### I. General considerations

The Scientific Council notes the information presented by JINR Director V. Kadyshevsky concerning the decisions taken by the JINR Committee of Plenipotentiaries at its March 2005 session. Specifically:

– the approval of the activity of the JINR Directorate during 1992–2004 aimed at preserving and developing JINR as a leading world centre of fundamental and applied research and of education of young scientists in the relevant areas of knowledge;

– the approval of the JINR Topical Plan of Research and International Cooperation for 2005 based on the recommendations of the Scientific Council and the PACs;

– the support of the efforts undertaken by the Directorate to concentrate available financial and human resources on the most important directions of research;

– the approval of the Directorate's plans to participate in innovation activities;

– the election of A. Sissakian as the new Director of JINR for a term of five years, in accordance with the Institute's Charter, beginning January 2006.

The Scientific Council congratulates Professor A. Sissakian and wishes him success in his leadership of the Institute.

The Scientific Council thanks Professor V. Kadyshevsky for his successful leadership during 13 years as Director of JINR. His outstanding contributions to the development of JINR and of its scientific and technological cooperation with research institutions of the Member States and of other countries are highly appreciated. The Scientific Council strongly supports the recommendation of the Committee of Plenipotentiaries that the new Director find an appropriate means to recognize Professor V. Kadyshevsky's meritorious service to JINR.

### II. Recommendations for the road map of JINR's future research programme

In response to its previous recommendation, the Scientific Council was informed by Vice-Director A. Sissakian about the first proposals concerning the development of a road map to achieve the strategic goals of the Institute's research programme for the coming 10 years as the next step in the planning process initiated with the current seven-year scientific programme. The Scientific Council endorses these proposals, as elaborated by the Institute's Directorate and discussed by the internal scientific councils of JINR and its laboratories as well as at the April meetings of the PACs, and considers them as a good basis for further development.

The Scientific Council recommends continuation of this work, and specifically that the road map include the impact of the various themes and projects, their relevance to the interests of the international scientific community, and the assumptions made concerning manpower and funding profiles for the future. The road map should document a strategic plan to maintain JINR's leading role as a competence cluster in Dubna which is highly attractive for participation by the JINR Member States. The road maps of the Institute laboratories should be also presented at the Scientific Council sessions in order to assess the role to be played by each laboratory.

The Scientific Council invites the JINR Directorate and experts to develop proposals concerning the development of the Institute's future scientific basis, including possible megaprojects such as the International Linear Collider (ILC), which obviously has great importance for the long-term future of JINR. Megaprojects for new facilities and experiments should, however, be a matter of detailed consideration by the Scientific Council.

The Scientific Council asks the Directorate to present an updated draft road map at the next session, including a compact review of group sizes and budgets.

The Scientific Council considers that a larger level of funding is needed for achieving the goals of the draft road map as presented. It asks the Committee of Plenipotentiaries to consider the question of increasing the Institute's budget, particularly in view of the inflation in costs and salaries that have not been compensated for many years.

The Scientific Council recommends that the JINR Directorate establish contact with the European Strategic Forum for Research Infrastructures (ESFRI) in order to inform each other regularly about the European and JINR infrastructure road maps in the interest of harmonizing these plans. The Scientific Council suggests that the Directorate invite the ESFRI Chairman, J. Wood, to its 99th session.

**III. Recommendations on the JINR basic facilities**

The Scientific Council takes note of the information on the operation of the JINR basic facilities presented by JINR Chief Engineer G. Shirkov, and appreciates the stable operation of these facilities.

Concerning the construction of the IREN facility, the Scientific Council insists that all problems with this project must be clarified as soon as possible. At its next meeting, the PAC for Nuclear Physics should discuss IREN construction in the context of a realistic plan of investment, requested by the Scientific Council at the previous session, the necessary human resources, and a realistic scientific programme that takes the contemporary

international context into account. The Scientific Council requests a report on the IREN project, based on the conclusion of the PAC, for the next session

The Scientific Council notes, with regret, the fire accident that occurred in the experimental hall adjacent to the Phasotron, and recommends that the DLNP Directorate undertake a strong effort to recommission the Phasotron and to recover the beamline to the Hadron Therapy Complex as soon as possible.

The Scientific Council was informed about the status of Linac 800 (first part of DELSY), and asks the corresponding PACs to discuss (i) how the construction of this linear accelerator will be completed, (ii) what kind of instrumentation, including free-electron lasers, are planned, and (iii) whether these developments have been justified by a sound scientific case that fits within the JINR road map.

**IV. Recommendations in connection with the PACs**

The Scientific Council concurs with the recommendations made by the PACs at their April 2005 meetings and reported by Professors T. Hallman, N. Janeva, and W. Nawrocik.

