PREFACE

The road map for the strategic development of the Joint Institute for Nuclear Research is a plan designed to maximize the significance and impact of the future JINR scientific programme by allocating resources to the most promising scientific research directions, achieving effective and long-term realization of the intellectual potential and accumulated knowledge of the Institute. The realization of this plan is possible due to the present financial and economic conditions at the Institute which are more stable than in recent years.

The attractiveness of JINR as an international, intergovernmental research centre is due to a number of factors, chief among which is its scientific programme. This programme, on the cutting edge of world-wide trends in fundamental nuclear science research, is competitive and attractive due to the availability of modern JINR experimental facilities which make it possible to raise scientific exploration to a qualitatively new level. These key factors, together with the historically prevailing tradition of excellence in three main scientific directions at JINR (high-energy physics, nuclear physics, and condensed matter physics), as well as the interests of the JINR Member States provide the basis for the road map developed by the JINR Directorate and endorsed by the scientific community of JINR, by its Programme Advisory Committees and Scientific Council and approved by the JINR Committee of Plenipotentiaries in 2006. The road map is an important "living" document. It will be periodically updated (every 2-3 years) with the purpose of concentrating human and financial resources on realization of the most scientifically meaningful research projects, primarily concerning basic natural phenomena. The full scope of the vision addressed within the road map includes prospects for the development of the JINR scientific directions spanning a period from 10 to 15 years. Taking into account the possibility of making subsequent updates, this provides a solid foundation for planning medium-term and long-term development.

At the same time it is well known that basic research, together with professional education, is the starting point of science-intensive technological developments. It is for this very reason that a three-pronged thrust, "**research–innovations–education**", has been adopted as the basis of the concept of JINR's future development. This current scientific policy of the Institute is regarded as contemporary and adequate to the strategy of the economic development of practically all the JINR Member States. We are confident that, along with the solution of some important social problems (affordable housing and competitive salaries for the staff), this policy will address a vital need of the Institute — the involvement of young talented scientists in the activity of JINR.

The first stage of the effort envisioned by the road map will be renovation of the scientific and innovational infrastructure of JINR beginning with the upgrade of the JINR basic facilities and the start of construction of new facilities central to realization of the future scientific programme. A major portion of this work began in 2006, with the full scope expected to be complete by 2010. When it is finished, the Institute will possess a fully modern suite of accelerators capable of addressing a broad spectrum of research interests: Nuclotron-M, the Complex of Dubna Radioactive Ion Beams (DRIBs-II), the fully upgraded reactor IBR-2M, and the IREN source of resonance neutrons.

In parallel with the ongoing upgrade programme for the basic facilities, JINR has already started the development of a new accelerator complex for high-energy heavy ions — NICA (Nuclotron-based Ion Collider fAcility) — and of a dedicated MultiPurpose Detector (MPD). The construction of this collider is planned to be completed in 2014. Its scientific mission will be to study nuclear matter under extreme conditions which may have occurred in the early stages of the evolution of the Universe and which may occur today in the process of neutron star formation. The necessary conditions will be achieved in the laboratory through collision of relativistic heavy ions. The importance of the detection and investigation of such states of nuclear matter for basic science can hardly be overestimated. NICA can become one of the world's most attractive projects in the field of heavy-ion physics at relatively high energies (5-40 GeV per nucleon in the laboratory coordinate system). This will bring the JINR international centre to the front edge of this scientific line of research, complementing JINR's leading position and outstanding achievements already recognized in the field of low-energy heavy-ion physics (in particular, in experiments on the synthesis of superheavy elements). During the years 2011–2015, a plan to construct a new-generation accelerator complex — DRIBs-III to upgrade capability in this line of scientific inquiry is also envisioned.

Thus, we can note that the logic and traditions of the development of this Institute have formed around the main lines of its scientific activities: basic research in the fields of heavy-ion physics at high and low energies, and condensed matter physics using nuclear physics methods. For the latter, in particular, a complex of state-of-the-art neutron spectrometers will be created around the modernized reactor IBR-2M during 2010–2015.

The entire experimental research programme of JINR will continue to be supported by its excellent school of theoretical physics, by the well-developed methods of physics experiments, and by modern information technology, including GRID technologies that are being vigorously developed.

After achieving the milestone of upgrading the basic facilities by 2010, there will be an intensive period of compelling scientific research work at the JINR home facilities. This research will be carried out within the framework of partnership programmes which are already being prepared together with Member States and with other large research laboratories world-wide. This is a new approach in JINR's scientific policy in the area of international cooperation. It has been dictated by the realities of the present time: collaborations should be fundamentally international and bilateral and with mutual benefit for all research stakeholders.

Along with the in-house research activities, JINR will continue its participation in large projects, such as the LHC, and in the experimental programmes at the accelerators RHIC and Tevatron. The JINR groups have also joined in developmental work for the international projects FAIR and XFEL. Today, Dubna has been chosen as one of the five official candidates for the construction in the territory of the Moscow Region of the international liner collider ILC, a megaproject of the 21st century.

Maintaining fundamental science as the basis of its activity, JINR — in the area of high tech developments — is smoothly shifting its activities within the "innovation belt" around the Institute to promotion of modern science-intensive developments in the technological-and-innovative special economic zone in Dubna (this status was granted to Dubna in December 2005 by decision of the Russian government). It is evident that Dubna has rightfully won the competition for establishing a special economic zone of this type. As shown by the successful experience in other countries, there are sound and promising reasons to build such economic zones near large research centres creating powerful scientific and technological potential. At its accelerators and reactor, JINR is conducting both fundamental research to study the structure of matter and applied investigations. It is also carrying out innovative developments of a wide profile: radiation-ion nanotechnology, nuclear medicine, atomic spectrometers for safety monitoring, etc. This entire range of activity is supported by modern information technology. Gradually by the year 2015, we are planning to introduce GRID technology at JINR as well as to provide high-quality and high-performance computer communication links with major partners in the JINR Member States for ensuring effective processing and analysis of new experimental data.

We are also working actively in order to establish, based at JINR and at the special economic zone in Dubna, a Multi-Access Centre for Nanotechnology oriented to cooperation with countries of the Commonwealth of Independent States and other states — partners of JINR.

The Educational Programme of JINR will further be developed based on the activities of its University Centre, of the International University "Dubna", and of the Dubna-located specialized

chairs of Moscow State University, Moscow Engineering Physics Institute, Moscow Institute of Physics and Technology, Moscow Institute of Radio Engineering, Electronics and Automation, and other institutions of higher learning in the Members States.

In conclusion, I would like to note that the example of JINR, as a modern international model for the collaboration of scientists, has already convincingly demonstrated to the world the attractive force of scientific knowledge and the unprecedented strength of the ties that unite the scientific community. I would also like to express my confidence that the future development of JINR in accordance with the strategic goals, outlined in the present road map, will make our Institute even more attractive for participating Member countries and will enable JINR to attract new strong research partners into the orbit of its international scientific collaboration.

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