

JOINT INSTITUTE FOR NUCLEAR RESEARCH



The JINR Scientific Council's 92nd session

On the preparation of the Programme of JINR's Scientific Research and Development for the next 7 years period of 2003-2009

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CONTENTS of the REPORT:

- I. INTRODUCTION. AIMS AND TASKS
- II. COMMENTS on the SCIENTIFIC DIRECTIONS
- III. REFORMS and RESOURCES
- IV. CONCLUSION

ФИНАНСОВЫЕ НОРМЫ
(FINANCIAL REGULATIONS)

СТАТЬЯ I. ФИНАНСОВЫЙ ГОД.

СТАТЬЯ II. ФИНАНСОВЫЙ КОМИТЕТ.

СТАТЬЯ III. БЮДЖЕТ.

ПОДГОТОВКА БЮДЖЕТА.

ФОРМА БЮДЖЕТА.

УТВЕРЖДЕНИЕ БЮДЖЕТА.

СТАТЬЯ IV. РАСХОДЫ БЮДЖЕТА.

СТАТЬЯ V. ФИНАНСИРОВАНИЕ.

ВЗНОСЫ.

ДРУГИЕ ДОХОДЫ.

СТАТЬЯ VI. БУХГАЛТЕРСКИЙ УЧЕТ И ОТЧЕТНОСТЬ.

СТАТЬЯ VII. ХРАНЕНИЕ И ИНВЕСТИРОВАНИЕ СРЕДСТВ.

СТАТЬЯ VIII. ВНУТРЕННИЙ КОНТРОЛЬ (УПРАВЛЕНИЕ).

КОНТРАКТЫ И ЗАКУПКИ.

СПИСАНИЕ ПОТЕРЬ.

СТАТЬЯ IX. АУДИТ.

НАЗНАЧЕНИЕ АУДИТОРА.

АУДИТОРСКОЕ ЗАКЛЮЧЕНИЕ.

СТАТЬЯ X. ОБЩИЕ УСЛОВИЯ.

ВСТУПЛЕНИЕ В СИЛУ И ПОПРАВКИ.

Перечень Приложений к Финансовым нормам:

Приложение I. Финансовый комитет.

Приложение II. Бюджет.

Приложение III. Взносы.



THE LEADING IDEAS of the RESEARCH PLAN ARE:

- **JINR REMAINS A WORLD CLASS RESEARCH CENTRE**

- **JINR IS TO PROGRESS AS A MULTYDISCIPLINARY SCIENTIFIC ORGANIZATION WHICH INCLUDES:**
 - **THE FUNDAMENTAL RESEARCH IN THE MODERN HIGH ENERGY, NUCLEAR and CONDENSED MATTER PHYSICS**
 - **HIGH TECHNOLOGIES DEVELOPMENT and APPLICATIONS**
 - **UNIVERSITY and the SUPER-UNIVERSITY EDUCATION in the RELEVANT FIELDS**

- **LONG-TERM RESEARCH PLAN FORESEES:**
 - **TO CONSERVE THE MAIN SCIENTIFIC DIRECTIONS (to develop “home” facilities+infrastructure)**
 - **TO DEVELOP THE LARGE SCALE INTERNATIONAL COOPERATION WITH THE WORLD LEADING RESEARCH CENTRES**

TO REACH THESE GOALS THE JINR RESORCES WILL BE ALLOCATED AND CONCENTRATED TO THOSE RESEACH DIRECTIONS WHICH MOVE JINR FORWARD MAKING IT AS A LEADER IN THE MODERN SCIENTIFIC WORLD

Structure of the Programme

1. Introduction. Aims and tasks

2. Scientific trends. International cooperation

- Theoretical physics
- Elementary particle physics
- Relativistic nuclear physics
- Heavy-ion physics
- Low- and intermediate-energy physics
- Nuclear physics with neutrons
- Condensed matter physics
- Radiation and radiobiological research
- Networking, computing, computational physics
- Educational programme
 - in terms of
 - basic facilities: status and development
 - scientific research: projects and prospects
 - laboratories infrastructure
 - personnel: status and dynamic of changes
 - financial evaluations

