of the Nuclotron-M/NICA projects

The PAC takes note of the report on progress towards realization of the Nuclotron-M/NICA projects. The PAC was very impressed from the report by G. Trubnikov concerning the new intensity and approach in the activity resulting in significant progress towards upgrading the Nuclotron–M machine, a project which is proceeding according to plan.

IV. Recommendation concerning information from the Nuclotron-M/NICA Machine Advisory Committee

The PAC takes note of the very positive report from the Machine Advisory Committee for the Nuclotron-M/NICA accelerator complex.

The PAC recommends that the MAC should meet at JINR at the end of 2008 to make an in-depth critical review of the NICA draft technical design report before its publication.

V. Recommendation on the further development of the Nuclotron-M/NICA scientific programme

The PAC notes with interest the proposed scientific programme of the Nuclotron-M/NICA projects and endorses the main scientific directions of this theme. The scientific observables for the mixed phase and potential future spin physics programmes need to be sharpened by detailed simulations to document the requirements for the success of this scientific research in a forthcoming white paper on this topic. The PAC notes that the NICA/MPD programme will be an important means to attract and retain young scientists and engineers to JINR.

VI. Recommendation for activities at JINR related to the ILC

The PAC notes with interest the report presented by JINR Chief Engineer G. Shirkov on the progress for ongoing developments at JINR related to the ILC, in particular on the recent visit of the ILC GDE where information concerning possible siting of the ILC in the Moscow Region was actively discussed.

The PAC notes that to build credibility as a potential host laboratory for the ILC adequate resources from the JINR Directorate will be necessary to allow technical developments and contributions at the international level to the ILC development. The PAC would like to be informed regularly about the progress of these activities.

VII. Recommendation concerning reports on readiness of the JINR teams working on the LHC experiments to produce first scientific results

The PAC takes note of the information that the JINR groups taking part in the ALICE, ATLAS, and CMS experiments are ready to obtain first physics results at the time of LHC start-up. The PAC recommends that these teams continue their active participation in these experiments and looks forward to a report on the first experience with detector performance and LHC data analysis at JINR at its next meeting.

VIII. Recommendations on the current status of the JINR Central Information and Computing Complex and its user service

The PAC takes note of the report presented by LIT Director V. Ivanov on the current status of the JINR Central Information and Computing Complex (CICC). The PAC is pleased to note the successful achievement of the CICC performance, earlier planned for the end of 2008. It also appreciates the ongoing work at LIT towards a significant increase of the mass data storage capability of the CICC in order to bring it to the capacity required

by experiments. The PAC welcomes the holding of workshops and seminars for users on the basis of the Grid Lab.

IX. Recommendation on information provided by representatives of the JINR CICC user community about their experience with using JINR's computing infrastructure

The PAC takes note of the information, presented by V. Bednyakov on behalf of the CICC user community, concerning their experience with using JINR's computing infrastructure. Although a large amount of work is being done on the improvement of the CICC performance, concern was expressed regarding a misbalance in favour of future activities (e.g., the LHC experiments) compared to support for ongoing experiments. The PAC notes that the feedback from the users is very essential for the development of the JINR computing and network infrastructure. The PAC recommends that the LIT Directorate have regular meetings with the CICC users and the leaders of JINR's ongoing and future projects where the strategy for the further upgrade of the CICC and the allocation of existing manpower and resources can be discussed.

X. Recommendation for a new project

The PAC has considered the proposal of a new project, "JINR's participation in the Daya Bay neutrino experiment", and recommends its approval for execution until the end of 2011. The PAC wishes to emphasize the importance of the participation in this promising experiment and the positive impact that it will have on further development of the scientific relations between China and JINR.

XI. Recommendations on the activities previously approved for completion in 2008 and proposed for continuation

1. The PAC takes note of the report on the theme "Particles and fields". The PAC appreciates the results obtained in the main research directions: the Standard Model of fundamental interactions, hadron structure and the QCD vacuum, heavy-flavor physics, properties of dense and hot hadronic matter. The PAC is pleased to note the significant role of the theme in the theoretical support of experiments at the LHC and in the preparation of the scientific programme of the NICA/MPD project.

The PAC recommends closing this theme and approval for opening a new theme "Theory of elementary particles" for execution until the end of 2013.

2. The PAC takes note of the report on the theme "Modern mathematical physics". The PAC appreciates the high theoretical level of the results related to the development of

methods of mathematical physics and their application to the fundamental problems of theoretical physics.

The PAC recommends closing this theme and approval for opening a new theme “Modern mathematical physics: gravity, supersymmetry, integrability” for execution until the end of 2013.

