CREMLINplus
WP8 Kick-off

Overview of a 4-year EU-Russian Project

Funded under Horizon 2020
Grant agreement no. 871072

CREMLIN PLUS
Connecting Russian and European Measures for Large-scale Research Infrastructures

Martin Sandhop
Hamburg, 27.04.2020

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY.

From CREMLIN to CREMLINplus

- 1.5 years ago: CREMLIN Closing Conference June 2018 at DESY
- Seen from now: CREMLIN was a preparator and pathfinder for CREMLINplus
- CSA Project; DESY coordinator
- „First **CREMLIN Recommendations** for the European-Russian Megascience Cooperation“

  → basis for follow-up project

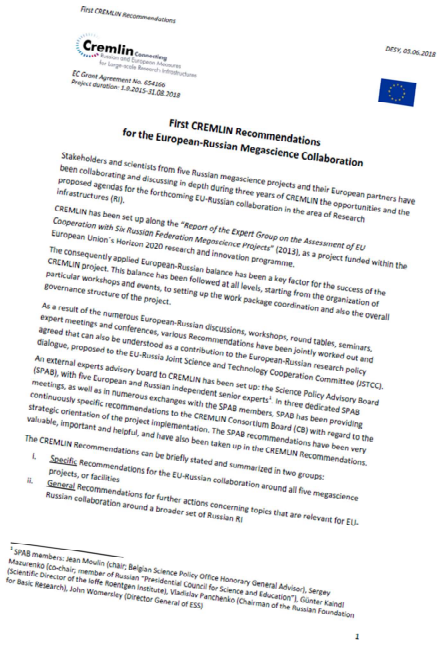
CREMLIN Closing Conference, June 2018, DESY
Picture: M. Mayer

From CREMLIN to CREMLINplus

Recommendations

Two sets of recommendations:

- Specific Recommendations for the EU-Russian collaboration around all five megascience projects, or facilities
- General Recommendations for further actions concerning topics that are relevant for EU-Russian collaboration around a broader set of Russian R
- **Naming "CREMLINplus"** motivated by this special and strong link from one project to the next



First CREMLIN Recommendations

Cremlin

DESY, 05.06.2018

EC Grant Agreement No. 654206
Project duration: 1.9.2015-31.08.2018

First CREMLIN Recommendations for the European-Russian Megascience Collaboration

Stakeholders and scientists from five Russian megascience projects and their European partners have been collaborating and discussing in depth during three years of CREMLIN the opportunities and the proposed agendas for the forthcoming EU-Russian collaboration in the area of Research Infrastructures (RI).

CREMLIN has been set up along the *"Report of the Expert Group on the Assessment of EU Cooperation with Six Russian Federation Megascience Projects"* (2013), as a project funded within the European Union's Horizon 2020 research and innovation programme.

The consequently applied European-Russian balance has been a key factor for the success of the CREMLIN project. This balance has been followed at all levels, starting from the organization of particular workshops and events, to setting up the work package coordination and also the overall governance structure of the project.

As a result of the numerous European-Russian discussions, workshops, round tables, seminars, expert meetings and conferences, various Recommendations have been jointly worked out and agreed that can also be understood as a contribution to the European-Russian research policy dialogue, proposed to the EU-Russia Joint Science and Technology Cooperation Committee (JSTCC).

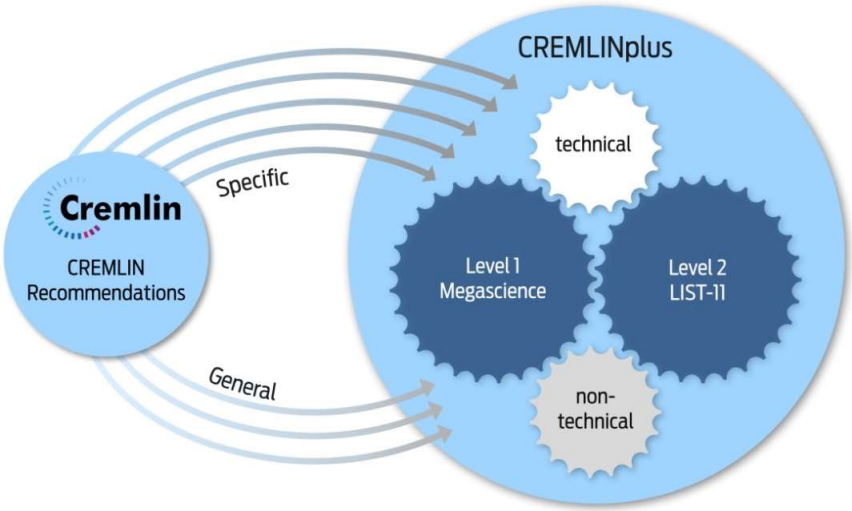
An external experts advisory board to CREMLIN has been set up: the Science Policy Advisory Board (SPAB), with five European and Russian independent senior experts[1]. In three dedicated SPAB meetings, as well as in numerous exchanges with the SPAB members, SPAB has been providing continuously specific recommendations to the CREMLIN Consortium Board (CB) with regard to the strategic orientation of the project implementation. The SPAB recommendations have been very valuable, important and helpful, and have also been taken up in the CREMLIN Recommendations.