3. Reforms

- Infrastructure
- organizational structure
- basic regulation documents
- personnel
- social policy
- investments
- R&D and technology transfer

4. Resources. Finance tables

5. Conclusions: final statements and budget prospects



***Bogoliubov Laboratory of
Theoretical Physics***

in 2003 – 2009

• FIELDS AND PARTICLES:

Particle theory → *support of the JINR
experimental programs*

Quantum field theory

Modern mathematical physics

**• THEORY OF NUCLEI AND
OTHER FINITE SYSTEMS**

**• THEORY OF CONDENSED
MATTER**

*support
of the JINR
experimental
programs*

Very important fields of research will be related to
astroparticle physics and cosmology

Nuclotron: research program, technical task and applied sciences

Research program

- Search for the quark and gluon degrees of freedom in nuclei (SPHERE, DISK, MARUSYA)
- Spin physics studies (DELTA-SIGMA, DELTA, SINGLET, SCAN-2, LNS, SPIN)

Technical tasks

- Negative ion injection
- Development of ion sources
- Linac Upgrade
- Nuclotron booster ring construction
- Superconducting beam transfer lines

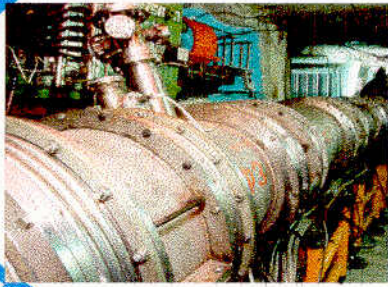
Applied Sciences

- Radiobiology and space medicine
- Nuclear beam influence on microelectronic components
- Transmutation of a radioactive waste products
- Aspects of the electronuclear method of energy production
- Medical applications of nuclear beam

POSSIBLE PERSPECTIVES:

- NEW COLLIDER: $E_{CM} = 2 \times 6 \text{ GeV/n}$
- (NUCLOTRON) + (STORAGE RINGS) → COLLIDER

NUCLOTRON – Users' Facility



Australia
University of Sidney

Belarus
Institute of Radiative Physical-Chemical Problems,
Academy Scientific and Engineering Complex
"SOSNY" (Minsk)

Bulgaria
Institute for Nuclear Research
and Nuclear Energy,
University of Chemical
Technology and Metallurgy
(Sofia)

Czech Republic
Nuclear Physics Institute (Řež), Charles University,
Czech Technical University (Prague)

Greece
Aristotle University
(Thessaloniki)

Italy
Istituto Nazionale di Fisica Nucleare
(Florence)

Germany
Technische Hochschule Darmstadt – Institut für
Kernphysik (Darmstadt), Universität (Siegen,
Karlsruhe), Philipps-Universität Marburg (Marburg),
Forschungszentrum (Jülich)

Mongolia
Institute of Physics and Technology,
National University of Mongolia
(Ulaanbaatar)