Common Issues

At their meetings, the PACs began considering the proposals from the laboratories on the adjustment of the respective research programmes being prepared for 2006 and beyond, in accordance with the available financial and human resources. The PACs also discussed first proposals concerning the road map of the Institute's research programme in the fields of particle physics, nuclear physics, and condensed matter science. The Scientific Council asks the PACs to finalize this work at the November meetings and looks forward to presentations on the results of this activity at the next session.

Particle Physics Issues

The Scientific Council is pleased to note the first steps taken to streamline the Programme of Particle Physics Research in order to focus it on the most important physics topics. It concurs with the PAC's recommendations to close 14 activities (themes and projects) as indicated in the PAC report. At its next meeting, the PAC expects to consider, based on the information by the Laboratory directors, which projects are suggested to be closed in 2006 and 2007.

The Scientific Council recognizes the significant achievement made in developing the Nuclotron accelerator complex during the last few years; in particular, the increase of the energy of accelerated particles, progress towards increasing the intensity of polarized deuterons, and further development of the cryogenic system. The Scientific Council supports the PAC's recommendation concerning the need to prepare a written detailed

plan for upgrading the capability of the Nuclotron in the future; for example, for the development of high-intensity heavy-ion beams up to the highest energy provided by the design of the Nuclotron. It also looks forward to a report about future physics at the Nuclotron.

The Scientific Council supports the recommendations of the PAC on the new project "Astrophysical studies in the NUCLEON space experiment", on the new theme "Study of $e^+e^-$ interactions, linear collider physics and detector", on including R&D study for the preparation of the PAX project as an additional item of the theme "Investigations at the GSI accelerator complex", and on the continuation of the current activities beyond 2005, as outlined in the PAC report.

The Scientific Council looks forward to hearing more details of the linear collider plans discussed by the PAC, and would also like to be informed about plans for neutrino experiments at a future session.

The Scientific Council is pleased to note that the obligations undertaken by JINR for the preparation of the ALICE, ATLAS, and CMS detectors for the experiments at the LHC have been successfully met and appreciates the role of the Institute Directorate in achieving this important goal. The Scientific Council would welcome a more active involvement of BLTP theoreticians in the preparation of the research programmes planned at the LHC.

The Scientific Council strongly supports the wish of the PAC to hear a report at its next meeting concerning the software and computing efforts being actively undertaken to allow JINR scientists to produce first scientific results at the time of LHC start-up.

Nuclear Physics Issues

The Scientific Council is pleased to note the recent achievement of the Flerov Laboratory in obtaining two additional events in the Z=118 experiment, and looks forward to successful continuation of the superheavy-element research programme.

The Scientific Council notes that the first experiments carried out at the DRIBs complex have demonstrated a large potential for research with accelerated secondary beams and supports the research programme with $^6$He beams with first priority.

The Scientific Council notes with interest the new results obtained in the MUON experiment during the last three years.

The Scientific Council is pleased to note the completion of the design stage of the SAD project, targeted on creating a facility to address important problems of modern nuclear energy production and waste transmutation. It encourages collaboration between this project and European and other transmutation projects already in progress.

The Scientific Council supports the recommendation on the approval, with highest priority, of the new project GERDA–MAJORANA on the search for neutrinoless double-beta decay of $^{76}$Ge.

The PALM experiment, aimed at an improved lifetime measurement of parapositronium, should be approved as outlined in the PAC report.

Condensed Matter Physics Issues

The Scientific Council is pleased to note that the full budget required for the modernization of IBR-2 in the period 2004–2005 was provided in a timely way, enabling the completion of the commissioning of the new movable reflector on schedule. The Scientific Council expects that the planned financial support for this activity will continue until the IBR-2 modernization is complete.

The Scientific Council supports the general statement of the PAC that condensed matter science, including life sciences, appears to be a fast developing field of world research activity.

The Scientific Council welcomes the rapidly growing activity on the theme “Radiation Effects and Modification of Materials, Radioanalytical and Radioisotopic Investigations at the FLNR Accelerators”.

## V. Memberships of the PACs

As proposed by the JINR Directorate, the Scientific Council appoints V. Petrov (IMBP, Moscow, Russia) and F. Spurný (NPI, Prague, Czech Republic) as new members of the PAC for Condensed Matter Physics, and appoints S. Hofmann (GSI, Darmstadt, Germany) as new member of the PAC for Nuclear Physics for a term of three years.

The Scientific Council thanks Professors S. Kozubek, G. Münzenberg, and P. Spillantini for their very successful work as members of the PACs for Condensed Matter Physics, for Nuclear Physics, and for Particle Physics, respectively.

