

I. General considerations

1. The Scientific Council takes note of the comprehensive report presented by JINR Director V. Kadyshevsky on the implementation of the recommendations taken at the 91st and 92nd sessions of the Scientific Council.

The Scientific Council is pleased to note that its recommendations to the JINR Directorate concerning the Scientific Programme of JINR, the operation and upgrade of the basic facilities, and the construction of new facilities are being successfully implemented.

2. The Scientific Council notes with interest the “Brief Review of the Scientific Results Obtained at JINR in 2002” prepared for this session in response to its previous recommendation. This material, based on publications in books, refereed journals, international conference proceedings, and on PhD thesis presentations, should be regularly presented at future sessions. The Scientific Council appreciates this work, which provides an essential tool for evaluation.

3. The Scientific Council congratulates Professors I. Meshkov, A. Skrinsky and their colleagues on the State Prize of the Russian Federation for their contributions to work on the “Method of electron cooling of heavy charged particle beams”.

4. The Scientific Council thanks Professor I. Meshkov for his highly successful work as Chief Engineer of JINR over the last five years and appreciates his outstanding contribution to the operation and development of JINR basic facilities and to the scientific research in the field of accelerator physics and engineering.

The Scientific Council notes that on 1 January 2003 Dr G. Shirkov was appointed as Chief Engineer of JINR for a term of one year.

5. At its next meeting in March 2003, the JINR Committee of Plenipotentiaries is to appoint the new membership of the Scientific Council. Completing the five-year term of duties, the members of the Scientific Council wish to express their appreciation of the constructive atmosphere at the Council meetings.

The Scientific Council wishes the present JINR Directorate further successful leadership of this international centre.

II. Considerations concerning the JINR Scientific Programme

1. The Scientific Council takes note of the reports presented by the Director of JINR and the Chairpersons of the PACs and endorses “The JINR Topical Plan for Research and International Cooperation in 2003”.

2. Taking into account the proposals of the JINR Directorate and the recommendations of the PACs, the Scientific Council endorses the following priority activities in 2003 on which financial and manpower resources should be focused:

in-house facilities

– improvement of the Nuclotron beam extraction system and of external beam lines, further efficiency of the complex, achievement of a wider range of accelerated particles and nuclei for the users, operation and development of the Nuclotron, and outphasing of the Synchrotron;

– modernization of the IBR-2 reactor according to the schedule of activities approved by the Agreement between JINR and the Russian Ministry for Atomic Energy: construction of the new movable reflector, replacement of the reactor core, manufacturing of the reactor's new fuel loading, and replacement of the cryogenic facility;

– start of physics experiments with radioactive ion beams, completion of Phase I of the Dubna Radioactive Ion Beams (DRIBs) project, implementation of work on the realization of Phase II of the project;

facilities under construction

– decommissioning of the IBR-30 reactor and construction of the IREN facility according to the revised schedule of November 2002 and dedicated funding with a view to completion of its first stage in 2005;

– further development of JINR's telecommunication links, networking, computing and information infrastructure;

ongoing research programmes and projects. The Scientific Council recommends that the allocation of resources should take into account the scientific impact and visibility of Dubna physicists in international collaborations.

– studies in modern mathematical physics; theoretical studies in particle physics, nuclear physics, and condensed matter physics, also with a view to supporting experimental work in these fields;

– continued participation in frontier experiments aimed at studying the fundamental properties of elementary particles and their interactions, amongst others at accelerator facilities at IHEP (Protvino), CERN, DESY, BNL and FNAL;

– study of rare weak processes (projects PIBETA, ANCOR, NEMO-3, FAMILON, E391a, etc) aimed at verification of the Standard Model of Particle Physics and search for new physics phenomena beyond the Standard Model, measurement of direct *CP*-violation, as well as investigations of neutrino properties and nature;

– experiments on the synthesis of superheavy nuclei with $Z=116$ and 118 using the

upgraded Gas-Filled Recoil and VASSILISSA separators, experiments on the chemical isolation and identification of superheavy elements with $Z=112$ and 114 , study of the fusion-fission reactions with ^{48}Ca , ^{58}Fe , ^{64}Ni ions using the CORSET+DEMON facility, study of the structure of light exotic nuclei and of the mechanism of nuclear reactions with radioactive and stable ion beams using the ACCULINNA, COMBAS, MSP-144 and ISTRAS set-ups, construction of the MASHA separator;