JINR
LHE, DLNP,
LPP, LIT,
BLTP, FLNP,
DRRR

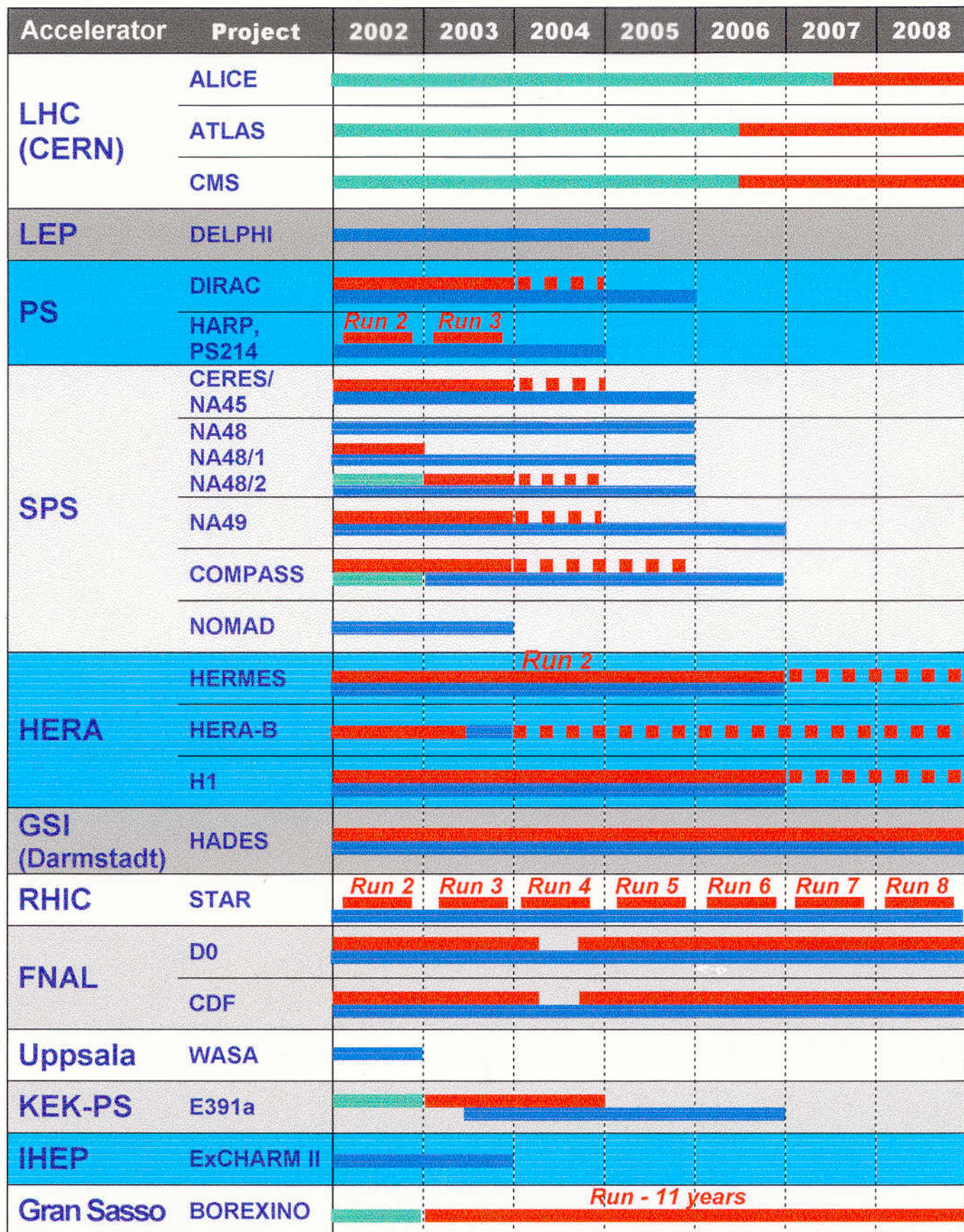
Slovak Republic
Institute of Experimental Physics, University (Košice),
Institute of Physics, Comenius University (Bratislava)

Poland
Institute of Nuclear Physics (Cracow),
Institute for Nuclear Studies (Warsaw)

Russia
Institute for Nuclear Research (Troitsk), Physical Institute (FIAN),
Research Institute of Nuclear Physics of MSU,
All-Russian Scientific Research Institute of Experimental Physics (Sarov),
Institute of Atomic Energy (Obninsk)

Other Scientific Centers

Time Schedule of External Projects (2002 – 2008)



