I. Preamble

The Chairperson of the PAC, V. Kantser, welcomed the PAC members, the *ex officio* members from JINR, and the new Scientific Secretary of the PAC, O. Belov, appointed by the JINR Directorate. The PAC Chairperson presented a short overview of the PAC report delivered at the session of the JINR Scientific Council (February 2009) and information about the implementation of the recommendations of the previous PAC meeting.

JINR Vice-Director M. Itkis informed the PAC about the Resolution of the 105th session of the JINR Scientific Council (February 2009), the decisions of the Committee of Plenipotentiaries (March 2009), and about the preparation of the Draft Seven-Year Plan for the Development of JINR for 2010–2016. The PAC is pleased to note that all the milestones of the JINR research in the areas of condensed matter physics have been reflected in the presented draft of the plan.

II. Recommendations on the theme to be completed in 2009 and on the proposal of a new theme

The PAC heard with much interest the report presented by G. Mitsyn about the closing theme "Further Development of Methods and Instrumentation for Radiotherapy and Associated Diagnostics with the JINR Hadron Beams" (04-2-1035-2001/2009). The PAC notes with satisfaction the significant progress during the reviewed period achieved with this research, which started as early as 1967. The most important achievement was the elaboration of the 3D conformal proton radiotherapy techniques and their realization in radiotherapy sessions at the Phasotron 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 medical and biological research using the DLNP Phasotron proton beams should be continued.

Recommendation 1. The PAC recommends completion of the theme “Further Development of Methods and Instrumentation for Radiotherapy and Associated Diagnostics with the JINR Hadron Beams” by the end of 2009.

Recommendation 2. The PAC recommends continuation of this research within the new theme "Medical and Biological Research with the JINR Hadron Beams" in 2010–2012.

III. Status of modernization of the IBR-2 reactor

The PAC was informed by A. Vinogradov about the work already accomplished and about the main goals to be achieved in 2009 on the modernization of the IBR-2 reactor, and is pleased to note that this work is proceeding in accordance with the technical and financial plans. Thus, the mounting of the IBR-2M vessel was completed; the installation of the movable reflector MR-3 at the working place will be finished soon; the installation of the executive mechanisms of the automatic safety and control system (ASCS), the assembly of ASCS cabinets and of the control panel in the main control room as well as electronic equipment in the reserve control room are being realized according to the schedule.

The PAC considers that timely and full financing of work in 2009 is very important for the successful completion of the reactor modernization and hopes that adequate support of the modernization by the FLNP and JINR directorates will be continued in order to finish in time all the tasks planned for this year.

Recommendation. The PAC recommends arranging a visit of PAC members to the IBR-2 reactor in order to familiarize them on site with the modernization work under way at FLNP.

IV. Reports on the current state of modernization of FLNP instruments and on the plan of modernization and updating of the complex of spectrometer facilities for the near three-year period and long-term seven-year period

The PAC took note of the report, presented by D. Kozlenko, on the modernization of the spectrometer complex of the IBR-2M reactor in the short-range (three years) and long-range (seven years) periods. The concentration of available resources on the first-priority instruments (DN-6, GRAINS, SKAT/EPSILON) in the short-range period is essential for their realization according to the schedule. The preparation of the spectrometer complex to the IBR-2M start-up at the end of 2010 is another important activity in the short-range period. Special attention should be paid to the work on the upgrade of the spectrometers involving the reactor zones where there will be no access after the reactor start-up. As regards science, the spectrometer complex upgrade should take into account the most important long-term research fields. In particular, it should assume long-term complementarity with the ESS project and development of synchrotron radiation techniques. Adequate funding from the JINR budget should be also received to ensure timely completion of this activity.

The PAC was informed by D. Kozlenko about the status of the DN-6 spectrometer. The PAC appreciates the progress in the realization of this first-priority task and notes that for the successful completion the funding should be provided according to the schedule.

The PAC notes the importance of modernization of the YuMO spectrometer as the most user requested instrument at IBR-2. The PAC highly appreciates the development of the SANS instrument with a new type of PSD as a detector system providing a unique dynamic range (Qmax/Qmin ratio). The PAC takes into account the high request for SANS by the scientific community and expects that the successful development in this direction will have a high impact on the development of various important fields of science — from bioscience to nanomaterials science. The PAC supports the plans of the Frank Laboratory Directorate concerning further development of FLNP instruments.

