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REVIEW

of the closing first-priority theme 06-0-1120-2014/2018

"Organization, Support and Development of the JINR Educational Programme"

and opening of the new theme

"Organization, Support and Development of the JINR Human Resources Programme"

for the period 2019-2023

The JINR University Centre (UC) performed its activities during 2014-2018 in the following directions:

1. Support and maintenance of the educational process at JINR-based departments of Russian universities.
2. Organization of students and postgraduates' exchanges regulated by separate agreements.
3. Support of the system of assigning young engineers and researchers to JINR laboratories for preparation of PhD theses without mastering the academic programmes of PhD courses.
4. Organization and running of Summer Students Practices in JINR fields of research for students of higher-education institutions.
5. Participation in the organization and running of international schools on nuclear physics and particle physics for young scientists.
6. Expansion of the research projects of the International Summer Student Practice at JINR and the number of participants of this programme.
7. Development of the training facilities for practice in the framework of a UC-based scientific and engineering group.
8. Development of the computer infrastructure for organizing and conducting training programs for data analysis in high-energy physics experiments and for the design of modern physical facilities.

9. Improvement of the training laboratory and Interschool Physics and Mathematics Open Classroom courses for the organization of lectures and practical classes in physics for high-school students.
10. Organization of scientific schools for teachers of physics from the Member States at CERN and JINR.
11. Organization of the excursions to JINR and video-conferences for high-school students and teachers from the Member States.
12. Development of the system of teaching Russian, English, French, and German for JINR staff.
13. Development of training and educational programmes in nuclear and particle physics.
14. Dissemination of information on the Virtual Laboratory of Nuclear Fission in the Member States.
15. Support of the licensed system of the JINR staff professional development courses.

To provide the educational process, the UC offers about 100 lecture courses per year for the students of JINR-based departments. These courses may be attended by the students who arrive to JINR to prepare their qualification works and have to perform their individual educational plans. Each year about 150 students of bachelor, master or PhD students prepare their qualification works under the supervision of JINR scientists.

The UC is a co-organizer of a number of international events for students and young scientists. The international summer student schools on neutrino physics in memory of Bruno Pontecorvo were organized in 2015 in Slovakia and in 2017 in Czech Republic. In the same years two student schools under the title "Nuclear Physics - Science and Application" were organized in Poznan, Poland and Brashov, Romania. In April 2018, the International School "Nuclear methods for Environmental and Life Science" was organized in Budva, Montenegro, for the students and postgraduates from the South-East European countries. About 50 students and young researchers participated in each of these schools.

During the reporting period 2014-2018 the UC has annually organized 3

stages of the International student practices. More than 150 students from Republic of South Africa, Czech Republic, Poland, Slovakia, Bulgaria, Romania, Azerbaijan, Egypt, Serbia, Cuba and Belorussia each year attend three-weeks-long practice where they get acquainted with the JINR laboratories. For some of these students this Practice becomes a starting point of their scientific career at JINR.

Since 2014 the Summer Student Programme at JINR has been working in the frameworks similar to CERN Summer School. The students apply through the website students.jinr.ru and JINR scientists select proper participants of the Programme according to the motivation and recommendation letters provided in the application. Being selected students have a chance to stay at JINR from 6 to 8 weeks and perform a reasonable research project which may be a starting point of their bachelor or master thesis. About 200 students from all over the world have become the participants of this Programme since 2014.

The UC carries out the activities oriented to the most talented secondary school pupils from the JINR Member States to draw their attention to study physics and to begin a scientific career at JINR. Physics teachers from JINR Member States have a possibility to visit JINR and CERN during teacher programmes organized jointly with CERN and visit JINR with their classes for extended excursions. Since 2014 the UC has annually organized the Physics Days and competitions in Robotics in Dubna to attract pupils to natural sciences and engineering.

By the decision of CPP session March 2014, the scientific-engineering group was founded at the JINR UC to implement and conduct the training programmes for the physicist-engineers. This group works with a small electron accelerator which can be used to train students in different aspects of the accelerator physics. A big set of laboratory works and practices in electronics, detectors, vacuum techniques and automatization was developed during the reporting period.

In 2014-2016 as a part of the theme 1120 a project "Development of modern education programmes" headed by Prof. Yu.A.Panebratsev was realized. The main goal of this project was to include modern scientific results into

the student's educational process. The virtual laboratory of nuclear fission (v-labs.ru) was developed in the framework of this project. JINR UC approved the new project as part of the theme 1120 "Development of an open educational environment to support research priorities in material science and structure of matter" for the period 2017-2019 and this project will be continued in the framework of the new JINR Human Resources Programme.

Czech Republic (CR) is active Member State of JINR and we fully support all activities and even further extension of UC. We highly appreciate the results of UC effort towards young students and early stage researchers, which is crucial for future development of JINR. CR actively participates mainly in summer practices (every year 20-25 students from Czech universities visit JINR) and summer schools. Two special agreements concerning of research education of PhD students in JINR were signed (16 PhD or diploma students at JINR, 5 students from JINR in CR). At present, 16 students from CR are in the staff of JINR. This year our cooperation with UC is extended by participation of teachers of physics from secondary schools as a pilot programme for CR. Next year the theme of physical Olympics (national competition of young students from secondary schools) was accepted as 150 years anniversary of Mendeleev periodic table. Therefore, the competition is concentrated on synthesis and decay properties of superheavy elements, which is performed at JINR. The winners of the physical competition will receive the possibility to visit JINR and be more familiar with such research. Finally, I would like to emphasize that the role of UC in all the above mentioned activities is crucial.

I suggest the JINR University Centre's work on realization of first-priority theme 06-0-1120-2014/2018 **"Organization, Support and Development of the JINR Educational Programme"** to be considered successful. I would like to support opening of the new theme **"Organization, Support and Development of the JINR Human Resources Programme"** for the period 2019-2023.

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