

*A world-renowned Russian physicist, science organizer and public figure, member of the Presidium of the Russian Academy of Sciences, Director of the Joint Institute for Nuclear Research, Academician **Victor Anatolievich Matveev** turned **75** on **11 December 2016**.*

We congratulate Victor Anatolievich on your jubilee and wish you many happy returns, health and happiness.

Programme Advisory Committee for Nuclear Physics

45-th meeting

25–26 January 2017

Fabrice Piquemal

23 June 2016

- | | |
|---|--------------|
| 1. Opening of the meeting | F. Piquemal |
| 2. Implementation of the recommendations of the previous PAC meeting | F. Piquemal |
| 3. Information on the Resolution of the 119th session of the JINR Scientific Council (February 2016) and on the decisions of the JINR Committee of Plenipotentiaries (April 2016) | M. Itkis |
| 4. Report on the theme "Investigations in the Field of Nuclear Physics with Neutrons" and proposal for opening a new theme
<i>Referees: G. Danilyan
O. Shcherbakov
V. Ostashko
Guinyun Kim</i> | V. Shvetsov |
| 5. Report on the theme "Physics of Light Mesons" and its projects and proposal for their extension:
<i>Referees: E. Strokovsky
V. Burov
A. Korshennikov
C. Petitjean</i> | A. Kulikov |
| 5.1. Report on the project "Study of the nucleon spin structure in strong and electromagnetic interactions" (GDH@SPASCHARM)
<i>Referees: V. Ladygin
V. Pavlov
C. Beck</i> | Yu. Plis |
| 6. Final results on the theme "Synthesis and Properties of Nuclei at the Stability Limits" and proposal for opening a new theme
<i>Referees: R. Jolos
A. Sobiczewski
E. Vardaci</i> | M. Itkis |
| 7. Report on the theme "Accelerator Complex of Ion Beams of Stable and Radioactive Nuclides" and proposal for opening a new theme
<i>Referees: I. Meshkov
S. Hofmann
M. Lewitowicz</i> | G. Gulbekyan |

- | | |
|---|----------------------------|
| 8. Report on the theme "Information and Computing Infrastructure of JINR" and proposal for its extension.
Proposal for a new project: "Multifunctional Information and Computing Complex (MICC)"
<i>Referees: A. Olshevskiy
A. Klimentov
I. Štekl
Z. Vilakazi</i> | T. Strizh |
| 9. Main directions of research in the field of nuclear physics for 2017–2023 | M. Itkis |
| 10. Proposals on methods for evaluation of JINR projects and themes by the Programme Advisory Committees | O. Belov |
| 11. Discussion of the Draft Seven-Year Plan for the Development of JINR for 2017–2023 in the field of nuclear physics research and general discussion | |
| 12. Visit to the Frank Laboratory of Neutron Physics | V. Shvetsov
N. Skobelev |
- 24 June 2016**
- | | |
|---|-------------|
| 13. Meeting of the PAC members with the JINR Directorate | |
| 14. Scientific reports: | |
| 14.1. "UCN source at external beam of thermal neutrons" | A. Muzychka |
| 14.2. "Population of ground-state rotational bands of heavy nuclei produced in complete fusion reactions" | V. Sargsyan |
| 15. Poster presentations by young scientists | |
| 16. General conclusion on the poster presentations | |
| <u>Closed session:</u> | |
| 17. Proposals for the agenda of the next PAC meeting | |
| 18. PAC recommendations | |
| 19. Closing of the meeting | |

The PAC notes the various achievements in the investigations of fundamental symmetries using cold polarized neutrons and fundamental properties of the neutron using ultracold neutrons, and the measurements of related nuclear data. The PAC also appreciates the interdisciplinary and multilateral cooperation between FLNP and other research laboratories in Russia and other countries.

