

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 93rd and 94th sessions of the Scientific Council.

The Scientific Council is pleased to note that most of 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. It would appreciate more information on the financial constraints hindering their complete implementation.

The Scientific Council recognizes the significant scientific accomplishments of JINR scientists in 2003 in the fields of particle physics, nuclear physics, and condensed matter physics, and wishes them new achievements in the future.

II. Recommendations on the JINR basic facilities

The Scientific Council takes note of the report “Status, operation and development of the JINR basic facilities” presented by JINR Chief Engineer G. Shirkov.

The Scientific Council is pleased to note the steadily increasing running time of the JINR facilities over the last five years. This positive process for the JINR research programme, on the one hand, and the constant growth of the electricity price, on the other hand, lead to the considerable increase of power expenditure at the Institute, which is a difficult task to handle under the conditions of limited budget. The JINR Directorate and the technical services responsible for the operation of the basic facilities are strongly encouraged to study and find possible ways for substantial electricity economy and for improving the efficiency of power consumption.

The Scientific Council also notes that the reliable operation of the basic facilities requires additional and regular expenses for their technical support and development.

The Scientific Council regrets the continuing delay in the construction of the IREN facility and supports the proposed partnership with the Kurchatov Institute to complete it.

III. Considerations concerning the JINR Scientific Programme

1. The Scientific Council takes note of the reports presented by the Director of JINR and the representatives of the PACs and endorses “The JINR Topical Plan for Research and International Cooperation in 2004”.

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 2004 on which financial and manpower resources should be focused:

in-house facilities

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

– 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: final assembly and bench-tests of the new movable reflector MR-3, its assembly at a permanent site near IBR-2 and the start-up of the reactor with the MR-3 in 2004; delivery of the reactor's new fuel and organization at JINR of a working area for the assembly of fuel elements into fuel cassettes;

– reconstruction of the U400 accelerator, completion of Phase I of the Dubna Radioactive Ion Beams (DRIBs) project, implementation of work on the realization of Phase II of the project, start of physics experiments with radioactive ion beams;

facilities under construction

– decommissioning of the IBR-30 reactor and construction of the IREN facility according to the revised schedule of October 2003 and dedicated funding with a view to completion of its first stage in 2006;

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

ongoing research programmes and projects

– studies in modern mathematical physics; theoretical studies in particle physics, nuclear physics, and condensed matter physics, first of all 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, study of rare weak processes aimed at verification of the Standard Model of particle interactions and search for new physics phenomena beyond the Standard Model, precise measurement of direct *CP*-violation, studies of the nucleon structure as well as thorough investigations of neutrino properties and nature at high, low and intermediate energies, participation in high-energy physics experiments at accelerator facilities at IHEP (Protvino), CERN, DESY, BNL and FNAL;

– participation in construction of accelerator subsystems for the LHC as well as development of promising accelerator technologies;

– 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, 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), BNL (RHIC), GSI (SIS), Uppsala University (CELSIUS), RIKEN;

– 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;

– research, development and manufacturing of neutron detectors, sample environment systems and data acquisition systems for the IBR-2 spectrometer complex, development of the FLNP local area network;

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

– development of the JINR Educational Programme, including special-purpose training of specialists for the Member States; in particular, the new activity “Dubna International Advanced School of Theoretical Physics” and annual summer student practical courses in JINR's fields of research.

IV. Recommendations concerning the long-term scientific programme

As requested by the Scientific Council, the JINR Directorate published the final text of “The Programme of JINR's Scientific Research and Development for 2003–2009” in October 2003. The Scientific Council appreciates the significant amount of work done by the JINR Directorate to prepare this comprehensive document.

At the previous session, the Scientific Council welcomed the intention of the Directorate to develop further the Institute's perspective programme, in particular by working out three supplements (dedicated to the infrastructure, recruitment of young staff, and a booklet of projects and themes which will be prioritized).

The Scientific Council takes note of the summaries of two supplements — the “Programme of the Development of the JINR Engineering and Technical Infrastructure” and “Young Staff at JINR”, presented in written form at this session. The Scientific Council underlines the importance of these issues for the future of JINR and endorses the main ideas outlined in the summaries. It asks the JINR Directorate to complete work on these supplements and looks forwards to a report on their implementation at the session in January 2005.

The Scientific Council appreciates the booklet of JINR projects and themes prepared for this session and made available in advance in electronic version. It asks the PACs, in cooperation with JINR Laboratories, at their meetings in April 2004, to continue the prioritization of all of the Institute’s projects and themes in accordance with the standard procedure.

V. Recommendations in connection with the PACs

The Scientific Council takes note of and concurs with the recommendations made by the PACs at their November 2003 meetings and reported at this session by Professors P. Spillantini, N. Janeva, and W. Nawrocik.

Particle Physics Issues

The Scientific Council endorses the main lines of the JINR Programme of Particle and Relativistic Nuclear Physics Research proposed for the period 2004–2006.

The Scientific Council congratulates the Nuclotron staff for the successful acceleration of the ^{56}Fe beam. It notes the importance of timely realization of the important measurements approved for the Nuclotron and strongly advises that sufficient resources be provided for this programme to prevent serious delays in achieving its physics goals.

The Scientific Council welcomes the work of the committee to evaluate the scientific programme of the Nuclotron and concurs with the PAC that this activity should be continued with the addition of experimentalists and accelerator physicists.

The Scientific Council urges the PAC to consider how best to study exotic baryons with Nuclotron experiments in a timely manner.

