

**Report of the Reviewer on the proposal for the opening of the new theme  
“Investigations of Functional Materials and Nanosystems by Neutron Scattering  
Methods”**

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The scientific theme 04-4-1121-2015/2020 “Investigations of Condensed Matter by Modern Neutron Scattering Methods” was realized successfully at FLNP during the period of last three years. The research activities in the frame of this theme were concentrated on the contemporary topics in the field of condensed matter physics and related interdisciplinary sciences, which attracted considerable interest of scientific community. The obtained scientific outcome consists of about 360 scientific articles, including those in highly ranked journals (Nature Communications, Scientific Reports by Nature Publishing Group, Physical Review B, Acta Materialia, Langmuir, Applied Surface Science, etc.), and more than 340 conference presentations. A number of achieved results were awarded with the First and Second JINR Prizes. The substantial progress has been reached in the development of the IBR-2 spectrometer complex.

The planned research activities in the framework of the new theme will follow the logic and develop scientific directions based on the achievements of preceding theme while taking into account current trends in a given research fields. These activities will include fundamental and applied studies of structure, dynamics and various properties of prospective functional and constructional materials, nanosystems including biological objects and polymers, rocks and minerals, non-destructive control and neutron imaging of bulk materials and products. The experimental studies will be performed at one of the main JINR experimental facilities - spectrometer complex of the modernized IBR-2 high flux reactor, which is ranked among the world most intense pulsed neutron sources. Traditionally, the research activities will be organized in a cooperation with numerous institutions from JINR Member, Associated Member and Non-Member States, and, of course, with the JINR Laboratories – BLTP, VBLHE, FLNR, LIT, LRB. These activities will be complemented by the User Programme, being realized effectively at the spectrometer complex of IBR-2 reactor.

The proposed programme of the development of the IBR-2 spectrometer complex will include a creation of the new small angle neutron scattering spectrometer. imaging installation and inelastic neutron spectrometer in inverted geometry, along with the upgrade of the available neutron scattering instruments. This programme is important for

extension of the research opportunities provided by the IBR-2 spectrometer complex and keeping it at the world level among other neutron centers.

The theme will be realized at the Department of Neutron Scattering Investigations of Condensed Matter of FLNP. The Department personnel are well known among the international neutron scattering community for their long standing experience in the field of the considered activities, supported by high quality publications, conference presentations, awards and prizes of different level. The Department has a large number of young scientists and specialists from JINR Member States.

Finally, I recommend realization of these activities at JINR and endorsing the opening of the new theme "Investigations of Functional Materials and Nanosystems by Neutron Scattering Methods" for a period of 5 years with the first priority.

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