DRIBs - Dubna Radioactive Ion BeamS



U400 Accelerator



Vertical Section



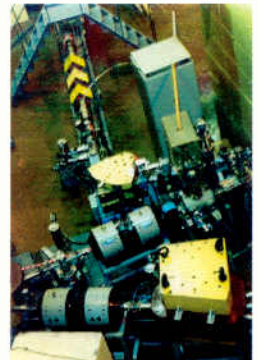
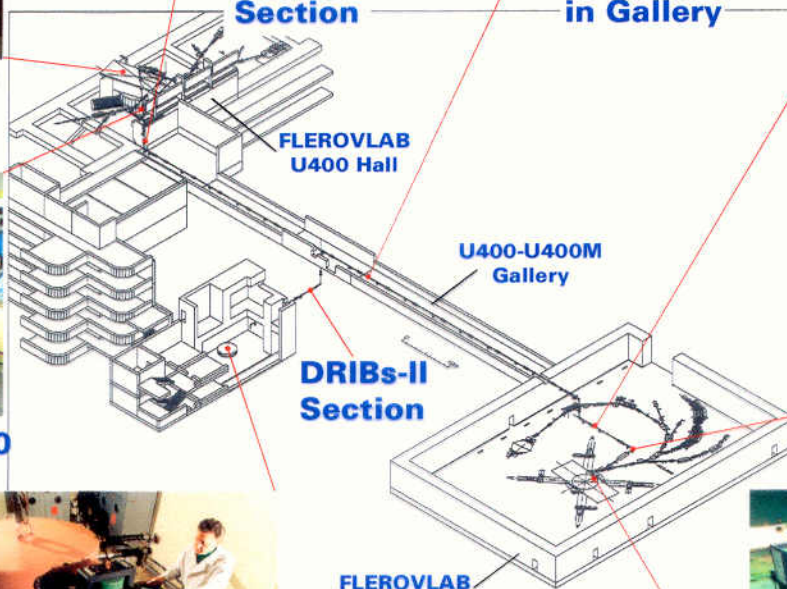
DRIBs-I Units in Gallery