Experiments at the IREN facility

- Activities on the preparation of the (n,e) scattering experiment;
- Investigation of the effect of neutron and gamma radiation on plastic scintillators used in the CMS experiment at CERN;
- Search for cosmic dust in the samples from mountain glaciers;
- Measurements with a prototype of uranium target;

Analytical investigations at the IBR-2 reactor

- Biomonitoring;
- Biotechnologies;
- Environmental assessment;
- Analysis of food products;
- Geology;
- Analysis of materials of extraterrestrial origin;
- Medicinal plants;
- Materials science;

PAC recommendation

The PAC recommends approval of the new theme “Investigations of Neutron Nuclear Interactions and Properties of the Neutron” until the end of 2019 for continuation of research activities in nuclear physics using FLNP neutron facilities, such as the high-intensity pulsed neutron sources at IREN, the IBR-2 pulsed reactor, and the EG-5 electrostatic generator. The FLNP Directorate should concentrate to achieve the designed beam parameters of the IREN project in order to pursue the proposed research programmes of FLNP during 2017–2019.

The Scientific Council notes the importance of the development of the IREN facility and experiments carried out with it. The Scientific Council appreciates the various achievements of FLNP scientists in the investigations of fundamental symmetries using cold polarized neutrons, research on fundamental properties of the neutron using ultracold neutrons, and measurements of related nuclear data.

The Scientific Council supports the opening of a new theme “Investigations of Neutron Nuclear Interactions and Properties of the Neutron” to continue research activities in nuclear physics using FLNP’s neutron facilities (IREN, IBR-2, EG-5). The FLNP Directorate should concentrate on achieving the designed beam parameters of the IREN project in order to pursue the proposed research programmes of this Laboratory during 2017–2019.

Recommendations on the theme “Physics of Light Mesons”

5. Report on the theme “Physics of Light Mesons” and its projects and proposal for their extension:

A. Kulikov

Referees: E. Stokovskiy

V. Burov

A. Korshennikov

C. Petitjean

The PAC heard a report on the theme “Physics of Light Mesons” presented by A. Kulikov. The theme includes 3 projects (COMET, GDH&SPASCHARM, SPRING) and 4 activities (MEG-PEN, TRITON, MUON, PAINUC).

The **COMET project** is under preparation at the J-PARC accelerator and is aimed at searching for muon-to-electron conversion, which is a lepton flavour violation process and manifests physics beyond the Standard Model. The participants from JINR have made important technical contributions by constructing the straw tube detector and testing the crystals for the calorimeter.

In the **SPRING project** much attention was given to experiments at the ANKE set-up at the COSY accelerator in Jülich. The fulfilled studies of the polarized proton and deuteron interactions with the jet polarized targets have produced numerous new data about the hadron interaction dynamics through the measurement of spin observables.

Recommendation. *Due to the termination of the COSY work for hadron physics, it is suggested that the status of SPRING be changed from “project” to “activity” within the above theme.*

The **TRITON experiment** is the latest of JINR's long-standing famous experiments in muon catalyzed fusion aimed at a conclusive study of the pμ fusion reaction. It has performed a successful run at the DLNP Phasotron, observing for the first time two additional output channels (e^+e^- and very likely two γ) which escaped observation in previous experiments.

Recommendation. *To conclude this experiment, a final run of about 200 h at the Phasotron should be allocated.*

In the **MEG-PEN and PAINUC** experiments (at the PSI and DLNP accelerators), PEN and PAINUC are in final analysis. MEG has published a **new** upper limit of the neutrinoless decay $\mu \rightarrow e\gamma$ with a branching ratio of less than $4.2 \cdot 10^{-13}$ and is continued with higher sensitivity as MEG-II.

Recommendation. *The PAC expects final reports on the results of PEN and PAINUC. JINR's collaboration in the MEG-II experiment should be continued.*

General recommendation. **The PAC recommends approval of the report on the theme. However, the extension of this theme should be postponed until its detailed evaluation at the next PAC meeting.**

At this session, we return to the theme "Physics of Light Mesons."

