Material for the 128th Session
of the JINR Scientific Council
(September 2020)

The full text of the Draft Topical Plan for JINR
Research and International Cooperation 2021 is available at:
http://www.jinr.ru/

PROPOSALS FOR THE PREPARATION OF THE JINR TOPICAL PLAN OF RESEARCH FOR 2021

The total number of themes in the 2020 Topical Plan is 44, including 13 themes and 19 projects concluding in the year 2020.

Theoretical Physics (01)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
1.	BLTP	01-3-1135-2019/2023 Fundamental Interactions of Fields and Particles	I	D. Kazakov O. Teryaev	
2.	BLTP	01-3-1136-2019/2023 Theory of Nuclear Systems	I	N. Antonenko S. Ershov A. Dzhioev4	
3.	BLTP	01-3-1137-2019/2023 Theory of Complex Systems and Advanced Materials	I	V. Osipov A.M. Povolotskii	
4.	BLTP	01-3-1138-2019/2023 Modern Mathematical Physics: Gravity, Supersymmetry and Strings	I	A. Isaev S. Krivonos A. Sorin *Scientific leader:* A. Filippov	
5.	BLTP	01-3-1117-2014/2023 Dubna International Advanced School of Theoretical Physics (DIAS-TH)	I	V. Voronov A. Sorin *DIAS-TH Rector:* A. Filippov	

Elementary Particle Physics and Relativistic Nuclear Physics (02)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
6.	DLNP	02-2-1123-2015/2022 Study of Fundamental Interactions in e^+e^- Collisions	I	A. Zhemchugov *Deputy:* A. Guskov	
		BES-III (2007–2022)	1	A. Zhemchugov	
		ARIeL: Physics at future e^+e^- colliders (2019-2021)	3	L. Kalinovskaya	
7.	All-JINR theme	02-0-1081-2009/2023 ATLAS. Upgrade of the ATLAS Detector and Physics Research at the LHC	I	V. Bednyakov *Deputy:* E. Khramov A. Cheplakov	
		ATLAS. Physics (2010–2023)	1	E. Khramov	
		Upgrade of the ATLAS detector (2013–**2020**) **To extend the project until the end of 2023 with first priority.**	1	A. Cheplakov	**To continue JINR's participation in the ATLAS detector upgrade project for the period 2021–2023 with first priority; to consider unifying the two JINR ATLAS projects** ***(52th meeting of the PAC for PP).***

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8	DLNP	02-2-1124-2015/**2020** Search for New Physics in Experiments with High-Intensity Muon Beams **To close the theme.**	I	V. Glagolev *Deputy:* Yu. Davydov *Scientific leader:* J. Budagov	
		Search for new physics in experiments with high-intensity muon beams (2015–**2020**) **To close the project.**	1	V. Glagolev	
		New theme 02-2-1144-2021/2023 Search for new physics in the charged lepton sector **To open the new theme until the end of 2023 with Priority I.**		V. Glagolev Z. Tsamalaidze	
		New project Search for new physics in the charged lepton sector (2021-2023) **To open the new project until the end of 2023 with first priority.**		V. Glagolev Z. Tsamalaidze	**To approve the project with three experiments for only one year** ***(52th meeting of the PAC for PP).***
9.	DLNP	02-2-1099-2010/2023 Study of Neutrino Oscillations	I	D. Naumov A. Olshevskiy	
		Daya Bay/JUNO (2009–**2020**) **To extend the project until the end of 2023 with first priority.**	1	D. Naumov	**To extend the project until the end of 2023** ***(53th meeting of the PAC for PP).***
		NovA/DUNE (2015–**2020**) **To extend the project until the end of 2023 with first priority.**	1	A. Olshevskiy	**To extend the project until the end of 2023** ***(53th meeting of the PAC for PP).***
10.	All-JINR theme	02-0-1108-2011/**2020** Experiment PANDA at FAIR **To extend the theme until the end of 2021 with Priority I.**	I	G. Alexeev *Deputy:* A. Skachkova	
11.	DLNP	02-2-1125-2015/**2020** Astrophysical Studies in the Experiment TAIGA **To extend the theme until the end of 2023 with Priority I.**	I	L. Tkatchev *Deputies:* V. Grebenyuk A. Borodin	
		TAIGA (2015–**2020**) **To extend the project until the end of 2023 with first priority.**	1	L. Tkatchev	**To extend the project until the end of 2023** ***(53th meeting of the PAC for PP).***
12.	DLNP	02-2-1134-2018/**2020** Experiment COMET at J-PARC **To close the theme.**	I	Z. Tsamalaidze	
13.	VBLHEP	02-1-1106-2011/2022 Investigations of Compressed Baryonic Matter at the GSI Accelerator Complex	I	V. Ladygin V. Ivanov *Deputy:* O. Derenovskaya	
		CBM (2011–**2020**) **Rescheduling obligatory submission of the project from the PAC in June-July 2020 to the PAC in January 2021, extension proposed.**	1	V. Ladygin V. Ivanov	
		HADES (2010–2021)	2	V. Ladygin O. Fateev	