DRIBs-I in U400M Hall



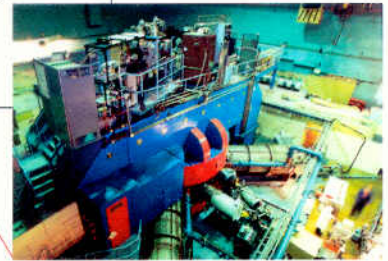
DRIBs-I above U400



DRIBs-I Start Section

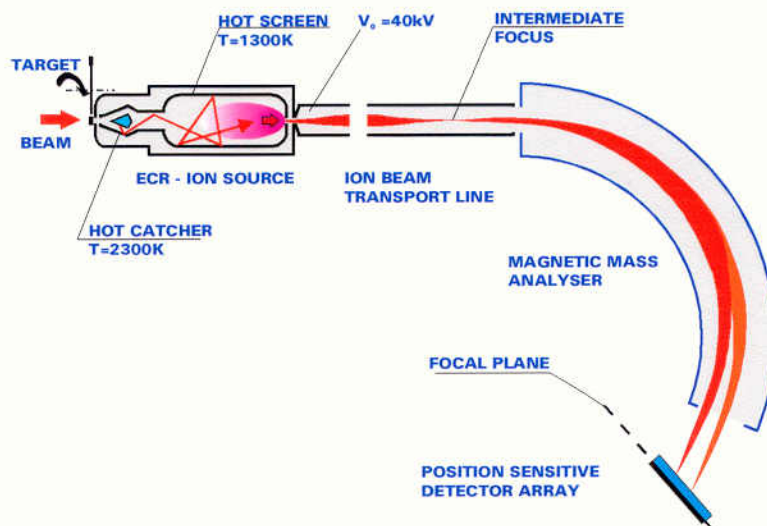


Microtron MT-25



U400M Accelerator

MASHA - Mass Analyzer of Super Heavy Atoms



TOPIC A

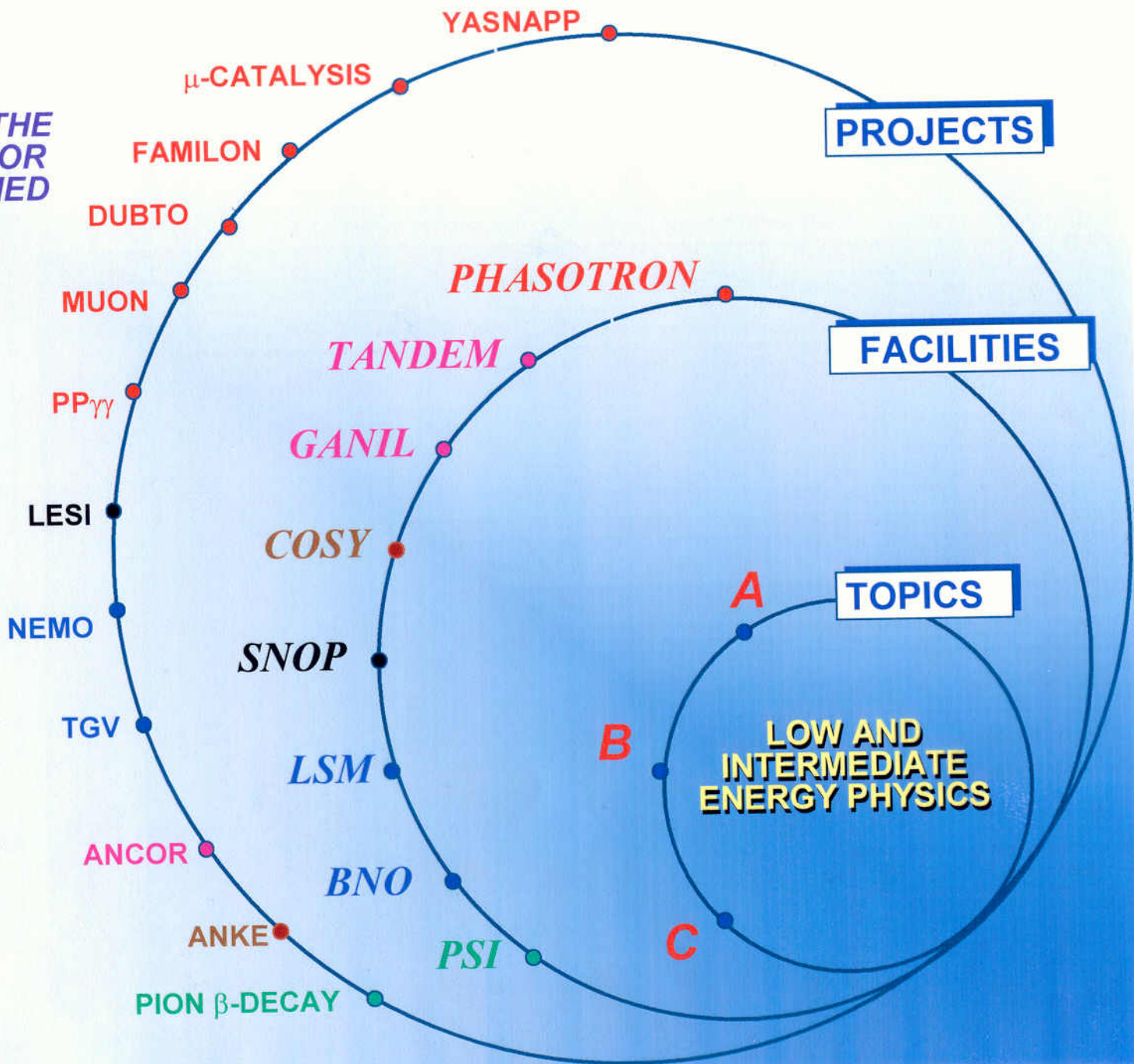
IMPROVEMENT AND DEVELOPMENT OF THE LNP PHASOTRON FOR PHYSICS AND APPLIED INVESTIGATIONS

TOPIC B

NUCLEUS AND PARTICLE INTERACTION AT INTERMEDIATE ENERGIES

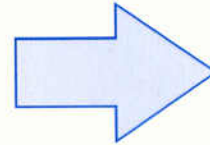
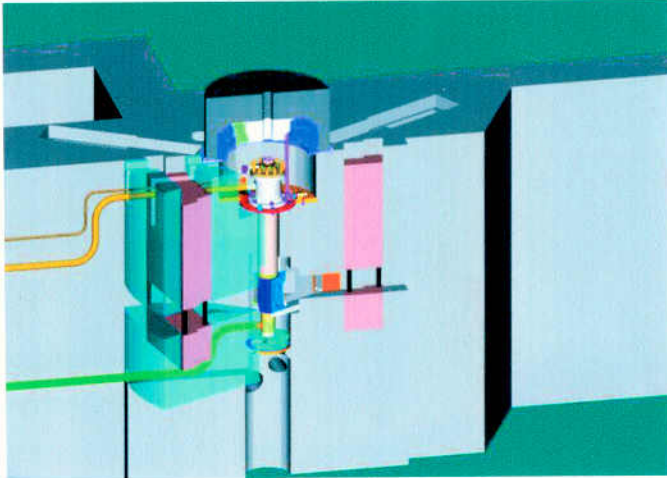
TOPIC C

