

I. Preamble

The Chairperson of the PAC, W. Nawrocik, welcomed the PAC members, in particular the new members P. Balgavý, L. Bottyán, V. Kantser, and A. Kuzmin, and the ex-officio members from JINR, and presented the implementation of the recommendations of the previous PAC meeting.

JINR Chief Scientific Secretary N. Russakovich informed the PAC about the Resolution of the 103rd session of the JINR Scientific Council (February 2008) and about the decisions of the Committee of Plenipotentiaries (March 2008).

II. Status of modernization of the IBR-2 reactor

The PAC was informed by A. Vinogradov about the status of the modernization of the IBR-2 reactor and is pleased to note that this work is proceeding well and according to schedule. The PAC supports the reported plan concerning the technical and financial activities for the reactor modernization, taking into account its previous recommendations on the priority work for completing the complex of cryogenic moderators.

The PAC looks forward to the continuation of the comprehensive support of the modernization programme that is being given by the FLNP and JINR directorates.

III. Recommendations on the concluding and the new themes

1. The PAC took note of the report, presented by S. Kulikov, on the theme “Development and Creation of Elements of Neutron Spectrometers for Condensed Matter Investigations” (04-4-1052-2004/2008), and the proposed programme of research for the next years. The PAC recommends extension of this theme until the end of 2011. The PAC suggests that consideration be given to improving the transport of cold neutrons from the moderator to the start of the instrument beam lines.

2. The PAC took note of the report, presented by E. Krasavin, on the theme “Radiation and Radiobiological Investigations at the JINR Basic Facilities and in the Environment” (04-9-1015-96/2008). The PAC notes the high quality of radiobiological research conducted at LRB. The PAC heard with much interest the information about the development, jointly with other JINR laboratories, of a new cancer cell control method using nanotechnology and super-high frequency penetrating electromagnetic radiation. The PAC suggests that work in this promising direction should be supported.

Another new important aspect of the LRB activity is the implementation of a unique, powerful confocal Coherent Anti-Stokes Raman Scattering microscope as a basic facility that allows achieving the front line of biological studies at the cellular level.

The PAC recommends extension of this theme until the end of 2011.

The PAC stresses the importance of the investigation of lesions in bioobjects caused by neutrons and HZE particles. The PAC suggests that studies of radiation damage in biological objects induced by high-energy neutrons be considered for inclusion in the LRB programme.

3. The PAC took note of the report, presented by A. Balagurov, on the closing theme “Neutron Investigations of the Structure and Dynamics of Condensed Matter” (04-4-1031-99/2008). The PAC appreciates the high level of research activities and important scientific results obtained in the fields of complex magnetic oxides, magnetic fluids, multilayer superconducting films, lipid multilayers as well as in applied investigations.

The PAC considered the proposal, presented by D. Kozlenko, for opening a new theme: “Investigations of Nanosystems and Novel Materials by Neutron Scattering Methods”. The PAC appreciates the extended field of experimental activity based on the combined exploitation of Russian, JINR, and internationally available neutron scattering facilities, and recommends approval of this new theme until the end of 2011.

The PAC notes the overriding importance of implementing the user programme at the spectrometer complex of the upgraded IBR-2M reactor.

4. The PAC took note of the report, presented by P. Apel, on the theme “Radiation Effects and Modification of Materials, Radioanalytical and Radioisotopic Investigations at the FLNR Accelerators” (04-5-1013-96/2008). The studies performed under this theme cover a broad range of application-oriented scientific tasks and reflect modern trends in radiation physics, materials research, radiochemistry and accelerator technology. The PAC notes the evident interest of the JINR Member States in this research programme.

The PAC recommends extension of this theme until the end of 2011.

5. The PAC took note of the report, presented by V. Priezzhev, on the closing theme “Theory of Condensed Matter” (01-3-1030-99/2008). The PAC appreciates the important results obtained within the theme, in particular in the field of complex materials and nanostructures, mathematical problems of many-particle systems, and the theory of self-organized criticality.

The PAC considered a proposal for opening a new theme: “Theory of Condensed Matter and New Materials”, and recommends its approval until the end of 2013.

6. The PAC took note of the report, presented by D. Fursaev, on the theme “Organization, Maintenance and Development of the University-Type Educational Process at JINR” (06-0-1026-98/2008). The PAC appreciates the impressive progress of the JINR Educational Programme, pursued by the University Centre (UC) during the last 10 years, in particular the increased number of students and JINR-based university departments, the successful organization of the international practice for students of JINR Member States, and the creation of educational infrastructure. The PAC recommends extension of this theme until the end of 2013. The PAC supports the proposal by the UC Director concerning the increase of the budget required to complete the creation of student laboratories and to enlarge the number of PhD students.

IV. Priorities in the development of spectrometers for the IBR-2M reactor

The PAC received a report concerning the priorities in the development of spectrometers for the IBR-2M reactor, presented by D. Kozlenko. The PAC welcomes and approves the realization of the first-priority projects: DN-6, GRAINS, SKAT/EPSILON. Moreover, the existing instrument suite should receive the funding necessary for operation. Future projects should include improvements to instruments which can contribute to the study of nanomaterials.

V. Current research in the field of radiotherapy with JINR hadron beams

The PAC was informed by G. Mitsin about the ongoing research in the field of radiotherapy with JINR hadron beams. The PAC welcomes the efforts taken by the JINR Directorate for the establishment at Dubna of a Centre for Radiation Medicine as well as the collaboration with the Belgian company IBA in the development of advanced technologies in the proton therapy field. At the same time, the PAC considers it necessary that the clinical research using the DLNP Phasotron proton beams should be continued until the Centre for Radiation Medicine has been commissioned.

VI. Scientific reports

The PAC heard with interest the scientific reports: “EXAFS-spectroscopy method in condensed matter physics: first results from the energy-dispersive EXAFS station at the RRC “Kurchatov Institute”” presented by V. Efimov, “Investigations of the structure of nanoobjects using a laser scanning confocal microscope” presented by S. Tyutyunnikov, and “Development of inelastic neutron scattering methods for research of the molecular dynamics of condensed matter” presented by I. Natkaniec.

VII. Next meeting of the PAC

The next meeting of the PAC for Condensed Matter Physics will be held on 26–27 January 2009.

Its tentative agenda will include:

- Reports and recommendations on the projects and themes to be completed in 2009
- Status of modernization of the IBR-2 reactor
- General guidelines of the FLNP instrument user policy
- Reports on modernization of FLNP instruments
- Scientific reports
- Poster session
- Visit to the Flerov Laboratory of Nuclear Reactions.

W. Nawrocik

Chairperson of the PAC