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14.	VBLHEP	02-1-1096-2010/**2022** Study of Rare Charged Kaon Decays and Search for Dark Sector in Experiments at the CERN SPS	I	V. Kekelidze Yu. Potrebenikov *Deputy:* D. Peshekhonov	
		NA62 (2010–2021)	1	V. Kekelidze Yu. Potrebenikov	
		NA64 (2017–2022)	1	V. Matveev D. Peshekhonov	**To continue of JINR's participation in the NA64 project for the period 2021–2023** ***(52th meeting of the PAC for PP).***
15.	All-JINR theme	02-0-1083-2009/2022 CMS. Compact Muon Solenoid at the LHC	I	A. Zarubin *Scientific leader:* I. Golutvin	
		CMS (2010–2023)	1	A. Zarubin I. Golutvin	
		Upgrade of the CMS detector (2013–**2020)** **Rescheduling obligatory submission of the project from the PAC in June-July 2020 to the PAC in January 2021, completion to be shifted.**	1	A. Zarubin I. Golutvin	
16.	All-JINR theme	02-0-1085-2009/2022 Studies of the Nucleon and Hadron Structure at CERN	I	A. Nagaytsev *Deputy:* A. Guskov	
		COMPASS-II (2011–**2020**) **To extend the project until the end of 2022 with first priority.**	1	A. Nagaytsev	**To extend the project until the end of 2022 with first priority** ***(53th meeting of the PAC for PP).***
17.	VBLHEP	02-1-1086-2009/**2020** Strangeness in Hadronic Matter and Study of Inelastic Reactions Near Kinematical Borders **To extend the theme until the end of 2023 with Priority I.**	I	E. Strokovsky E. Kokoulina D. Krivenkov	
		HyperNIS (2010–2021)	1	E. Strokovsky	
18.	All-JINR theme	02-0-1065-2007/2023 NICA Complex: Design and Construction of the Complex of Accelerators, Collider and Physics Experimental Facilities at Extracted and Colliding Ion Beams Aimed at Studying Dense Baryonic Matter and the Spin Structure of Nucleons and Light Ions, and at Carrying out Applied and Innovation Projects	I	V. Kekelidze A. Sorin *Deputy:* A. Kovalenko I. Meshkov Yu. Potrebenikov	
		Nuclotron-NICA (2011–**2020)** **Rescheduling obligatory submission of the project from the PAC in June-July 2020 to the PAC in January 2021, extension proposed.**	1	A. Butenko G Khodzhibagiyan *Scientific leader:* I. Meshkov	
		BM@N (2012–2021)	1	M. Kapishin	
		Subproject SRC: "Probing short-range correlations" (2018–2021)	1	M. Kapishin E. Piasetzky *Deputies:* O. Hen T. Aumann	
		MPD (2011–**2020**) **To extend the project until the end of 2025 with first priority.**	1	V. Golovatyuk V. Kekelidze A. Sorin	**To extend the project until the end of 2025** ***(53th meeting of the PAC for PP).***
		Development of the CDR and TDR for the SPD detector at the NICA collider (2020–2021)	1	A. Guskov *Deputy:* V. Ladygin	