INVESTIGATION OF FUNDAMENTAL INTERACTIONS IN NUCLEI AT LOW ENERGIES



Nuclear Physics with Neutrons

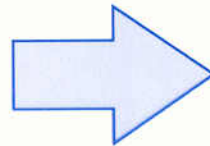
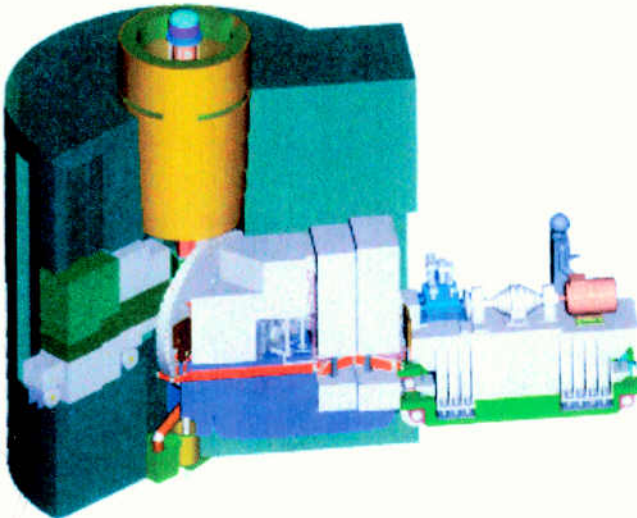
IREN



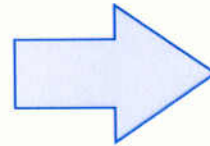
Fundamental symmetries investigation

KaTRIn, POLYANA, UGRA, DELRANE

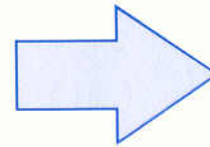
IBR-2



Biomonitoring



Biotechnologies



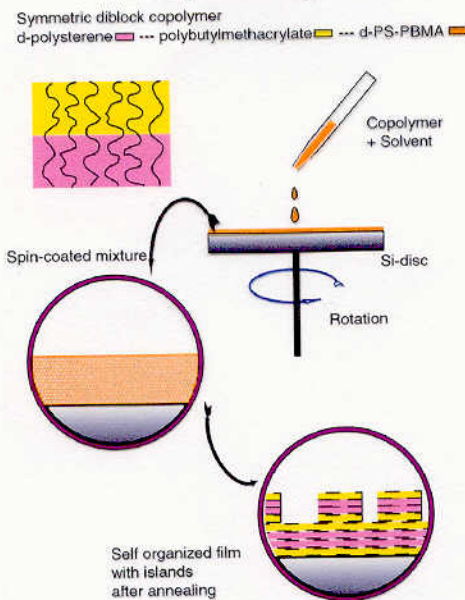
Nuclear data for transmutation and astrophysics

