I. Preamble

The Chairperson of the PAC, V. Kantser, welcomed the PAC members, the *ex officio* members from JINR and the members of the JINR Directorate, and presented a short overview of the PAC report delivered at the session of the JINR Scientific Council in September 2010 and information about the implementation of the recommendations of the previous PAC meeting.

JINR Chief Scientific Secretary N. Russakovich informed the PAC about the Resolution of the 108th session of the JINR Scientific Council (September 2010) and the decisions of the JINR Committee of Plenipotentiaries (November 2010). The PAC is pleased to note that most of the recommendations of the previous PAC meeting concerning JINR research in the areas of condensed matter physics have been accepted by the JINR Scientific Council and Directorate.

II. Reports and recommendations on the projects and themes to be completed in 2011 and consideration of new proposals and themes

The PAC took note of the report presented by P. Apel on the concluding theme "Radiation Effects and Physical Basis of Nanotechnology, Radioanalytical and Radioisotope Investigations at the FLNR Accelerators" and the proposal for its extension for the period 2012–2014.

Recommendation. The PAC appreciated the high quality of the accomplished studies under this theme and recommends its continuation in 2012–2014.

The PAC noted with interest the report presented by V. Duginov on the new results obtained in the project "Investigation of the interaction of polarized muons with matter" (MUON) during the last three years. The PAC highly appreciates the high quality of the research and activity in this area, in particular the new results in magnetism and solids.

Recommendation. The PAC recommends approval of the MUON project.

III. Information on the physical start-up and first tests of the IBR-2 modernized reactor

The PAC was informed by A. Vinogradov about completion of the modernization of the IBR-2 reactor, on the physical start-up of the reactor and about the main objectives for 2011. It notes with great satisfaction that the physical start-up of the IBR-2 modernized reactor was begun according to the schedule.

Recommendation 1. The PAC recommends concentration of efforts on further work for the physical and the power start-ups of the IBR-2 modernized reactor in 2011 and on the start of user operation in 2012.

Recommendation 2. The PAC recommends active continuation of the work for a step-by-step construction of the complex of cryogenic moderators of neutrons at the reactor.

The PAC was informed by S. Kulikov about the current status of the construction of a cold neutron source at the IBR-2 modernized reactor.

IV. Status reports on the modernization of FLNP instruments and experiments initiated in 2011

The PAC took note of the analytical report presented by D. Kozlenko on the directions of the development of the spectrometers complex and neutron scattering techniques at the IBR-2 modernized reactor in 10-year perspective from the point of view of present-day possibilities of the synchrotron radiation sources. In the nearest future the neutron and synchrotron radiation scattering techniques will be complementary rather than competitive. The PAC notes that realization of the planned upgrade of the spectrometers complex, including both the construction of the new instruments and modernization of the existing ones, as well as development of neutron scattering techniques at the IBR-2 modernized reactor, is important for competitive scientific research in collaboration with JINR Member States and other countries in a long-term perspective.

Recommendation 1. The PAC encourages consideration of possibilities for complementing the use of neutron and synchrotron radiation scattering methods in realization of scientific research.

Recommendation 2. The PAC recommends completion of the basic configuration of DN-6, GRAINS, EPSILON-MDS and SKAT at the beginning of 2011 and regards this work as a major task of the re-start of experimental investigations in the area of neutron scattering. The PAC recommends monitoring the observance of the Topical Plan for JINR Research concerning the IBR-2 spectrometer complex.

The PAC was informed by M. Avdeev on the status of the GRAINS project on the construction of a new multifunctional reflectometer with horizontal sample plane at channel 10 of the IBR-2 modernized reactor.

Recommendation. The PAC approves the stage-by-stage realization of the project and expresses hope that the initial configuration of the instrument will start by the end of 2011.

The PAC took note of the report by Ch. Scheffzuek on the modernization of beam line 7A at the IBR-2 modernized reactor with two bent neutron guides and on the upgrade of the diffractometers EPSILON-MDS and SKAT. The report confirmed progress and suggested the installation of the neutron guide system to be completed in the second half of 2011.

Recommendation. The PAC recommends that the installation of the neutron guide and the chopper system at beamline 7A, as well as the modernization of the instruments EPSILON-MDS and SKAT, be completed before the start-up of the IBR-2 modernized reactor.

A. Balagurov informed the PAC about the possibility of developing a specialized neutron diffractometer at the IBR-2 modernized reactor, designed for the real-time investigations of irreversible processes in condensed matter. The PAC considers the development of such a diffractometer to be important in view of the present-day trends in the use of neutron scattering.

Recommendation. The PAC recommends working out the project of an RT-diffractometer and presenting it at the next PAC meeting.

The PAC was informed by D. Kozlenko about principles of the user policy concerning scientific research with the spectrometer complex of the IBR-2 modernized reactor. The PAC considers the realization of the user policy to be one of the most important activities not only for FLNP but also for the whole Institute.