The JINR Directorate decided to refer the project COMET for looking at PAC for Particle Physics.

This time we have to make a final recommendation on the fate of further studies with light mesons at JINR.

Project GDH&SPASCHARM

The PAC heard a report on the **GDH&SPASCHARM project** and a proposal for its continuation presented by Yu. Plis.

The goal of the project is an investigation of the nucleon spin structure with **the MAMI microtron in Mainz (GDH)** and with the U-70 synchrotron **in Protvino (SPASCHARM)**. In both experimental programmes, polarized targets are used which were developed totally or partly at JINR.

Recommendation. The PAC appreciates the quality of preparations for the experiments as part of the GDH&SPASCHARM project and recommends its extension until the end of 2019.

Recommendations on the concluding theme “Synthesis and Properties of Nuclei at the Stability Limits” and on opening a new theme

6. Final results on the theme “Synthesis and Properties of Nuclei at the Stability Limits” and proposal for opening a new theme M. Itkis
Referees: R. Jolos
A. Sobiczewski
E. Vardaci

The PAC heard with satisfaction a report on the scientific results of the concluding theme “Synthesis and Properties of Nuclei at the Stability Limits” and a proposal on opening a new theme **“Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability”**, presented by M. Itkis.

The new theme includes the following major objectives:

1. Synthesis of new elements. Synthesis of new isotopes of superheavy elements and study of their properties.
2. α -, β -, and γ -spectroscopy of heavy and superheavy nuclei with SHELS.
3. Chemical properties of heavy nuclides.
4. Experiments with the magnetic analyser of superheavy atoms - MASHA.
5. Laser spectroscopy of isotopes.
6. Study of fusion-fission, quasi-fission and multi-nucleon transfer reactions.
7. Investigation of the structure of exotic nuclei close and beyond the nucleon stability limits with the ACCULINNA-1, ACCULINNA-2, and COMBAS set-ups.
8. Study of reactions induced by stable and radioactive ion beams leading to the formation of exotic nuclei.
9. Theoretical studies of nuclear structure and nuclear reactions.
10. Update and maintenance of the network knowledge base on nuclear physics.



I U P A C

International Union of Pure
and Applied Chemistry

May 2011:

Approval of the discovery of new elements *114* and *116*

May 2012:

Official approval of the name *Flerovium* for element *114*
and the name *Livermorium* for element *116*

30th December 2015:

Approval of the discovery of new elements *113*, *115*, *117*, and *118*

- Priority for elements *115* and *117* is assigned to: **JINR** (Dubna) - **LLNL** (USA) – **ORNL** (USA) collaboration
- Priority for element *118* is assigned to **JINR** (Dubna) – **LLNL** collaboration.

8th June 2016:

Provisional recommendations for naming elements *113*, *115*, *117*, *118*

(Нихоний) 113	Флеровий 114	(Московий) 115	Ливерморий 116	(Теннесси) 117	(Оганесон) 118
(Nh)	Fl	(Mc)	Lv	(Ts)	(Og)
(Nihonium)	Flerovium	(Moscovium)	Livermorium	(Tennessine)	(Oganesson)

The 7th period of the periodic table of elements is now complete

*All these elements were synthesized for the first time at the U400
accelerator complex of the Flerov Laboratory of Nuclear Reactions of JINR.*

On 30 November 2016, the International Union of Pure and Applied Chemistry announced that the elements 113, 115, 117, and 118 are now formally named.

