

## 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 research under the scientific theme 04-4-1121-2015/2020 "Investigations of Condensed Matter by Modern Neutron Scattering Methods" was performed during the period of 2018-2020 at FLNP JINR. The scientific programme was concentrated on the actual topics of condensed matter physics and related interdisciplinary sciences. The obtained results are of high importance for a given research fields and they have world competitive level of research quality. This is confirmed by the list of more than 360 published scientific articles, including those in Q1 scientific journals (Nature Communications, Scientific Reports, Physical Review B, Journal of Physical Chemistry, etc.), and about 340 conference presentations. The results obtained in particular research topics were distinguished by the JINR Prizes. Significant efforts were made for the upgrade of the IBR-2 spectrometer complex, leading to improvement of technical parameters of the instruments and extension of research opportunities.

The plan of the activities within the new theme is based on the previous research advances and provides modified scientific programme with the focus on the actual fundamental and applied studies of structural, dynamical and other physical properties of advanced functional and constructional materials, nanoobjects, soft condensed matter, non-destructive control and neutron tomography and radiography of bulk materials and products. The scientific experiments will mostly be made at the home experimental base - complex of the spectrometers of the IBR-2 high flux reactor. The broad cooperation with numerous research organizations from JINR Member and Associated Member States, as well as other Laboratories of JINR will be continued. The important addition to the scientific research programme is the User Programme, providing wide prospects for further extension of the research cooperation.

The planned activities of the development of the IBR-2 spectrometer complex constitute of the modernization of the operational spectrometers, and also development of new instruments and neutron scattering techniques. The realization of these activities enables supporting the IBR-2 spectrometer complex at the competitive level among the other advanced neutron centers in the world and this is in line with the trends in development of neutron instrumentation. The proposed schedule of the methodical activities and requested financial sources are adequately formulated.

The activities of the new theme will be performed generally in the Department of Neutron Scattering Investigations of Condensed Matter of FLNP. The staff of the Department is sufficient and well skilled. It has a significant experience in all of the considered activities, which is supported by large list of publications in well-recognized scientific journals, conference reports, prizes and awards. The young scientists and specialists, including those from JINR Member States, are essential part of the Department staff.

Based on above, I definitely recommend to endorse the opening of the theme "Investigations of Functional Materials and Nanosystems by Neutron Scattering Methods" for a period of 5 years with the first priority starting from 2021.

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