– continuation of relativistic nuclear interaction studies focused on the search for manifestations of quark and gluon degrees of freedom in nuclei and on properties of nuclear matter at high energies (e.g. experiment FASA), as well as studies of the spin structure of the lightest nuclei; in-house experiments mainly at the Nuclotron, as well as experiments at accelerators of other centres: CERN (SPS, PS), BNL (RHIC), GSI (SIS), Uppsala University (CELSIUS), RIKEN, and DESY (HERA);

– development of instrumentation and data acquisition equipment for spectrometers at the IBR-2 reactor to make possible a cold neutron programme, improvement of detectors for research with IREN;

other items that deserve attention

– development of the JINR Educational Programme, including special-purpose training of specialists for the Member States; in particular, start of the new project “Dubna International Advanced School of Theoretical Physics”;

– further R&D of accelerator subsystems for the LHC and linear colliders TESLA and CLIC as well as development of promising accelerator technologies;

– investigation of stochastic and deterministic effects induced in biological objects by ionizing radiation with different linear energy transfers, continuation of the development of new radiopharmaceuticals for cancer diagnostics and treatment.

The Scientific Council considers that:

– the large number of activities that feature in the 7-year Programme should be clearly prioritized;

– the future JINR facilities should be identified together with corresponding resources.

The 7-year Programme offers the JINR Directorate a good opportunity to express its vision of the main scientific goals for the 2003–2009 period. The Scientific Council recommends that the JINR Directorate take into account these considerations and present its decision at the 94th session.

III. Recommendations concerning JINR's long-term scientific programme

The Scientific Council takes note of the comprehensive draft of the "Programme of the Scientific Research and Development of JINR for 2003–2009" presented by Vice-Director A. Sissakian. The Scientific Council appreciates the efforts of the JINR Directorate to develop a competitive long-term scientific programme of JINR.

The Scientific Council endorses the general lines of the proposed Draft Programme and asks the JINR Directorate to prepare for the next session the final text of the Programme, taking into account the comments and input of the Scientific Council and the PACs.

The Draft Programme reflects the participation of JINR scientists in major international projects and the commitment of the Institute to provide world-class user facilities for basic research, namely DRIBs, IBR-2, IREN, and the Nuclotron. The Scientific Council recommends that the Committee of Plenipotentiaries consider this Draft Programme as a basis for initiating financial planning for JINR in 2003–2009 and that financial support as outlined in this document be requested from the Member States.

The Scientific Council takes note of the information presented by K. Kadyrzhanov, Plenipotentiary of Kazakhstan to JINR, about a plan to construct the DC-60 cyclotron in Astana (Kazakhstan) and to develop a dedicated research programme together with the Flerov Laboratory of Nuclear Reactions. The Scientific Council favourably considers this joint scientific and technical activity.

The Scientific Council takes note of the information presented by L. Masperi, Director of CLAF, concerning Schools of Physics and Biology and scientific plans at the MT-25 microtron in Havana (Cuba), to which JINR can contribute with lecturers and personnel training. The Scientific Council welcomes the inclusion of these activities in the 7-year scientific programme.

IV. Recommendations in connection with the PACs

The Scientific Council takes note of and concurs with the recommendations made by the PACs at their November 2002 meetings and presented by their Chairpersons.

Particle Physics Issues

The Scientific Council endorses the general lines of the particle physics programme outlined in the draft long-range plan. It also agrees with the PAC for Particle Physics, however, that the final 7-year plan document should be strengthened significantly along the lines indicated in the report of the PAC and in further comments provided by the PAC to the

JINR Directorate. In particular, the plan for developing a sound vision for the future of the Nuclotron programme should be clearly indicated in the final 7-year plan.

Nuclear Physics Issues

The Scientific Council endorses the general lines of the Draft Programme of Scientific Research in Nuclear Physics for 2003–2009.