Recommendation 1. The PAC expects that the re-start of the IBR-2 modernized reactor in 2011 and the first-stage implementation of the user policy at the spectrometer complex should promote further development and extension of competitive research in nanoscale physics and nanomaterials and other frontier fields of scientific study.

Recommendation 2. The PAC recommends launching a call for proposals of experiments at the reactor in November 2011.

V. Information on the special beam channel at the Nuclotron-M for medical and radiobiological experiments

The PAC took note of the report by S. Tyutyunnikov on the possibilities of using the accelerator complex Nuclotron-M for medical and radiobiological experiments. It was mentioned that the heavy-ion beams of the Nuclotron-M are unique tools for modeling biological effects of space radiation, for testing microelectronic devices for space programmes, and for the use in cancer therapy.

Recommendation. The PAC recommends continuation of the VBLHEP efforts for the creation of a special beam channel at the Nuclotron-M for medical and radiobiological experiments, in particular development of technical specifications and logistics.

VI. Educational programme

The PAC took note of the report by S. Pakuliak about the recent developments in the educational programme at JINR.

Recommendation. The PAC recommends further regular holding of international summer schools and student practical courses at JINR and of scientific schools for teachers of physics at JINR and CERN.

VII. Status of the JINR Grid activities and Grid environment of JINR Member States

The PAC took note of the report by V. Korenkov on the current status and results of the activities in the field of Grid technologies at JINR.

Recommendation. The PAC recommends continuation of these activities at JINR in close cooperation with Member States.

VIII. Scientific reports

The PAC heard with interest the following scientific reports on various fields of condensed matter physics: “Problems of Earth-based modeling human exposure to radiation during an interplanetary flight”, presented by V. Petrov, “Studies of nanostructured optically active materials by neutron scattering — cooperation with Belarus”, presented by S. Kichanov, “Radiation stability of nanocrystalline ZrN irradiated with 1.2 MeV/amu Xe ions”, presented by A. Sohatsky, and “Stochastic particle models of non-equilibrium statistical mechanics”, presented by A. Povolotsky. The PAC notes the high level of the presented reports and appreciates the quality of research at JINR.

IX. Information about scientific meetings

The PAC heard with interest the information presented by O. Belov about the 2nd Round Table Italy–Russia at Dubna on “Space Physics and Biology” (19–23 December 2010, Dubna). The PAC was impressed by the high level of this meeting and especially appreciates its results which reflected the present status and ample opportunities for Italy-Russia collaboration in astrophysics and biology.

The PAC was informed by Yu. Shukrinov on the International Conference on Theoretical Physics “Dubna-Nano 2010” (5–10 July 2010, Dubna). The PAC emphasizes a

number of top world standard contributions presented there which covered the vivid areas of nanoscale physics.

The PAC noted with interest information presented by A. Feoktistov on the All-Russian school for young scientists “Instruments and methods of experimental nuclear physics. Electronics and automatics of experimental facilities” (11–13 November, 2010) and All-Russian scientific school for young researchers “Modern neutron diffraction: fundamental and applied researches of functional and nanostructured materials” (25 October – 2 November, 2010, Dubna). The PAC highlighted a number of key studies in the fields of nanomaterials, nanotechnology, condensed matter physics and related areas which were covered by this school.

Recommendation. The PAC recommends further regular holding of the Round Table Italy–Russia at Dubna, International Conference on Theoretical Physics “Dubna-Nano” and of the mentioned all-Russian schools for young scientists in condensed matter studies.

X. Poster presentations

The PAC was pleased with the poster presentations by young scientists of the UC and DLNP in condensed matter physics research, and with the concluding report presented by R. Vasin.

The poster “A system for measurement of a therapeutic proton beam dose distribution” presented by A. Agapov was selected as the best poster at this session. The PAC also noted two other high-quality posters: “High pressure effects on the crystal and magnetic structure of $Pr_{0.7}Ca_{0.3}MnO_3$” by T. Tran and “Peculiarities of phase dynamics of coupled Josephson junctions in CCJJ and CCJJ+DC models” by I. Rahmonov. The authors of these papers will be awarded at the next PAC meeting.

Recommendation. The PAC selected the poster presentation “A system for measurement of a therapeutic proton beam dose distribution” to be reported at the next session of the JINR Scientific Council.

XI. Next meeting of the PAC

The next meeting of the PAC for Condensed Matter Physics will be held on 27–28 June 2011.

Its tentative agenda will include:

- Information by the PAC Chairperson on the report at the JINR Scientific Council session, and the implementation of the recommendations of the current PAC meeting

- Information by the JINR Directorate on the sessions of the Scientific Council (February 2011) and of the Committee of Plenipotentiaries (March 2011)
- Reports and recommendations on the projects and themes to be completed in 2011 and proposals for new themes
- Information by FLNP on the physical start-up of the IBR-2 modernized reactor
- Status reports on the modernization of FLNP instruments
- Draft scientific programme for investigations of consequences of space exposure and possible damages of biological objects and for estimating human health risks
- Scientific reports
- Poster session.

V. Kantser
Chairperson of the PAC