Condensed Matter Research at IBR-2



Biology, cell
membranes structure
and functions

Spincoating

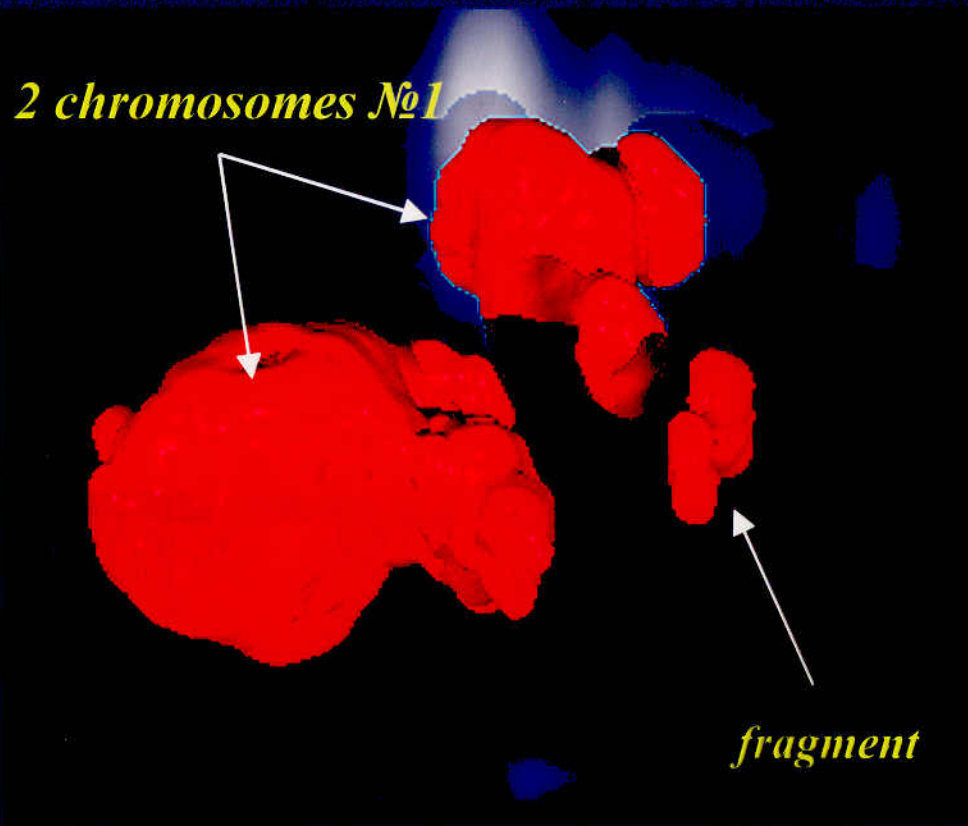


Nanostructures and
polymers



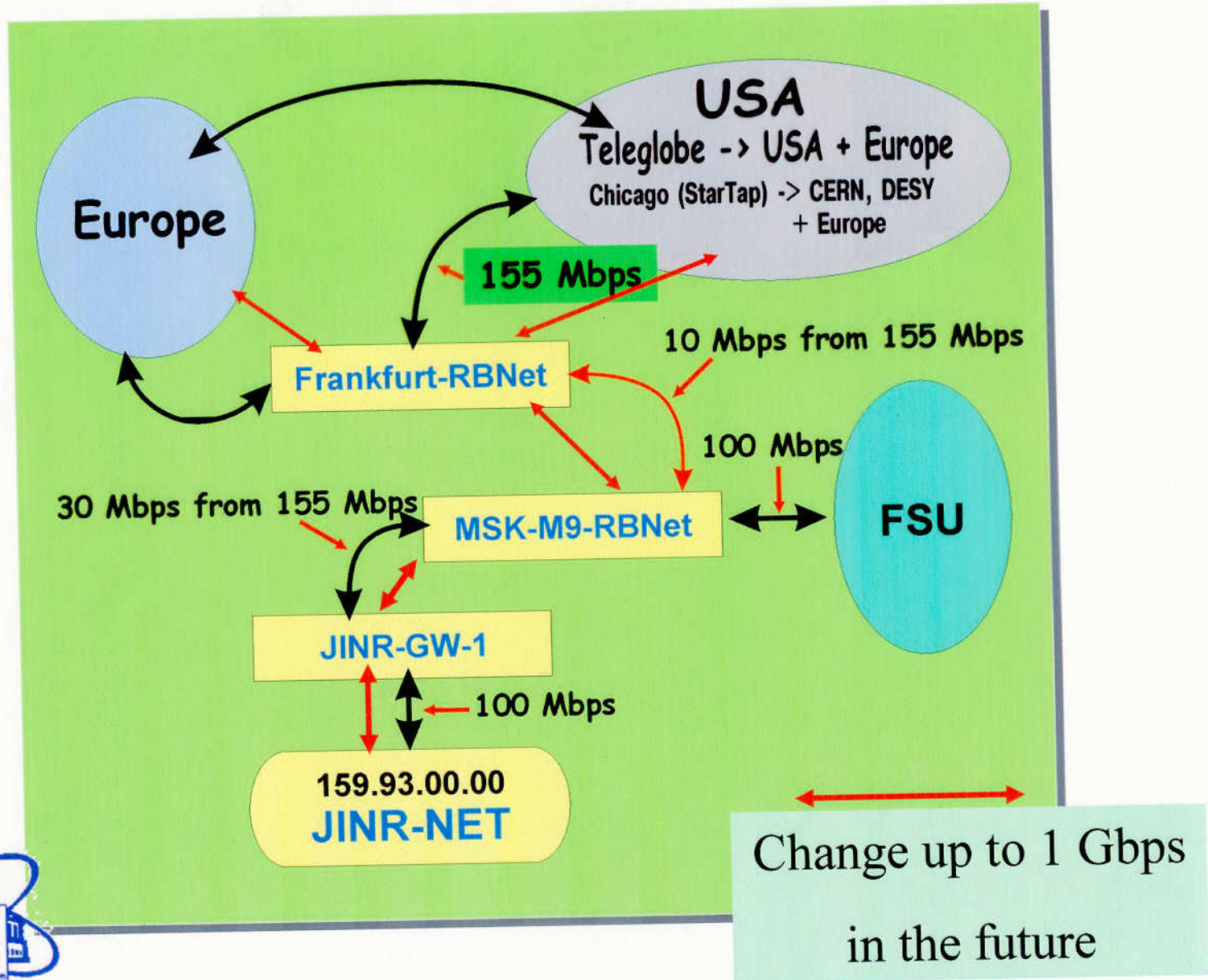
Material science,
engineering and earth
sciences