V. Perspective of development of the JINR UC in 2010–2016

The PAC was informed by S. Pakuliak about the proposals of the University Centre (UC) concerning of creation of the system of several pilot module courses in English (on nuclear physics, neutron physics, etc.), which can be offered as educational blocks to the students from the Member States.

The PAC appreciates the collaboration of the UC with the Plenipotentiaries of the Member States in the development of a special system of scholarships/grants in order to engage students from a larger number of Member States to the postgraduate studies at JINR. The PAC was informed about the progress of the UC in the completion of the creation of the students' laboratories. The PAC also supports the collaboration of the UC with the University "Dubna". The PAC was impressed by the work of the UC with secondary school pupils, in particular, by a practical course on physics in the UC.

Recommendation 1. The PAC supports the UC's efforts to establish bilateral agreements with educational bodies of the Member States in order that the UC courses and activities become formally recognized.

Recommendation 2. The PAC recommends intensification of contacts with the Plenipotentiaries in order to organize regular visits to the UC of natural science teachers and school pupils from Member States.

VI. Scientific reports

The PAC heard with interest the scientific reports on physical and biological themes: "Interfaces in amphiphilic systems" presented by M. Belushkin, "Response of mice retina to exposure of γ-irradiation, accelerated protons, and N-nitroso-N-methylurea" presented by

M. Loguinova, “Crystallographic preferred orientation and properties of quartz: a neutron diffraction study of Earth’s crust rocks” presented by R. Vasin, and “Modeling the high critical temperature superconducting phase transition in cuprates within the two-band Hubbard model” presented by Gh. Adam. The PAC notes the high level of the reports and recommends that the JINR Directorate present these materials on the web site of the Institute. The PAC looks forward to hearing new scientific reports of JINR researchers at its future meetings.

VII. Information about scientific meetings

The PAC heard with interest the information, presented by V. Krylov, about the 1st, 2nd, and 3rd International Workshops “Molecular Simulation Studies in Material and Biological Sciences” (MSSMBS: 2004, 2006, 2008) which are regularly organized at JINR. Contributions are mostly by leading molecular simulation centres of Japan and Russia including European research groups. Scientists from research laboratories and universities of Japan and Russia (Institute of Bioorganic Chemistry, Institute of Biochemical Physics, Institute of Mathematical Problems of Biology, Moscow State University, etc) as well as from LRB, FLNP, and LIT attended these workshops. The PAC was impressed by the workshops’ scientific programmes which reflected the present status and future possibilities of computer and molecular modeling in materials and life sciences.

Recommendation. The PAC recommends further regular holding of MSSMBS workshops.

VIII. Poster presentations

The PAC was pleased with the poster presentations by young scientists form LIT, DLNP, and BLTP in the fields of physics, biology, nanotechnology, and software development, and with the concluding reports by V. Ivanov and G. Mitsyn. The PAC appreciates the increased number of high-quality scientific reports and poster presentations and recommends that these activities be continued.

IX. Miscellaneous

The PAC asks the JINR Directorate to supervise the preparation of the PAC meeting materials in time and transmit them to all the PAC members. The PAC members will welcome other JINR materials, in particular those of the sessions of the Committee of Plenipotentiaries and of the Scientific Council.

X. Next meeting of the PAC

The next meeting of the PAC for Condensed Matter Physics will be held on 18–19 January 2010.

Its tentative agenda will include:

- Information of the PAC Chairperson on the report at the JINR Scientific Council session, and the implementation of the recommendations of the current PAC meeting
- Information of the JINR Directorate on the activities, especially in the field of scientific research, related to the International Innovative Nanotechnology Centre for CIS countries
- Overview of the research of nanosystems at FLNP and FLNR
- Reports and recommendations on the projects and themes to be completed in 2010 and consideration of new proposals and themes
- Status of modernization of the IBR-2 reactor
- Status reports on the modernization of FLNP instruments
- Visit to the IBR-2 reactor
- Scientific reports
- Poster session.

V. Kantser
Chairperson of the PAC