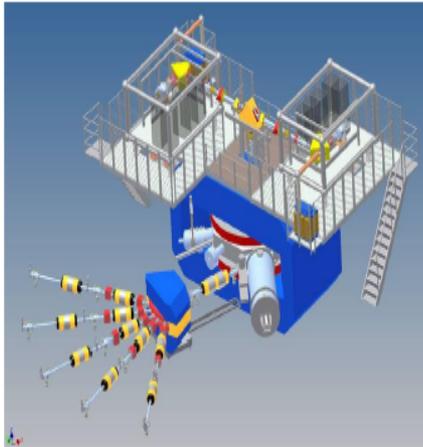
The name nihonium with the symbol Nh for element 113 was proposed by the discoverers at RIKEN Nishina Center for Accelerator-Based Science (Japan); the **name came from Nihon** which is one of the two ways to say “Japan” in Japanese, and literally mean “the Land of Rising Sun”.

Moscovium with the symbol Mc for element 115 and tennessine with the symbol Ts for element 117 were proposed by the discoverers at the Joint Institute for Nuclear Research, Dubna (Russia), Oak Ridge National Laboratory (USA), Vanderbilt University (USA) and Lawrence Livermore National Laboratory (USA). **Both are in line with tradition honoring a place or geographical region.** Moscovium is in recognition of the Moscow region and honors the ancient Russian land that is the home of the Joint Institute for Nuclear Research, where the discovery experiments were conducted using the Dubna Gas-Filled Recoil Separator in combination with the heavy ion accelerator capabilities of the Flerov Laboratory of Nuclear Reactions. Tennessine is in recognition of the contribution of the Tennessee region of the United States, including Oak Ridge National Laboratory, Vanderbilt University, and the University of Tennessee at Knoxville, to superheavy element research.

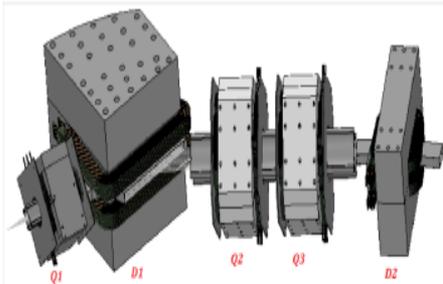
In line with the tradition of honoring a scientist, the name oganesson and symbol Og for element 118 was proposed by the collaborating teams of discoverers at the Joint Institute for Nuclear Research, Dubna (Russia) and Lawrence Livermore National Laboratory (USA) and recognizes Professor Yuri Oganessian for his pioneering contributions to transactinoid elements research. His many achievements include the discovery of superheavy elements and significant advances in the nuclear physics of superheavy nuclei including experimental evidence for the “island of stability”.

Factory of SHE

SHE factory. DC-280 cyclotron. New GFS



DC280 (expected) E=4-8 MeV/A		
Ion	Ion energy [MeV/A]	Output intensity
${}^7\text{Li}$	4	1×10^{14}
${}^{18}\text{O}$	8	1×10^{14}
${}^{40}\text{Ar}$	5	6×10^{13}
${}^{48}\text{Ca}$	5	$0,6-1,2 \times 10^{14}$
${}^{54}\text{Cr}$	5	2×10^{13}
${}^{58}\text{Fe}$	5	1×10^{13}
${}^{124}\text{Sn}$	5	2×10^{12}
${}^{136}\text{Xe}$	5	1×10^{14}
${}^{238}\text{U}$	7	5×10^{10}



Superheavy Element Factory – the Goals

- Experiments at the extremely low ($\sigma < 50$ fb) cross sections:
 - Synthesis of new SHE in reactions with ${}^{50}\text{Ti}$, ${}^{54}\text{Cr}$...;
 - Synthesis of new isotopes of SHE;
 - Study of decay properties of SHE;
 - Study of excitation functions.
- Experiments requiring high statistics:
 - Nuclear spectroscopy of SHE;
 - Laser spectroscopy of atomic levels;
 - Precise mass measurements;
 - Study of chemical properties of SHE.

PAC recommendation

The PAC is satisfied with the results produced and with the report on the concluding theme presented. The PAC recommends approval for opening a new theme “Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability” for a term of five years, until the end of 2021.