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19.	All-JINR theme	02-1-1127-2016/2023 Advanced Studies on Systems of New-Generation Accelerators and Colliders for Fundamental and Applied Research	I	G. Shirkov *Deputy:* J. Budagov	
		Precision laser metrology for accelerators and detector complexes (2016–2021)	2	J. Budagov	
20.	VBLHEP	02-1-1097-2010/2021 Study of Polarization Phenomena and Spin Effects at the JINR Nuclotron-M Facility	I	A. Kovalenko *Deputies:* N. Piskunov V. Ladygin M. Finger (Jr.) R. Shindin	
		ALPOM-2 (2010–2021)	1	N. Piskunov	
		DSS (2010–2021)	1	V. Ladygin M. Janek K. Sekiguchi	
21.	VBLHEP	02-1-1087-2009/**2020** Research on Relativistic Heavy and Light Ion Physics. Experiments at the Accelerator Complex Nuclotron-NICA at JINR and CERN SPS **To extend the theme until the end of 2023 with Priority I.**	I	A. Malakhov *Deputy:* S. Afanasiev	
		NA61 (2012–2021)	2	A. Malakhov	
		SCAN-3 (2017–2022)	1	S. Afanasiev	
		New project BECQUEREL **To open the new project until the end of 2022 with first priority.**		P. Zarubin	**To present the project at the PAC meeting in January 2021** ***(51th meeting of the PAC for NP).***
		New project FASA (2020–2022) **To open the new project until the end of 2022 with first priority.**			**To reject the project** ***(52th meeting of the PAC for PP).***
22.	All-JINR theme	02-0-1066-2007/2020 Investigation of the Properties of Nuclear Matter and Particle Structure at the Collider of Relativistic Nuclei and Polarized Protons **To extend the theme until the end of 2023 with Priority I.**	I	R. Lednický Yu. Panebratsev	
		STAR (2010–2021)	1	Yu. Panebratsev R. Lednický	
23.	VBLHEP	02-1-1088-2009/2022 ALICE. Study of Interactions of Heavy Ion and Proton Beams at the LHC	I	A. Vodopyanov	
		ALICE (2010–2023)	1	A. Vodopyanov	
		R&D for the ALICE photon spectrometer (2012-**2020)** **Rescheduling obligatory submission of the project from the PAC in June-July 2020 to the PAC in January 2021, completion to be shifted.**	1	A. Vodopyanov	

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24.	VBLHEP	02-1-1107-2011/2021 Development and Construction of the Prototype of a Complex for Radiotherapy and Applied Research with Heavy-Ion Beams at the Nuclotron-M	I	S. Tyutyunnikov	
		E&T&RM (Energy & Transmutation, radiation materials science) (2018–**2020**) **Rescheduling obligatory submission of the project from the PAC in June-July 2020 to the PAC in January 2021, completion to be shifted.**	1	S. Tyutyunnikov	

Nuclear Physics (03)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
25.	All-JINR theme	03-0-1129-2017/2021 Development of the FLNR Accelerator Complex and Experimental Setups (DRIBS-III)	I	G. Gulbekyan S. Dmitriev M. Itkis *Scientific leader:* Yu. Oganessian	
		Construction of a prototype of the initial section of a high-current heavy-ion linear accelerator aimed at producing intense radioactive ion beams for basic research (2020–2021)	1	L. Grigorenko T. Kulevoy	
26.	FLNR	03-5-1130-2017/2021 Synthesis and Properties of Superheavy Elements, Structure of Nuclei at the Limits of Nucleon Stability	I	M. Itkis *Scientific leader:* Yu. Oganessian	
27.	DLNP	03-2-1100-2010/2021 Non-Accelerator Neutrino Physics and Astrophysics	I	V. Brudanin A. Kovalik E. Yakushev	
		SuperNEMO (2013–2021)	1	O. Kochetov	
		GEMMA-II (2010–2021)	1	V. Brudanin	
		EDELWEISS-II (2010–2021)	1	E. Yakushev	
		G&M (GERDA) (2010–2021)	1	K. Gusev	
		DANSS (2011–2021)	1	V. Brudanin V. Egorov	
		BAIKAL (2009–2023)	1	I. Belolaptikov V. Brudanin	
		New project MONUMENT (2021-2023) **To open the new project until the end of 2023 with first priority.**		D. Zinatulina	**To open the new project for 2021–2023** ***(52th meeting of the PAC for NP).***
28.	DLNP	03-0-1102-2010/**2020** Improvement of the JINR Phasotron and Design of Cyclotrons for Fundamental and Applied Research **To close the theme.**	I	G. Karamysheva S. Yakovenko	**To continue the studies within the framework of one of the themes of the DLNP** ***(52th meeting of the PAC for NP).***
29.	FLNP	03-4-1128-2017/**2022** Investigations of Neutron Nuclear Interactions and Properties of the Neutron	I	*E. Lychagin* *Deputies:* *Yu. Kopatch* *P. Sedyshev*	
		TANGRA (2014–**2022**)	1	Yu. Kopatch	