The Scientific Council supports the recommendations of the PAC on the opening of the new theme “Dubna International Advanced School of Theoretical Physics” and of the new project OPERA, on the addendum to the NIS experiment for pentaquark studies, on the continuation of the current activities beyond 2003, and on the closure of two projects as outlined in the PAC report.

Nuclear Physics Issues

The Scientific Council congratulates the Flerov Laboratory of Nuclear Reactions on the recent success in the synthesis of the new elements with $Z=113$ and $Z=115$ in the $^{48}\text{Ca} + ^{243}\text{Am}$ reaction. The very successful programme on the synthesis and investigations of superheavy elements should be continued with first priority.

The Scientific Council expressed its grave concerns about the underfinancing of DRIBs and IREN, which it has long considered to be flagship projects for JINR. The Scientific Council believes that the future health and competitiveness of the Institute depend on the timely provision of home-based facilities whose funding appears to be under severe pressure at present.

To maintain the attractiveness of the FLNR basic set-ups in the future, it is necessary to realize the DRIBs project in its entirety without further delay and to start experiments at DRIBs Phase I during 2004. The upgrade and modernization of the U400 accelerator should be completed with particular urgency.

Gamma spectroscopy of the heaviest elements will give a deeper insight into the structure of these complex nuclei, and the proposed Dubna–IN2P3 collaboration on this topic is welcomed. Around one month's beam time will be devoted to the first phase of the project (recoil implantation) in 2004. Feasibility studies for the second phase (recoil decay tagging) using the full beam intensity of U400 should be undertaken as early as possible.

The Scientific Council notes that proposed experiments of the Mu-CATALYSIS project may yield important new results, which can be obtained only at Dubna using the existing facility and new target technology from the All-Russian Scientific Research Institute of Experimental Physics (Sarov).

Condensed Matter Physics Issues

The Scientific Council reiterates the high priority of the modernization of the IBR-2 reactor. The Russian Ministry for Atomic Energy (Minatom) continues its significant support of this activity in accordance with the Agreement with JINR signed in 2000. The Scientific Council is pleased to note that in 2003 the financial support of Minatom for the IBR-2 modernization was contributed timely and in full volume and that JINR also funded this activity in the volume of 114% (285 k\$) of the planned amount for 2003 that partially compensated the debt accumulated during 2000–2002.

The Scientific Council appreciates the successful commissioning of the MR-3 movable reflector, which is vital for the planned start-up of the IBR-2 reactor by July 2004.

The Scientific Council also appreciates the completion of the manufacture by the "Mayak" Plant of the fuel elements for the future modernized reactor IBR-2M.

Common Issues

The Scientific Council highly appreciates the success of the JINR educational programme, considers it to be fruitful and extremely useful for the Institute and Member States, and endorses PAC recommendations on the extension of this activity with first priority for another five years. It also supports the University Centre's initiative to organize regularly summer physics practical courses for students from Member States. The cooperation of the JINR Laboratories is necessary to implement this aim.

The Scientific Council is pleased to note that two new departments — of theoretical physics and of nuclear physics, headed by JINR leading scientists, have recently been opened at the “Dubna” University. This positive development will help to attract more young people to science, including to research work at JINR.

VI. General discussion

Many subjects that are reported in the previous sections were covered during the general discussion. In addition the following specific points were raised:

1. The Scientific Council welcomes the prospect of associate membership of India at JINR and the possibility of increased collaboration with South Africa.
2. Some members of the Scientific Council observed that the corresponding scientific bodies of many laboratories elsewhere are chaired by scientists who are independent of the laboratory.

VII. Memberships of the PACs

Upon proposal by the JINR Directorate, the Scientific Council appoints P. Mikula (NPI, Řež, Czech Republic) and G. Pepy (Saclay, France) as new members of the PAC for Condensed Matter.

VIII. Nominations

1. The Scientific Council elected by ballot A. Kovalik and E. Syresin as Deputy Directors of the Dzhelepov Laboratory of Nuclear Physics until the completion of the term of office of the DLNP Director.
2. According to the JINR Regulations, the Scientific Council announces one vacancy of a DLNP Deputy Director. The election for this position will be held at the 96th session of the Scientific Council.

IX. JINR's prizes

1. The Scientific Council approves the Jury's recommendations on the JINR prizes for 2003 (Appendix).

2. The Scientific Council congratulates Professor Y. Totsuka (KEK, Tsukuba, Japan) on being awarded the 2003 B. Pontecorvo Prize, in recognition of his outstanding contribution to the discovery of muon neutrino oscillations.

X. Awarding of the title “Honorary Doctor of JINR”

The Scientific Council congratulates Professors R. Cashmore, W. Scheid, A. Sinaev, and B. Yuldashev 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.

XI. Scientific reports

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

“Project and research programme of the cyclotron complex for the L. Gumilev University (Astana)”,

“Prospects for the synthesis of superheavy elements at JINR”,

“Electron string phenomenon: physics and applications”.

The Council thanks the speakers Professors A. Sissakian, B. Gikal, Yu. Oganessian, and E. Donets for their informative presentations.

XII. In Memory of Luis Masperi

The Scientific Council deeply regrets the sad loss of Professor L. Masperi, Director of the Latin-American Centre of Physics (CLAF, Rio de Janeiro, Brazil) and member of the JINR Scientific Council, who has made an outstanding contribution to the establishment and development of the scientific relations between JINR and CLAF.

XIII. Next session of the Scientific Council

The 96th session of the Scientific Council will be held on 3–4 June 2004.

V. Kadyshevsky
Chairman of the Scientific Council