Recommendations on the concluding theme “DRIBs-III” and for a new theme

7. Report on the theme “Accelerator Complex of Ion Beams of Stable and Radioactive Nuclides” and proposal for opening a new theme

G. Gulbekyan

Referees: I. Meshkov
S. Hofmann
M. Lewitowicz

The PAC heard a report on the theme “Accelerator Complex of Ion Beams of Stable and Radioactive Nuclides (DRIBs-III)” and a proposal for opening a new theme presented by G. Gulbekian.

The PAC is pleased with the high-quality results related to the development and construction of a new high Current DC280 accelerator, the construction of the experimental building of the Factory of (SHE) and of new physics set-ups (DGFRS-II, SHELS, ACCULINNA-2)

FLNR accelerator complex in 2016.
4 heavy ion cyclotrons
and MT-25 microtron – electron accelerator

The diagram shows a central horizontal beam line connecting four main components: U400 on the left, DRIBs in the middle, MT25 below the center, and U200, IC100, and U400M on the right. Red arrows link these components to photographs: U400 to a photo of a large blue cylindrical structure; DRIBs to a photo of a complex particle detector; MT25 to a photo of a large circular microtron; U200 to a photo of a cyclotron; IC100 to a photo of a detector; and U400M to a photo of a large experimental setup.

- U-400M - E= 6-50 MeV/nucleon
- U-400 - E=3.5-20 MeV/nucleon
- U-200 - E=3-15 MeV/nucleon
- IC-100 - E≈1.2;0.5 MeV/nucleon
- MT-25 - electron accelerator E = 25 MeV
- DRIBs (U400M+U400) $^6\text{He}, ^8\text{He}$ E = 6 - 13 MeV/nucleon

The PAC endorses the opening of a new theme “**Development of the FLNR Accelerator Complex and Experimental Set-ups (DRIBs-III)**” for 2017–2021.

The theme comprises the following major tasks:

1. Completion of the construction and commissioning of the Factory of Superheavy Elements (SHE)
2. Upgrade of the U400M cyclotron
3. Construction of a new U400R accelerator experimental hall.
Preparation for the upgrade of the U400 cyclotron
4. Development and construction of new long-running experimental set-ups



PAC Recommendations

The PAC appreciates the report on the theme “**Accelerator Complex of Ion Beams of Stable and Radioactive Nuclides (DRIBs-III)**”.

It recommends approval for opening a new theme “**Development of the FLNR Accelerator Complex and Experimental Set-ups (DRIBs-III)**” for a term of five years, **until the end of 2021**.

The PAC recommends that the JINR Directorate draw particular attention to the timely completion of the construction of the SHE Factory, the installation and commissioning of the DC280 accelerator and physics set-ups (a gas-filled separator and a pre-separator for chemical studies) with a view to conducting first experiments at the SHE Factory.

The PAC strongly supports the proposed upgrade of the new 400M cyclotron and the full completion of the ACCULINNA-2 separator with associated instrumentation.

The PAC recommends the upgrade of the U400 cyclotron and reconstruction of its experimental hall.

The PAC encourages the FLNR Directorate to formulate written proposals for a number of projects which are part of the new theme and present them for consideration at future meetings of the PAC.

The realization of the theme along the proposed schedule can be achieved if there is sufficient allocation of financial and human resources by JINR.

The Scientific Council notes with satisfaction the results produced by FLNR in the synthesis of new elements and in the study of reactions with beams of stable and radioactive nuclides. The Scientific Council supports the opening of a new theme “Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability” for the next five years with the following major objectives: synthesis of new superheavy elements; α -, β -, and γ -spectroscopy of heavy and superheavy nuclei and study of their chemical properties; study of reactions induced by stable and radioactive ion beams leading to the formation of exotic nuclei; investigation of the structure of exotic nuclei close and beyond the nucleon stability.

The Scientific Council appreciates the high-quality results achieved by FLNR in improving its accelerator facilities and experimental research instruments, including the development and construction of a new high-current DC-280 accelerator, the construction of the experimental building of the SHE Factory and of new physics set-ups (DGFRS-II, SHELS, ACCULINNA-2).