Condensed Matter Physics, Radiation and Radiobiological Research (04)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
30	FLNP	04-4-1121-2015/**2020** Investigations of Condensed Matter by Modern Neutron Scattering Methods **To close the theme.**	I	D. Kozlenko V. Aksenov A. Balagurov	**To close the theme** ***(52th meeting of the PAC for CMP).***
		ELCHEM-NS (2018–**2020**) **To close the project.**	1	M. Avdeev *Deputies:* V. Petrenko I. Bobrikov	**To close the project** ***(52th meeting of the PAC for CMP).***
		New theme 04-4-1142-2021/2025 Investigations of Functional Materials and Nanosystems by Neutron Scattering Methods **To open a new theme for 2021–2025 with Priority I.**		D. Kozlenko V. Aksenov A. Balagurov	**To open a new theme for 2021–2025.** ***(52th meeting of the PAC for CMP).***
		New project Development of an Inelastic Neutron Scattering Spectrometer in Inverse Geometry at the IBR 2 Reactor (2021–2023) **To open a new project for 2021-2023** (first stage) **with first priority.**		D. Chudoba	**To open a new project for 2021-2023** ***(52th meeting of the PAC for CMP).***
31.	FLNP	04-4-1105-2011/2022 Development of the IBR-2 Facility with a Complex of Cryogenic Neutron Moderators	I	*A. Vinogradov* *A. Belushkin* *A. Dolgikh*	
		Construction of a complex of cryogenic moderators at the IBR-2 facility (2014–2022)	1	*K. Mukhin*	
32.	FLNP	04-4-1122-2015/**2020** Development of Experimental Facilities for Condensed Matter Investigations with Beams of the IBR-2 Facility **To close the theme.**	I	S. Kulikov V. Prikhodko V. Bodnarchuk	**To close the theme** ***(52th meeting of the PAC for CMP).***
		Development of PTH sample environment system for the DN-12 diffractometer at the IBR-2 facility (2015–**2020**) **To close the project.**	1	A. Chernikov	**To close the project** ***(52th meeting of the PAC for CMP).***
		BSD (2018–**2020**) **To close the project.**	1	V. Kruglov	**To close the project** ***(52th meeting of the PAC for CMP).***
		New theme 04-4-1143-2021/2025 Scientific and methodological research and developments for condensed matter investigations with IBR-2 neutron beams **To open a new theme for 2021–2025 with Priority I.**		S. Kulikov V. Prikhodko V. Bodnarchuk	**To open a new theme for 2021–2025** ***(52th meeting of the PAC for CMP).***
		New project Construction of a wide-aperture backscattering detector (BSD) for the HRFD diffractometer (2021–2023) **To open a new project for 2021-2023 with first priority.**		V. Kruglov	**To open a new project for 2021-2023** ***(52th meeting of the PAC for CMP).***
33.	FLNP	04-4-1133-2018/**2020** Modern Trends and Developments in Raman Microspectroscopy and Photoluminescence for Condensed Matter Studies **To extend the theme until the end of 2023 with Priority I.**	I	G. Arzumanyan N. Kučerka	**To extend the theme until the end of 2023** ***(52th meeting of the PAC for CMP).***
		NANOBIOPHOTONICS (2018–**2020**) **To close the project.**	1	G. Arzumanyan N. Kučerka *Deputy:* K Mamatkulov	**To close the project** ***(52th meeting of the PAC for CMP).***
		New project Raman microspectroscopy in biomedical studies (Biophotonics) (2021–2023) **To open a new project for 2021–2023 with first priority.**		G. Arzumanyan K. Mamatkulov	**To open a new project for 2021-2023** ***(52th meeting of the PAC for CMP).***