3. The PAC takes note of the report on JINR’s participation in the COMPASS experiment and appreciates the high scientific significance of the results obtained in this experiment with the important contribution by JINR physicists. The PAC encourages the Dubna team to finalize and publish results on lambda polarization and the Primakoff Effect in which it has played a leading role. The PAC recommends continuation of this activity until the end of 2010.

4. The PAC takes note of the report on JINR’s participation in the CDF project. The PAC highly appreciates the important physics results obtained by the collaboration, and notes the active participation of the Dubna group in this activity.

The PAC reiterates the importance of involving students and young scientists in this research. The PAC recommends continuation of JINR’s participation in this project until the end of 2011.

5. The PAC takes note of the report on JINR’s participation in the D0 project. The PAC considers the discovery of the cascade baryon Ξ_b by the D0 collaboration to be an important achievement with a key contribution of the Dubna group.

The PAC reiterates the importance of involving students and young scientists in this research. The PAC recommends continuation of JINR’s participation in this project until the end of 2011.

6. The PAC takes note of the report on the BECQUEREL project. The PAC highly appreciates the importance of this active collaboration which has strong participation from the Member States and which has produced 5 advanced degrees for young scientists from 2005–2008. The PAC supports continuation of this activity with first priority from 2009–2011. However, the PAC is also concerned about the slow pace of scientific progress resulting from the labour-intensive scanning technique used, and invites the project leaders to present a proposal at a future meeting including a plan for significantly improving the productivity of the programme either by significant upgrades to the existing instrumentation or evolution of the experimental technique to electronic detection techniques.

7. The PAC takes note of the report on JINR’s participation in the NA49 project. The PAC notes the relevance of the scientific programme and the importance of the

participation in this project for JINR. The PAC recommends continuation of JINR's participation in the project until the end of 2011.

Taking into account the interest of a JINR group to participate in the new project NA61, which will use the same set-up as NA49 experiment, the PAC supports participation by the JINR group in the approved proton-proton aspect of the programme. Concerning possible future heavy-ion data taking in NA61, the PAC recommends that this group prepare a corresponding proposal for presentation at a future meeting. This report should include a discussion of the relation and balance of this proposed heavy-ion activity to the participation in the ALICE heavy-ion research effort at JINR.

8. The PAC takes note of JINR's participation in the NUCLEON project and recommends continuation of the work on this programme. The PAC notes that JINR is taking part in this very important experiment despite a modest budget. As proposed by the DLNP Directorate, the PAC recommends continuation of this activity under DLNP's internal laboratory theme.

9. The PAC takes note of the written report on the theme "Physics and engineering of feedback systems in synchrotrons". The PAC acknowledges the successful completion of the high power components of the LHC damping system and notes that the JINR group is now recognized world-wide for its expertise in this field. The PAC also notes the importance of this group to JINR projects such as NICA. The PAC recommends continuation of this activity until the end of 2011.

10. The PAC takes note of the written report on the NN & GDH project and recommends continuation of this activity until the end of 2011. The PAC recognizes the fundamental importance of polarization studies of double polarized measurements at Mainz and Prague. A combined technical and theoretical participation of the JINR group in these modern experiments represents an important example of international cooperation.

11. The PAC takes note of the written report on the THERMALIZATION project and recommends continuation of this activity until the end of 2011.

XII. Scientific report

The PAC notes with interest the report "Spin physics at the NICA accelerator complex" presented by A. Nagaytsev, and thanks the speaker. The PAC recommends continuation of the effort for a detailed elaboration of the spin physics programme that will be accomplished at NICA. The NICA spin programme should be coherently assembled with the benefit of the considerable existing experimental and theoretical spin physics

expertise at JINR. The PAC looks forward to the goals of this research being documented in a forthcoming white paper on the NICA scientific programme.

XIII. Next meeting of the PAC

The next meeting of the PAC for Particle Physics will be held on 29–30 January 2009.

The following items are proposed to be included in the agenda:

- JINR's Particle Physics Programme for 2009–2011
- Consideration of new projects and themes
- Reports and recommendations on the projects to be completed in 2009
- Information from the Nuclotron-M/NICA Machine Advisory Committee
- Report on progress for ongoing developments at JINR related to the ILC
- Report on progress towards a white paper on the mixed phase and potential future spin physics programs at NICA
- First experience on the performance of the ALICE, CMS, and ATLAS detectors and presentation of preliminary data from proton running at the LHC.

J. Nassalski

Chairperson of the PAC