The Scientific Council supports the opening of a new theme “Development of the FLNR Accelerator Complex and Experimental Set-ups (DRIBs-III)” for the next five years with the following major objectives: completion of construction and commissioning of the SHE Factory, upgrade of the U400M cyclotron, development and construction of new long-running experimental set-ups.

Today we heard the report of Sergey Dmitriev about the Status of the SHE Factory.

In accordance with the recommendations of the 44th meeting of the PAC for Nuclear Physics Direction of FLNR supports the opening of the projects under the themes «Development of the FLNR Accelerator Complex and Experimental Setups (DRIBS-III)» and «Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability». Construction of all new experimental setups complemented by an appropriate research programme will be implemented as projects in the framework of the existing themes.

A number of projects on the construction of new-generation setups (fragment-separator ACCULINNA-2, new gas-filled recoil separator for the Factory of Superheavy Elements), which are currently being finalized, will form the basis for the corresponding new projects under the theme «Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability» after commissioning these setups.

Recommendations on the JINR Information and Computing Infrastructure

8. Report on the theme “Information and Computing Infrastructure of JINR” and proposal for its extension. T. Strizh

Proposal for a new project: “Multifunctional Information and Computing Complex (MICC)”

Referees: A. Olshevskiy

A. Klimentov

I. Štekl

Z. Vilakazi

The PAC heard a report on the theme “**Information and Computing Infrastructure of JINR**” presented by T. Strizh with proposals for its extension and for the opening, within this theme, of a project for the development of a Multifunctional Information and Computing Complex (MICC).

The PAC emphasizes the importance of the project stages for the development and improvement of the JINR telecommunication and network infrastructure, modernization of the MICC engineering infrastructure, increase in the performance of the heterogeneous and cloud components as well as development of the systems for storing, processing and analysis of data to ensure the implementation of the whole spectrum of competitive world-class research in various scientific areas conducted at JINR and its collaborating centers worldwide.

The PAC strongly supports the implementation and development of a corporate information system of the Institute which is aimed at providing information and software support for the scientific and production activity of JINR within the theme “Information and Computing Infrastructure of JINR”.

The Multifunctional Information and Computing Complex (MICC)

Goal of the Project:

development of the network, information and computing infrastructure of the JINR for scientific and production activity of the JINR and JINR Member State Institutes on the basis of state-of-the-art information technologies following the schedule of the 7-year plan of JINR development for 2017-2023.

Country and Organization:

Armenia (IIAP NAS RA, YSU)	Romania (IFA, IFIN-HH, INCDTIM)
Azerbaijan (IP ANAS)	Russia (FRC"Computer Science and Control" RAS, IITP RAS, ISP RAS, ITEP, KIAM RAS, MPEI, MSU, RCC MSU, RIPN, NRC KI, RSCC, SINP MSU, INR RAS, SCC IPCP RAS, LITP RAS, Dubna Univ., SEZ "Dubna", SCC "Dubna", PNPI, UNN, BINP SB RAS, PSI RAS, IHEP, IMPB RAS, SSAU, ITMO, SPbSU, SPbSPU)
Belarus (NC PHEP BSU, BNTU, JIPNR-Sosny NASB)	Slovakia (IEP SAS)
Bulgaria (INRNE BAS, SU)	South Africa (UCT)
CERN	Sweden (LU)
Czech Republic (IP ASCR)	USA (UTA, Fermilab, BNL)
Egypt (CU)	Ukraine (BITP NASU, NTUU KPI, KFTI)
France (CPPM)	
Georgia (GRENA, TSU, GTU)	
Germany (GSI, DESY, KIT)	
Moldova (ASM, IMCS ASM, IAP ASM, RENAM)	
Mongolia (NUM)	
Poland (CYFRONET)	

Collaborations:

WLCG, RDMS CMS, RDIG

Development plans for the network infrastructure:

Increasing the channel capacity of the external JINR data link: **2 x 100Gbps**

Modernization of optical backbone of the local area network of JINR: **100 Gbps**

Development of network services:

- Implement IPv6
- Use of new data transfer protocols
- Improved email service
- Wi-Fi authorization service
- Project "My Account"

Local network of the NICA project: The projected capacity is stated as a data transmission channel with a throughput of 100 GbE.

