I. Preamble

The Chairperson of the PAC, V. Kantser, welcomed the PAC members, in particular the new member A. Steuwer, 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 February 2011 and information about the implementation of the recommendations of the previous PAC meeting.

JINR Acting Director M. Itkis informed the PAC about the Resolution of the 109th session of the JINR Scientific Council (February 2011) and the decisions of the JINR Committee of Plenipotentiaries (March 2011). 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.

The PAC extended congratulations to Professors M. Itkis and Yu. Oganessian on the award of the 2010 State Prize of the Russian Federation in science and technology for the discovery of a new region of stability of superheavy elements.

II. Recommendations on the themes to be completed in 2011 and on the new theme

The PAC took note of the report presented by S. Kulikov on the concluding theme “Novel Development and Creation of Equipment for the IBR-2M Spectrometer Complex” and of the proposal for its continuation for the period 2012–2014.

Recommendation. The PAC is pleased to note that all planned operations have been completed and recommends extension of this theme until the end of 2014.

The PAC took note of the report presented by D. Kozlenko on the concluding theme “Investigations of Nanosystems and Novel Materials by Neutron Scattering Methods” and of the proposal for its extension for the period 2012–2014. The PAC appreciates the high quality of the obtained scientific results and the broad cooperation with the JINR Member States in the realization of this theme.

Recommendation. The PAC recommends continuation of this theme until the end of 2014, using new improved facilities of the modernized reactor. The PAC strongly recommends the continuation of all activities to make the IBR-2 modernized reactor and its instrumentation most powerful and effective for the user community. However, the scientific topics of this theme should be more integrated and more focused in order to demonstrate the scientific performance.

The PAC took note of the report by E. Krasavin and G. Timoshenko on the concluding theme “Research on the Biological Action of Heavy Charged Particles with Different Energy” and of the proposal for its continuation for the period 2012–2016. The PAC notes the high scientific level of radiobiological and radiation research conducted by LRB. This research is very important for addressing the problems of space radiobiology, radiation medicine, and radiation protection of JINR's basic facilities and the environment.

Recommendation. The PAC recommends extension of this theme until the end of 2014.

The PAC took note of the proposal presented by G. Arzumanyan for the opening of a new theme “Nonlinear optical spectroscopy in condensed matter studies. Biomedical applications”, related to the laser confocal scanning CARS microscopy.

Recommendation 1. The PAC considers CARS microscopy as complementary to existing methods at JINR and welcomes investigations in this area.

Recommendation 2. For taking a decision concerning the opening of this theme, the PAC invites the authors of the proposal to present, at the next meeting, the detailed scientific programme and the financial plan of its realization.

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

The PAC discussed in detail the report by A. Vinogradov on the progress of work at the IBR-2 modernized reactor.

Recommendation 1. The PAC looks forward to the successful realization of the plan concerning the preparation for the regular operation of the reactor. It also expects that all the equipment of the reactor will be ready by the end of 2011 and that first test results will be reported at the next meeting.

Recommendation 2. The PAC recommends concentrating efforts and revealing the best set of parameters for the cryogenic moderator at the experimental stand, so that it could be possible to install the cryogenic moderator for neutron channels 7–11.

IV. Status reports on the modernization of FLNP instruments

The PAC took note of the report by I. Kalinin about the progress in modernizing the neutron inelastic scattering spectrometer DIN-2PI. The PAC notes the efforts being taken for the modernization of the first TOF base of the spectrometer and the arrangement of the multilayer mirror beam concentrator. The PAC especially notes the high importance of the effective functioning of the spectrometer in the framework of the user programme taking into account the deficit of inelastic scattering spectrometers and the possibility for

significant improvement of the spectrometer characteristics in case of use of the cold moderator on channel 2.

Recommendation. The PAC recommends finding the possibility for modernization of the measuring module of the DIN-2PI spectrometer taking into account its importance for the improvement of spectrometer functionality.

The PAC was informed by D. Kozlenko about the progress in constructing the DN-6 diffractometer. The PAC appreciates the activities in the realization of this first-priority task, which is under way according to the planned schedule.

Recommendation. The PAC considers that the completion of the basic configuration of the DN-6 by the end of 2011 should be one of the major tasks of the development of the reactor spectrometer complex.