## VI. Recommendations concerning the radiation biology research at JINR

The Scientific Council takes note of the report on the current and planned research programme in the field of radiation biology presented by E. Krasavin, Head of the Division of Radiation and Radiobiological Research (DRRR), as well as of the intention to reorganize DRRR into a Laboratory of Radiation Biology (LRB). The main goal of this programme is simulation of the effect of heavy charged particle radiation from the Galaxy in experiments at the Nuclotron and studies of the biological effectiveness of the carbon ion beam at the Med-Nuclotron channel with the aim of developing an effective cancer therapy.

Considering the wish of the Russian Academy of Sciences to have a closer cooperation with JINR in the fields of radiation biology and radiation medicine, as expressed in the letter announced by Professor M. Ostrovsky, the Scientific Council invites a corresponding report to be presented at the next session.

The Scientific Council recommends investigating the possibilities for studies in the field of radiation medicine at the existing facilities of JINR and those under construction, including development of apparatus for radiation surgery based on the use of hadron and gamma beams.

The Scientific Council takes note of the intention to reorganize DRRR into LRB and encourages the JINR Directorate to present a documented plan concerning the new laboratory.

**VII. Round Table "JINR's cooperation with German research centres, universities, organizations and foundations in the field of science and education"**

The Scientific Council thanks the representatives of JINR and of German research institutions — A. Sissakian, W. Scheid, S. Ivanova, D. Sdvizkov, B. Heinze, and A. Filippov — for the high quality of their presentations.

At present, JINR physicists are carrying out a wide range of research activities in the fields of basic physics research and education with scientists from 71 German institutions and universities located in 45 cities. This extensive cooperation is conducted (i) through direct exchanges between collaborating JINR and German groups, (ii) within the framework of the Agreement between JINR and the German Federal Ministry of Education and Research (BMBF) signed in 1991 and extended four times since, and (iii) with support of several German scientific foundations including the Helmholtz Association of National Research Centres (HGDF) and the German Academic Exchange Service (DAAD).

The Scientific Council highly appreciates this collaboration, looks forward to its continuation, and would welcome its intensification.

The Scientific Council invites further presentations concerning scientific and technical collaboration with research centres of the Member States and of other countries to be included in the agenda of future sessions.

Taking into account the progress in constructing the Cyclotron Centre of the Slovak Republic, in which JINR and its Flerov Laboratory of Nuclear Reactions are the main supplier of technology, the Scientific Council welcomes a Round Table concerning this activity at a future session.

**VIII. General points**

The Scientific Council has discussed among others the following topics:

PAC memberships. The Scientific Council asks the JINR Directorate to present information on the rotation of PAC members and on the terms of duties of the current members of the PACs.

Scientific Council procedure. In view of the regulation of the Committee of Plenipotentiaries concerning the Chairman of the Scientific Council, the Scientific Council recommends the appointment of an executive chairman from a Member State to co-chair the Council.

Young staff at JINR. The Scientific Council would like to hear a progress report on this issue at the next session.

Recommendation to the PACs. The Scientific Council asks the PAC for Nuclear Physics to hear a report on the FASA experiment at a future meeting. It also invites the PACs, in particular those for Nuclear and Condensed Matter Physics, to discuss priorities for the various areas of research for incorporation in the JINR road map.

Innovation activity and non-budgetary funding of projects. The Scientific Council asks the Directorate to present in its report at the next session (i) which specific innovation activity JINR will pursue, and (ii) what is the impact on the JINR services and resources of the activities supported by non-budgetary funds, in particular the extent to which they cover the related salary, infrastructure and overhead costs.

**IX. Awards**

The Scientific Council endorses the JINR Directorate's proposals to award the title "Honorary Doctor of JINR" to Professors V. Hajko, T. Kirk, and A. Rumyantsev in recognition of their outstanding contributions to the advancement of science and the education of young scientists, and congratulates them.

The Scientific Council congratulates Professor M. Itkis on receiving the 2005 Humbolt Research Award.

The Scientific Council congratulates Professor A. Sissakian on being awarded the Russian Order of Honour, which was presented to him at this session by the Head of the Russian Federal Agency for Science and Innovation, S. Mazurenko.

**X. Scientific reports**

The Scientific Council notes with interest the scientific reports presented at this session and dedicated to the World Year of Physics event:

“Synthesis of Superheavy Elements at JINR: New Results and Prospects”,

“Present Status of the Problem of Neutrino Mass and Oscillations”.

The Council thanks the speakers Professors Yu. Oganessian and S. Bilenky for their informative and high-quality presentations.

**XI. Announcement of vacant positions**

According to the JINR Regulations, the Scientific Council announces vacancies of the Director of the Bogoliubov Laboratory of Theoretical Physics and of the Director of the Frank Laboratory of Neutron Physics. The election for these positions will be held at the 100th session of the Scientific Council in June 2006.

**XII. Next session of the Scientific Council**

The 99th session of the Scientific Council will be held on 19–20 January 2006.

V. Kadyshevsky
Chairman of the Scientific Council