PAC Recommendations

The PAC recommends **extension of the theme “Information and Computing Infrastructure of JINR”** and opening of the project for the development of MICC at JINR under the theme, **until the end of 2019.**

The PAC would also like to see more visible evidence of support for JINR laboratories and JINR Member States; a suggestion in that regard could inform of establishment of an appropriate structure to address this matter.

The Scientific Council supports the recommendations taken by the PACs for Particle Physics and Nuclear Physics to extend the theme “Information and Computing Infrastructure of JINR” until the end of 2019 and to open a project under this theme for the development of a Multifunctional Information and Computing Complex (MICC) at JINR (including the Tier1 centre in connection with CERN). The Scientific Council emphasizes the importance of further developing Information Technology within the MICC project aimed at improving the telecommunication and network infrastructure of JINR. This will increase the performance of systems for storing, processing and data analysis as well as further develop heterogeneous and cloud components of the complex to support broad spectrum of world-class research in various areas, conducted at JINR and Member States.

Recommendations on the Draft Seven-Year Plan for the Development of JINR in the field of nuclear physics for 2017–2023

9. Main directions of research in the field of nuclear physics
for 2017–2023

M. Itkis

The PAC thanks M. Itkis for the presentation of the main directions of research in the field of nuclear physics to be pursued in 2017–2023.

The programme is based on the forefront directions of research included in the Seven-Year Plan for the Development of JINR for 2017–2023:

- construction and operation of the SHE Factory;
- modernization of IREN;
- promotion of international cooperation in experiments carried out by JINR, in particular, BAIKAL, SHELS, and ACCULINNA-II;
- contributions to non-accelerator physics experiments and the COMET project.

The PAC congratulates the JINR Directorate for the high quality of the document reflecting the excellent science performed at this international centre.

PAC Recommendation

The PAC supports the proposed directions of the Seven-Year Plan for the Development of JINR in the field of nuclear physics. The PAC recommends that the JINR Directorate present the Draft Seven-Year Plan for the Development of JINR for 2017–2023 for final consideration by the Scientific Council at its next session in September 2016.

120th session of the JINR Scientific Council

The Scientific Council recommends that the JINR Finance Committee and Committee of Plenipotentiaries approve the presented seven-year plan, with an understanding that it will be updated on a year-by-year basis with the actual situation taken into account.

The Scientific Council appreciates the efforts towards integration of JINR's new and updated facilities (NICA, SHE Factory, Baikal-GVD, IBR-2) into the European and worldwide research infrastructures.

The Scientific Council considers that attracting and educating young personnel, especially for running the SHE Factory and the NICA complex, is extremely important, and encourages the JINR Directorate to take all appropriate measures in this direction.



The report “Anthropogenic effects on the coastal phytoplankton studied by neutron activation analysis” was presented by P. Nekhoroshkov at 120th session of the Scientific Council.

Miscellaneous

As suggested by the JINR Directorate, the PAC was informed by the Scientific Secretary of the PAC for Condensed Matter Physics, O. Belov, about the proposals on methods for the evaluation of JINR projects and themes by the Programme Advisory Committees. In view of the current preparation of an update of the Regulation for the JINR PACs to be approved by the Scientific Council, the members of the PAC for Nuclear Physics are invited to give their suggestions for the evaluation methods, in particular, and for the Regulation, in general, until 20 July 2016.