Radiation cytogenetics



Chromosome 1 of human lymphocyte nucleus in interphase with fragment after irradiation 1 GeV protons at synchrotron. The 3 D dimension picture was obtained by using FISH technique and confocal microscopy.

B.



- Preparatory courses for secondary school students
- Practicum in physics for secondary school teachers and students
- Revival of the School of Physics and Mathematics

- 4th, 5th and 6th-year students of MEPI, MIPT, MSU, and other higher education institutions
- Specialized training programmes for the Czech Republic, Poland, Slovakia, and other countries
- Extension of the list of specialties and departments
- New engineering specialties

Master's degree programmes

Development of the cooperation with international organizations (CERN, DAAD, EPS, EUPEN, IAPS and UNESCO)

Enlightenment activity
JINR-trips

Training in new specialties and qualifications improvement
Training technical and working staff



Postgraduate studies
Bilateral supervision:
JINR and a Member State

Optional lectures, conferences, and schools for students and postgraduates from the JINR Member States

REFORMS



1. Social policy

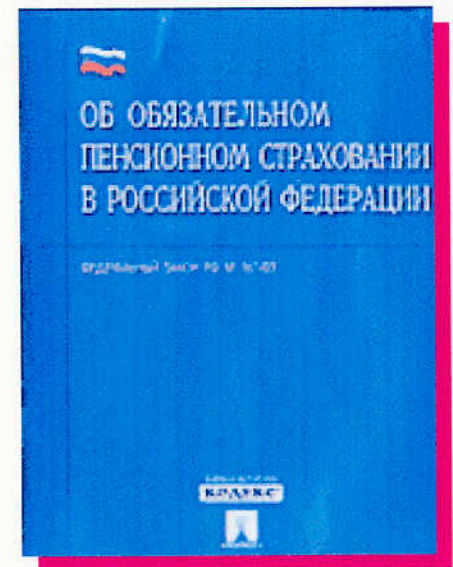
- Substantial *increase of the level of salaries* of the Institute's staff.
- *Recruitment of young employees - housing.*
- *Corporate pension system .*

2. Infrastructure

- *Maintenance and improvement* of the industrial and social infrastructure.
- *Optimization of the use* of buildings, installations and other facilities.
- *Attraction of investments* for the modernization of the Institute's infrastructure.

3. Financial and organizational reforms

- Effective system of *the calculation of the Member States' contributions* and of settlement of contribution *debts.*
- Improvement of the Institute's *basic regulation documents.*
- Use of *intellectual property and technology transfer.*



FINANCIAL RESOURCES

The income and expenditure estimates are based on the following principles:

- *the real and authentic picture of the Institute's financial situation*
- *the stable level of the Institute's budgetary incomes*
- *the concentration of financial resources*
- *optimization of the Institute's expenditure scheme*

