

Preface

The XXIV International Baldin Seminar on High Energy Physics Problems "Relativistic Nuclear Physics and Quantum Chromodynamics", organized by the Joint Institute for Nuclear Research was held in September 22-27, 2018 at Dubna, Russia (<http://relnp.jinr.ru/ishepp-xxiv/>). The Seminar was supported by the Russian Foundation for Basic Research (RFBR) and the International Union of Pure and Applied Physics (IUPAP).

In 2018 the Seminar united a record number of participants - 259, 73 of them were young physicists. The total number of reports was 183, including 47 of the plenary ones. The Seminar was attended by scientists of JINR and CERN and from 22 countries: Armenia, Azerbaijan, Belarus, Bulgaria, Brazil, Germany, Iran, Italy, Kazakhstan, Moldova, Mongolia, Poland, Russia, Slovakia, USA, Ukraine, Uzbekistan, France, Czech Republic, Estonia, Japan.

The Seminar was opened by the Director of the JINR Academician V.A. Matveev, who stressed that the Seminar had been initiated by Academicians A.M. Baldin and M.A. Markov in 1969. Among physicists, it is called "Baldin autumn". In his speech, V.A. Matveev described the leading role of A.M. Baldin in the development of relativistic nuclear physics at JINR. He also emphasized the importance of these Seminars to develop science at JINR and support such projects as NICA. In conclusion, he wished the participants to enjoy exciting scientific discussions to crown the successful work of the Seminar.

On behalf of the city administration the Mayor of Dubna M.N. Danilov wished pleasant days and fruitful work for the participants of the Seminar. He emphasized that the city administration tried to do their best to maintain and develop the infrastructure of the city to provide the necessary conditions and friendly atmosphere for scientists in Dubna.

Director of the Laboratory of High Energy Physics V.D. Kekelidze in his speech stressed the high assessment given to the Seminar by the International Union of Pure and Applied Physics, wished interesting reports and useful discussions for the participants of Baldin Autumn Meeting.

A characteristic feature of the Seminar was that the given reports had been presented by almost all known physical collaborations in the world. At the Seminar, the section on the tasks related to the NICA project at JINR was successfully held.

A large number of reports concerned methodological developments carried out within the framework of the NICA project. A special section of the Seminar was dedicated to the study of exotic nuclei in relativistic beams. Reports at the section on polarization phenomena and spin physics were listened to with a special interest and actively discussed. This interest was caused by a number of reports related to the Nuclotron run with the polarized deuteron beam performed in 2017.

The reports of many young scientists were given at a high scientific level and demonstrated good communication skills of the speakers. This concerned both a large number of results on modeling experiments on the NICA collider and the analysis of the data obtained at the Nuclotron and in international collaborations.

At one of the meetings of the Seminar, Dr. A. Zarubin presented a book by Italian physicists A. Nisati and G. Tonelli "The discovery of the Higgs Boson at the Large Hadron Collider" translated into the Russian language.

Traditionally, the concluding plenary session contained reviews of the most urgent problems not only in high energy physics, but also on "Quantum dots" and studies of superheavy elements in Dubna.

The JINR Scientists House organized a wonderful concert of classical music performed by winners of international and Russian competitions for the participants of the Seminar.



As part of the social program the participants of the Seminar attended the New Jerusalem Monastery (the town of Istra) and enjoyed the excursion on the history of this place and its reconstruction.

We expect that the Proceedings of this Seminar will be interesting for scientists working in the relativistic nuclear physics. The next XXV Seminar will be organized on September 14-20, 2020 and we hope that the scientific program will be even more intriguing and interesting because of the progress of the relativistic nuclear physics and operation of the new accelerators.

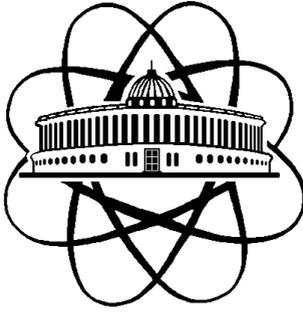
We express our deep gratitude to Svetlana Chubakova, Elena Rogochaya, Lidia Belova, Alexandru Parvan, Aidos Issadykov, and Alexey Gladyshev for the help in the preparation of these Proceedings.

S.G. Bondarenko

V.V. Burov

A.I. Malakhov

September 2018, Dubna



JOINT INSTITUTE FOR NUCLEAR RESEARCH
**XXIV INTERNATIONAL BALDIN SEMINAR
ON HIGH ENERGY PHYSICS PROBLEMS**

*RELATIVISTIC NUCLEAR PHYSICS
& QUANTUM CHROMODYNAMICS*

Dubna, Russia, September 17-22, 2018

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XXIV INTERNATIONAL BALDIN SEMINAR ON HIGH ENERGY PHYSICS PROBLEMS RELATIVISTIC NUCLEAR PHYSICS & QUANTUM CHROMODYNAMICS



SEPTEMBER 17–22, 2018



DUBNA, RUSSIA



Seminar Topics

- Quantum chromodynamics at large distances
- Relativistic heavy ion collisions
- Hadron spectroscopy, multiquarks
- Cumulative processes
- Structure functions of hadrons and nuclei
- Multiparticle dynamics
- Polarization phenomena, spin physics
- Studies of exotic nuclei in relativistic beams
- Applied use of relativistic beams
- Accelerator facilities: status and perspectives
- Project NICA/MPD (Nuclotron-based Ion Collider Facility/ MultiPurposed Detector) at JINR
- Progress in experimental studies in high energy centers — JINR, CERN, BNL, JLAB, GSI, etc.

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