The Scientific Council welcomes the current preparation by the JINR Directorate, with participation of the PACs, of an update of the Regulation for the JINR Programme Advisory Committees and of methods for the evaluation of projects submitted to the PACs, and looks forward to receiving the final version of the Regulation for approval at the next session

The Scientific Council welcomes the current preparation by the JINR Directorate, with participation of the PACs, of an update of the Regulation for the JINR Programme Advisory Committees and of methods for the evaluation of projects submitted to the PACs, and looks forward to receiving the final version of the Regulation for approval at the next session.

Thank you!

Периодическая таблица элементов Д.И. Менделеева (2016 год)



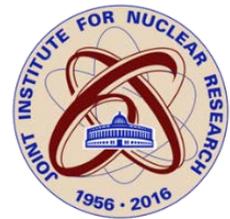
Бор 5 B 10,811 Boron	Углерод 6 C 12,011 Carbon	Азот 7 N 14,0067 Nitrogen	Кислород 8 O 15,9994 Oxygen	Фтор 9 F 18,9984 Fluorine	Неон 10 Ne 20,1797 Neon			
Алюминий 13 Al 26,981539 Aluminum	Кремний 14 Si 28,0855 Silicon	Фосфор 15 P 30,97376 Phosphorus	Сера 16 S 32,066 Sulfur	Хлор 17 Cl 35,4527 Chlorine	Аргон 18 Ar 39,948 Argon			
Никель 28 Ni 58,6934 Nickel	Медь 29 Cu 63,546 Copper	Цинк 30 Zn 65,39 Zinc	Галлий 31 Ga 69,723 Gallium	Германий 32 Ge 72,61 Germanium	Мышьяк 33 As 74,92159 Arsenic	Селен 34 Se 78,96 Selenium	Бром 35 Br 79,904 Bromine	Криптон 36 Kr 83,80 Krypton
Палладий 46 Pd 106,42 Palladium	Серебро 47 Ag 107,8682 Silver	Кадмий 48 Cd 112,411 Cadmium	Индий 49 In 114,818 Indium	Олово 50 Sn 118,710 Tin	Сурьма 51 Sb 121,757 Antimony	Теллур 52 Te 127,60 Tellurium	Иод 53 I 126,90447 Iodine	Ксенон 54 Xe 131,29 Xenon
Платина 78 Pt 195,08 Platinum	Золото 79 Au 196,96654 Gold	Ртуть 80 Hg 200,59 Mercury	Таллий 81 Tl 204,3833 Thallium	Свинец 82 Pb 207,2 Lead	Висмут 83 Bi 208,98037	Полоний 84 Po [209]	Астат 85 At [210]	Радон 86 Rn [222]
Дармштадтий 110 Ds [269] Darmstadtium	Рентгений 111 Rg [272] Roentgenium	Коперниковий 112 Cn [277] Copernicium	(Нихоний) 113 (Nh) [286] (Nihonium)	Флеровий 114 Fl Флеровий	(Московский) 115 (Mc) (Московский)	Ливерморий 116 Lv Ливерморий	(Теннессин) 117 (Ts) (Теннессин)	(Оганессон) 118 (Og) (Оганессон)

105
Db
Dubnium





VIII International Symposium on Exotic Nuclei



Symposium organizers :

JINR, GANIL (France), RIKEN (Japan), GSI (Germany),
Michigan State University (USA), Kazan Federal University (Russia)

160 participants,
including:

Bulgaria	2
Germany	10
Italy	1
Kazakhstan	3
China	1
Russia	77
North Korea	1
USA	5
Finland	3
France	13
South Africa	1
Japan	4

80 oral reports

40 poster presentations



Satellite school "Contemporary
nuclear physics and nuclear medicine"

3-4 September 2015, Institute of Physics KFU

80 young scientists, students, post-graduate students

JINR-60 exhibition, meeting with FKU rectorate

JINR-KFU framework agreement is under preparation



Thank you for your attention!