A. Balagurov presented to the PAC the project of a new specialized neutron diffractometer, designed for the real-time *in situ* studies of irreversible processes in condensed matter (RTD Diffractomer). The PAC considers the construction of such a diffractometer to be important from the point of view of the present-day trends in the use of neutron scattering. The proposed schedule of construction and the draft budget is regarded as realistic and should be realized.

Recommendation. The PAC recommends approval of the RTD Diffractomer project for implementation in 2012–2015 with first priority and corresponding financial assistance from the JINR Directorate for instrumentation development, within the framework of the theme “Investigations of Nanosystems and Novel Materials by Neutron Scattering Methods”.

V. Scientific development

The PAC discussed the general development of condensed matter science and related infrastructure. The scientific topics should be better focused in order to demonstrate the strengths of JINR in-house research; they should also be targeted to the problems faced by society (energy, health, environment). Application driven research should have high priority and support. Existing links with universities, research institutes and industry have to be strengthened to attract innovative R&D.

Special efforts should be taken to improve the infrastructure and to deploy the user programme. This includes information on the instruments and methods (e.g. by on-line instructions and seminars), safety regulations and support during measurements and data evaluation.

VI. Scientific reports

The PAC heard with interest the following scientific reports on various fields of condensed matter physics and medicine: “Application of inelastic neutron scattering spectroscopy and molecular modeling for condensed matter studies” by A. Pawlukojć, “Specificity of the field emission from carbon nanostructures” by V. Katkov, “Experience in proton therapy at the JINR DLNP” by E. Luchin, and "Construction of nanoporous structures for solid-state hydrogen storage” by A. Guglya. The PAC appreciates the quality of research at JINR and notes the high level of the presented reports.

VII. Information about scientific meetings

The PAC heard with interest the information presented by I. Koshlan about the Round Table “Topical issues of radiation safety of long-term space flights” (50th anniversary of the first manned space flight) (25–26 April 2011, Dubna).

Recommendation. The PAC recommends supporting the initiative to establish an inter-institute radiobiological base at JINR for addressing experimental problems of providing the radiation safety of long-time space flights and conducting fundamental and applied research in general and space radiobiology. The LRB Directorate is asked to distribute among the PAC members the draft scientific programme in the field of space radiobiology by the end of 2011.

The PAC took note the information, presented by T. Ivankina about the International Conference “Stress and Texture Investigations by Neutron Diffraction” (6–9 June 2011, Dubna). The PAC appreciates the wide range of discussed problems on the application of neutron diffraction and supplementary experimental techniques on geosciences and material science.

Recommendation. The PAC recommends further holding of this thematic meeting.

The PAC took note of the Information on the SANS-YuMO User Meeting at the start-up of experiments at IBR-2 modernized reactor, dedicated to the 75th anniversary of the birth of Yu. Ostanevich (27–30 May 2011, Dubna).

Recommendation. The PAC highly appreciates the results of this meeting and recommends its further regular holding.

VIII. Poster presentations

The PAC was pleased with the poster presentations by FLNP scientists in the various fields of condensed matter physics and applications, and with the concluding report presented by R. Vasin.

The poster “Structure peculiarities of α-crystallin studied by small-angle neutron and X-ray scattering” presented by T. Murugova was selected as the best poster at the session. The PAC also noted two other high-quality posters: “The studies of structure aspect of optical properties forming in the optically active nanosystems” presented by S. Kichanov, and “Structure and properties of new analogs of halogenobismuthate (III) and halogenoantimonate (III) with morpholinium cation” presented by M. Owczarek. The authors of these papers will be awarded at the next meeting.

IX. Next meeting of the PAC

The next meeting of the PAC for Condensed Matter Physics will be held on 16–17 January 2012.

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 (September 2011) and of the Committee of Plenipotentiaries (November 2011)
- Reports and recommendations on the projects and themes to be completed in 2012 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
- Review of proposals of experiments at the IBR-2 spectrometers received since the call launched in November 2011
- Information about the user infrastructure at the reactor and its instruments
- Scientific reports
- Poster session.

V. Kantser
Chairperson of the PAC