In heavy-ion physics, these include modernization of the basic facilities, completion of the experimental set-ups and proposed infrastructure developments. Modernization of the U400 cyclotron and the preparation of experimental equipment are essential for the future programmes on superheavy elements and with radioactive-ion beams.

Highest priority in nuclear physics with neutrons is given to experiments on fundamental symmetries, on the electromagnetic properties of the neutron and on basic interactions with neutrons. The timely completion of the IREN project, including modernization of experimental equipment and electronics, are urgent issues for a successful realization of the local part of this programme.

The DLNP programme encompasses a wide range of physics objectives pursued both locally at the Phasotron and abroad at leading facilities on the world stage. Participation in projects on weak-interaction physics and properties of the neutrino are especially appreciated.

Condensed Matter Physics Issues

The Scientific Council concurs with the wish of the PAC for Condensed Matter Physics for continued progress of the refurbishment programme of the IBR-2 reactor and for further fulfilment of the agreement with the Russian Ministry for Atomic Energy.

The programme to optimize the Broad-Band complex at IBR-2 with respect to the spectrometers and vice versa should be started. This complex is an important part of the IBR-2 refurbishment programme.

The recommendations of the PAC concerning modifications of the text of the 7-year plan of JINR, mainly contained in the minutes of the PAC meeting, should be incorporated in the final version of this plan.

Common Issues

The Scientific Council recommends approval of the Programme of Research at BLTP for 2003–2009 and stresses the strong need for continuous theoretical support of the JINR experimental groups, with special emphasis on experiments at JINR.

The LIT Programme for 2003–2009 is well prepared and the Scientific Council recommends approval of its general lines. In the near future, special attention should be paid to the development of 1 Gb/s internal and external networks. A further important task

is network security.

The Scientific Council expresses its continuing appreciation of the activities of the JINR Educational Programme in promoting science amongst young people and in fostering links between JINR Member States.

V. Memberships of the PACs

Upon proposal by the JINR Directorate, the Scientific Council appoints F. Macáček (Comenius University, Bratislava, Slovakia) as a new member of the PAC for Condensed Matter Physics.

The Scientific Council thanks Professor V. Korsunsky for his most successful work as a member of the PAC for Condensed Matter Physics.

VI. Nominations

1. The Scientific Council elected by ballot:

V. Ivanov as Director of the Laboratory of Information Technologies for a term of five years, Yu. Potrebennikov as Deputy Director of the Laboratory of Particle Physics until the completion of the term of office of the LPP Director.

2. The Scientific Council thanks Professors A. Filippov and I. Puzynin for their highly successful work as Director of the Bogoliubov Laboratory of Theoretical Physics and as Director of the Laboratory of Information Technologies, respectively.

3. According to the JINR Regulations, the Scientific Council announces the vacancies of Director of DLNP and of Deputy Directors of LIT.

The election for these positions will be held at the 94th session of the Scientific Council.

VII. JINR's prizes

1. The Scientific Council congratulates Professor S. Bilenky (JINR) on being awarded the 2002 B. Pontecorvo Prize, in recognition of his outstanding contribution to theoretical research in the field of neutrino oscillations.

2. The Scientific Council approves the Jury's recommendations on the JINR prizes for 2002 (Appendix).

VIII. Awarding of the title "Honorary Doctor of JINR"

The Scientific Council congratulates Professors V. Meshcheryakov, T. Muminov, V. Okolovich, and H. Rollnik on being awarded the title "Honorary Doctor of JINR", in

recognition of their outstanding contributions to the advancement of science and the education of young scientists.

IX. Scientific reports

The Scientific Council notes with interest the scientific reports presented at this session:

“Synchrotron radiation: prospects of application in science and technologies”,

“Development of the Hadron Therapy Complex at the Phasotron in the Dzhelepov Laboratory of Nuclear Problems”,

“The outlook for investigations of photochemical and photobiological processes of vision at JINR basic facilities”,

“Project of the Dubna International Advanced School of Theoretical Physics”.

The Council thanks the speakers M. Kovalchuk, G. Mitsin, M. Ostrovsky, and A. Filippov for their informative presentations.

X. Next session of the Scientific Council

The 94th session of the Scientific Council will be held on 5–6 June 2003.

V. Kadyshevsky
Chairman of the Scientific Council