Review on the project
"Open information and educational environment for supporting fundamental and applied multidisciplinary research at JINR"

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The Joint Institute for Nuclear Research is constantly developing and implementing new world-class projects in the field of fundamental and applied multidisciplinary research. For the successful implementation of these projects, it is necessary to attract young scientists and engineers from the JINR Member States. One way of realization of this task is to create an open information educational environment using modern information and communication technologies.

The JINR University Centre has been successfully implementing this task over the past few years. I was a reviewer of the previous project of this group of authors and I can note with satisfaction that all the stated goals of the previous project have been achieved. I would like to pay the special attention to the following results:

- The JINR Educational Portal with the learning management system has been created. It has already hosted courses on JINR topics created in the most popular format – in the format of open online courses. This will allow to use these courses at various universities and research centers of the JINR Member States.
- Large amount of attention in the project is paid to cooperation with Frank Laboratory of Neutron Physics. The official FLNP website (flnph.jinr.ru), the information system of the laboratory (flnp.1gb.ru), the User Club System of IBR-2 Reactor (ibr-2.jinr.ru), promotional videos for the Department of Neutronography of Moscow State University and the Department of Materials Science of Kazan State University were created. This is a significant contribution of the authors of the project to the research topics of the Programmé Advisory Committee for Condensed Matter Physics.
- One of the significant achievements of the previous stage of work is the creation of the software and hardware aggregate called "Virtual Laboratory for the Study of Nuclear Physics". Sofia University and the Institute of Nuclear Research and Nuclear Energy of the BAS are actively involved in this work. I would especially note that the virtual practicums, created within the framework of the project,are included in the curriculum of the Physics Department of Sofia University.

The new project proposed for review will allow not only to extend the range of tasks to be solved, but also to realize them at a qualitatively new level using the latest information and communication technologies.

1. It is planned to create new courses in the fundamental and applied areas of JINR research, which will be prepared by leading specialists who are directly involved in key experiments. It is very important to consider how to provide the possibility to use these courses in the curricula of

universities of the JINR Member States and how to publish on international open education platforms.

2. I especially want to support the direction of the project related to the development of virtual, hands-on and distance practicums in nuclear physics. It is very good that along with created practicum on the study of spontaneous fission, a practicum on gamma spectroscopy and a laboratory for detectors and signal processing are being developed. A significant progress of the previous stage of work is the creation of a hands-on practicum for university- and high school students. The relevance of this part of the work is confirmed by the fact that practices have already been conducted for students from Israel, Germany, the Czech Republic, South Africa, Serbia, and Belarus. It is very important that within the framework of this project the topic of hands-on practicum will be extended. I especially want to pay attention to the creation of a platform for the development and uploading of remote laboratory works. The proposed platform will allow to organize joint project work and combine the contribution of various universities in the development of non-standard laboratory works with elements of scientific research, what is very important for the training of modern physics engineers.

3. It is very important for the participating countries to create the opportunity to learn about the activities of JINR, as an international scientific organization. For example, CERN, as an international European organization, pays great attention to the popularization of its activities in various countries, including countries that are both members of CERN and JINR. Therefore, the fact that the authors of the project propose the creation of JINR's exhibition for its exposition in Dubna and JINR member-states, in my opinion, one of the most important tasks of this project.

4. To attract talented students to the physics departments of universities it is very important to provide teachers with an opportunity to use the information about the latest breakthroughs in science and technology in the course of school Physics. For this, international schools for physics teachers are held in Dubna and CERN. I want to emphasize that the project proposes the creation of multimedia educational resources for teachers and high school students.

In conclusion, I want to stress the high scientific significance of the proposed project, its relevance and novelty.

The team of authors has long-term experience in creation of multimedia educational resources, laboratory practicums, and exhibitions. There is no doubt that the results announced in the project will be achieved in the declared timeline.

The list of project authors shows that the project is well provided with human resources.
I believe that the requested financial resources correspond to the objectives of the project.

I believe that the project "Open information and educational environment for supporting fundamental and applied multidisciplinary research at JINR" is an important area of activity for JINR and its Member States. I propose to support it with the first priority and funding allocation in full.

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