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
34.	FLNP	04-4-1140-2020/2022 Development of the Conceptual Design of a New Advanced Neutron Source at JINR	I	V. Shvetsov S. Kulikov	
35.	FLNP	04-4-1141-2020/2022 Development of the SOLCRYS Structural Research Laboratory at the SOLARIS National Synchrotron Radiation Centre	I	N. Kučerka	
36.	FLNR	04-5-1131-2017/2021 Radiation Physics, Radiochemistry and Nanotechnology Investigations Using Beams of Accelerated Heavy Ions	I	S. Dmitriev P. Apel	
37.	LRB	04-9-1077-2009/**2020** Research of the Biological Effect of Heavy Charged Particles with Different Energies **To extend the theme until the end of 2023 with Priority I.** **Theme leader:** **E. Krasavin** **A. Bugay**	I	E. Krasavin G. Timoshenko	**To extend the theme until the end of 2023** ***(52th meeting of the PAC for CMP).***
		Research of the biological effect of heavy charged particles with different energies (2015–**2020**) **To extend the project until the end of 2023 with first priority.** **Project leader:** **E. Krasavin** **A. Bugay**	1	E. Krasavin G. Timoshenko	**To extend the project until the end of 2023** ***(52th meeting of the PAC for CMP).***
38.	LRB	04-9-1112-2013/2022 Research on Cosmic Matter on the Earth and in Nearby Space; Research on the Biological and Geochemical Specifics of the Early Earth	I	E. Krasavin A. Rozanov V. Shvetsov (FLNP)	
		Research on cosmic matter on the Earth and in nearby space; research on the biological and geochemical specifics of the early Earth (2013–2022)	1	E. Krasavin *Scientific leader:* A. Rozanov	
39.	DLNP	04-2-1132-2017/2022 Biomedical and Radiation-Genetic Studies Using Different Types of Ionizing Radiation	I	G. Mitsin *Deputy:* S. Shvidky	
		Further development of methods, technologies, schedule modes and delivery of radiotherapy (2017–2022)	1	G. Mitsin K. Voskanyan	
		RADIOGENE: Molecular genetics of radiation-induced changes at the gene, genome and transcriptome level in *Drosophila melanogaster* (2017–2022)	1	I. Alexandrov	
		New project Study of the radioprotective properties of the Damage Suppressor (Dsup) protein on a model organism D. melanogaster and human cell culture HEK293T **To open a new project for 2021-2023 with first priority.**		E. Kravchenko	**To open the new project for 2021-2022** ***(52th meeting of the PAC for CMP).***

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
40.	DLNP	04-2-1126-2015/**2020** Novel Semiconductor Detectors for Fundamental and Applied Research **To extend the theme until the end of 2023 with Priority I.**	I	G. Shelkov *Deputy:* A. Zhemchugov	**To extend the theme for 2021-2023** ***(52th meeting of the PAC for CMP).***
		Novel semiconductor detectors for fundamental and applied research (2015–**2020**) **To extend the project until the end of 2023 with first priority.**	1	G. Shelkov	**To extend the project for 2021-2023** ***(52th meeting of the PAC for CMP).***
		Development of the experimental techniques and applied research with slow monochromatic positron beams (PAS) (2016–**2020**) **To extend the project until the end of 2023 with first priority.**	1	A. Kobets P. Horodek *Scientific leader:* I. Meshkov	**To extend the project for 2021-2023** ***(52th meeting of the PAC for CMP).***
		GDH&SPASCHARM (2011–2022)	1	Yu. Usov A. Kovalik4	

Networking, Computing, Computational Physics (05)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by Science and Technology Council of Laboratory	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
41.	LIT	05-6-1118-2014/2023 Information and Computing Infrastructure of JINR	I	V. Korenkov *Deputy:* T. Strizh	
		MICC (2017–2023)	1	V. Korenkov	
42.	LIT	05-6-1119-2014/2023 Methods, Algorithms and Software for Modeling Physical Systems, Mathematical Processing and Analysis of Experimental Data	I	Gh. Adam P. Zrelov	
43.	SOD	05-8-1037-2001/2024 Analytical and Methodological Work to Assess the Prospect of Scientific Research and Cooperation in the Main Directions of JINR's Development. Organization of International Cooperation	I	A. Sorin	

Educational Programme (06)

№№	Laboratory	Theme code Theme title Project title (timescales) Proposal by FYC	Priority in 2020	Theme (project) leader	Recommendations of the PACs (January, June, July 2020)
44.	All-JINR theme	06-0-1139-2019/2023 Organization, Support and Development of the JINR Human Resources Programme	I	V. Matveev S. Pakuliak	
		New project Open information and educational environment for supporting fundamental and applied multidisciplinary research at JINR (2021–2023) ***To open a new project for 2021–2023.***		Yu. Panebrattsev	***To open a new project for 2021–2023*** ***(51th meeting of the PAC for CMP).***

A. Sorin
Chief Scientific Secretary