I. Preamble

The Chair of the PAC for Condensed Matter Physics, D. L. Nagy, welcomed the PAC members, in particular, the new member S. Jabarov, the ex officio members from JINR and the members of the JINR Directorate. The Chair presented an overview of the implementation of the recommendations made at the previous PAC meeting concerning the JINR research in the area of condensed matter physics.

JINR Vice-Director L. Kostov informed the PAC about the resolution of the 137th session of the JINR Scientific Council held in February 2025 and the decisions of the Committee of Plenipotentiaries of the Governments of the JINR Member States in March 2025.

II. Current state of the IBR-2 reactor and report on the project "Development of the IBR-2 nuclear facility with a complex of cryogenic moderators" and subproject "Construction of a complex of cryogenic moderators at the IBR-2 facility"

The PAC took note of the report presented by E. Lychagin on the current state of the IBR-2 reactor and on the project "Development of the IBR-2 nuclear facility with a complex of cryogenic moderators" and subproject "Construction of a complex of cryogenic moderators at the IBR-2 facility".

The PAC noted with satisfaction the information on the successful resumption of operation of the IBR-2 reactor for users, the plans to prepare the reactor for the autumn-winter period of operation and the resumption of the FLNP User Programme. The PAC welcomes the inclusion of the Neutron Radiography and Tomography (NRT) facility in the FLNP User Programme, and considers it important to provide external users with access to all the instruments included in the FLNP User Programme as soon as possible.

The PAC took note of the current state of the complex of cryogenic moderators and considers the work on the development of a complex of two cryogenic moderators to provide cold neutrons to practically all IBR-2 research beamlines to be successfully completed. The PAC considers the decision of the FLNP Directorate to stop work on the third cryogenic moderator to be justified and agrees with the closure of the corresponding subproject.

Recommendations. The PAC recommends closing the subproject "Construction of a complex of cryogenic moderators at the IBR-2 facility" and the project "Development of the

IBR-2 nuclear facility with a complex of cryogenic moderators". The PAC also recommends continuing the FLNP efforts to attract new users of IBR-2.

III. First outcome of the spectrometer complex operation after restarting the IBR-2 reactor

The PAC was informed by D. Kozlenko about main results of the spectrometer complex operation renewed after restart of the IBR-2 reactor, aimed at justifying current technical parameters, completing modernization works and conducting first scientific experiments. The PAC appreciates the progress achieved in the upgrade of a number of the instruments, providing the improvement of technical parameters and extension of research possibilities. The current state of the spectrometer complex allows the realization of the FLNP User Programme to be renewed in autumn of 2025 at most of the instruments. The final launch of the new large aperture scintillation detector systems at the HRFD and FSD diffractometers is expected during 2025, and afterwards these instruments will also be available in the framework of the FLNP User Programme.

Recommendations. The PAC appreciates the work on the whole IBR-2 spectrometer complex already done. The PAC encourages the instrument team to continue with the full-scale implementation of the SANSARA instrument.

IV. Current state of the small angle neutron scattering spectrometer YuMO

The PAC considered the report by A. Ivankov about the current state of the YuMO small-angle spectrometer at Beamline 4 of the IBR-2 reactor. The PAC notes the high demand for the spectrometer and the importance of the scientific results obtained on it, published in highly rated journals.

Recommendation. The PAC supports further development of the small-angle scattering method at the IBR-2 pulsed neutron source. The PAC recommends continuing work on the modernization of the main parts of the YuMO spectrometer and supports the ongoing development plans for the sample preparation laboratory, including its modernization and expansion of capabilities.

V. Scientific reports

The PAC heard with interest the scientific reports "Magnetism and superconductivity in periodic and quasi-periodic low-dimensional layered systems" and "Conformational dynamics of amyloid-β42 in liposome under varying pH conditions: a combined

spectroscopic and computational approach", presented by V. Zhaketov and Y. Arynbek, respectively. The PAC thanks the speakers for their excellent reports.

VI. Meeting of the PAC members with JINR Directorate

The PAC appreciates the outcome of its meeting with the JINR Directorate.

Considering a broad spectrum of activities in life sciences being performed in several laboratories of JINR, the PAC shares the idea of the JINR Director G. Trubnikov, to establish a JINR interlaboratoratory STAC (Scientific and Technical Advisory Committee) for life sciences in order to facilitate the elaboration of a coherent and synchronized programme in this field of activity. The PAC took note of the opinion of the JINR Directorate that the main competencies of JINR, which could potentially be offered to the global life sciences community, should be focused on the development of unique facilities, providing a wide range of radiation modalities for experiments in biomedical research.

The PAC also took note of the information of the FLNP Directorate about issuing a book entitled "Directions of Scientific Research at the Advanced Pulsed Neutron Source at FLNP JINR". The PAC would like to receive an electronic copy of this book.

The PAC appreciates the level of international cooperation activity of JINR as presented by Chief Scientific Secretary of JINR S. Nedelko.

VII. Presentations by young scientists

The PAC reviewed 4 oral presentations made by young scientists in the field of condensed matter physics. The presentation "Automated segmentation of pores and cracks using a Unet3+ convolutional neural network on neutron, synchrotron, and X-ray tomography data" made by B. Bakirov was selected as the best presentation of the session. Its author will be awarded a diploma of the PAC.

Recommendation. The PAC recommends the presentation "Automated segmentation of pores and cracks using a Unet3+ convolutional neural network on neutron, synchrotron, and X-ray tomography data" to be presented at the session of the JINR Scientific Council in September 2025.

VIII. Next meeting of the PAC

The next meeting of the PAC for Condensed Matter Physics is scheduled for 19–20 January 2026.

The preliminary agenda for the next meeting of the PAC includes:

– report by the PAC Chair on the implementation of the recommendations above;

– report by the JINR Directorate on the sessions of the Scientific Council in September 2025 and of the Committee of Plenipotentiaries in November 2025;
– information about the IBR-2 operation and plans for the FLNP User Programme;
– status reports on the upgrade of FLNP instruments;
– information on the progress with the development of the new neutron source;
– report on the progress of the development of the new BJN spectrometer;
– information about scientific meetings;
– scientific reports (not more than three);
– presentations by young scientists.

D. L. Nagy

Chair of the PAC
for Condensed Matter Physics

O. Belov

Scientific Secretary of the PAC
for Condensed Matter Physics