The CREMLIN Recommendations can be briefly stated and summarized in two groups:

i. Specific Recommendations for the EU-Russian collaboration around all five megascience projects, or facilities
ii. General recommendations for further actions concerning topics that are relevant for EU-Russian collaboration around a broader set of Russian RI

[1] SPAB members: Jean Moulin (chair, Belgian Science Policy Office Honorary General Advisor), Sergey Mazurenko (Co-chair, member of Russian "Presidential Council for Science and Education"), Günter Kaindl (Scientific Director of the Ioffe Roentgen Institute), Vladislav Panchenko (Chairman of the Russian Foundation for Basic Research), John Womersley (Director General of ESS)

1



Altogether more than 10 years…

2013-2024

2013

EU Expert Report

Cremlin Connecting Russian and European Measures for Large-scale Research Infrastructures

2015-2018

CREMLIN project

CREMLIN PLUS
Connecting Russian and European Measures for Large-scale Research Infrastructures

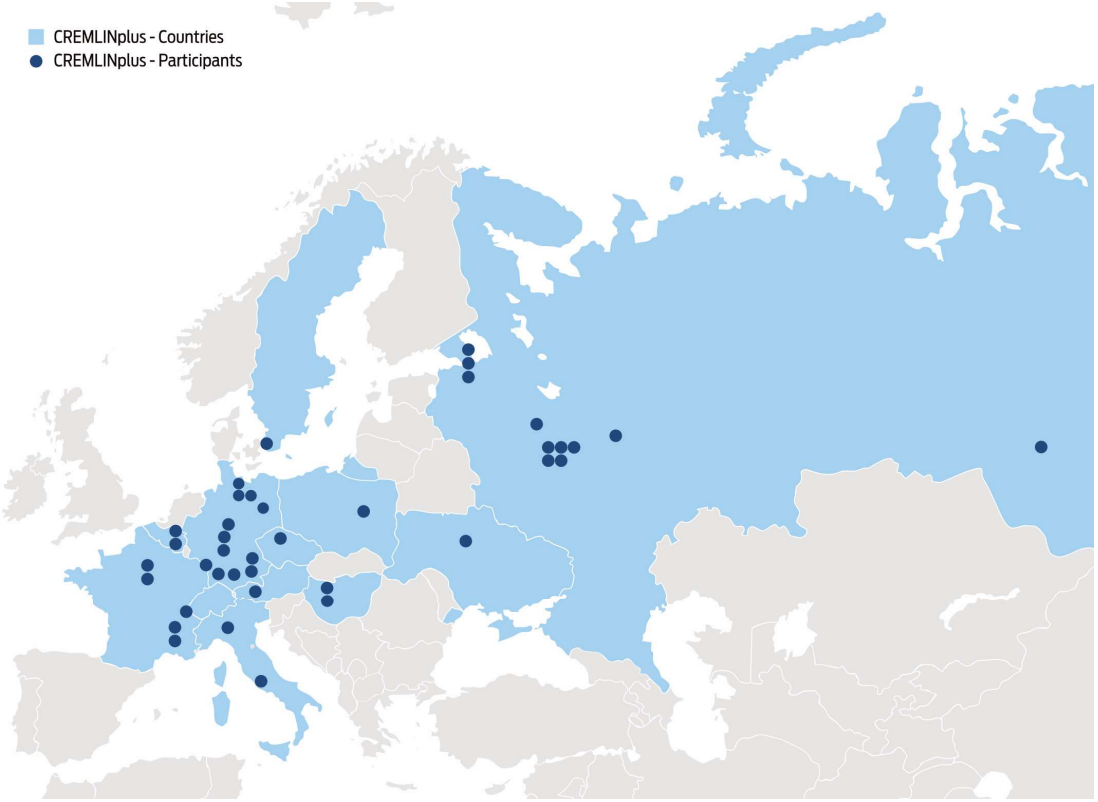
2020-2024

CREMLINplus project

Facts about CREMLINplus

A European-Russian flagship project

- Funded under EU´s Research and innovation Programme Horizon 2020
- EU´s **Flagship project** in the EU-Russian cooperation in the domain of RI
- CREMLINplus is a Research and Innovation Action (RIA), following INFRASUPP-01-2018-2019
- Project duration: 4 years, 01.02.2020-31.01.2024
- **Budget: 25 million EUR**
- **Consortium: 35 partners**
- Building on “First CREMLIN Recommendations”
- Coordinator: DESY



Nice Start of project and first activities

- Project kick-off workshop
- Consortium agreement (CA): all signed
- General Assembly (GA): established
- Executive Board (EB): established
- Project website: www.cremlinplus.eu under construction
- First activities already in February and March
- First meeting of the Executive Board as videocon 03/04/2020

Project kick-off 19-20 Feb 2020, DESY Hamburg

But then…

- **But then:**

The virus came…

Consortium

- Consortium with 35 participants
- Much **extended** CREMLINplus consortium, building on CREMLIN consortium (19 participants)
- **EU MS & Associated Countries**: 25 partners from 9 countries

  DE, FR, CZ, HU, IT, PL, BE, CH, UA
- **Russian Federation**: 10 partners

  Moscow, Saint Petersburg & Gatchina, Dubna, Nizhniy Novgorod, Novosibirsk

List of participants

Participant No *	Participant short name	Participant organisation name	Country
1	DESY	Stiftung Deutsches Elektronen-Synchrotron	DE
2	BINP	Budker Institute of Nuclear Physics of SB RUS	RU
3	IAP	Institute of Applied Physics, Russian Academy of Sciences	RU
4	ICISTE	International Centre for Innovations in Science, Technology and Education	RU
5	INR RAS	Institute for Nuclear Research of the Russian Academy of Sciences	RU
6	JINR	Joint Institute for Nuclear Research	RU
7	MEPhI	National Research Nuclear University "MEPhI"	RU
8	NRC KI	National Research Center "Kurchatov Institute"	RU
9	NUST MISIS	National University of Science and Technology MISIS	RU
10	PTI	IOFFE Physico-Technical Institute of the Russian Academy of Sciences	RU
11	SPSU	Saint Petersburg State University	RU
12	EKUT	Eberhard Karls Universität Tübingen	DE
13	European XFEL	European X-Ray Free-Electron Laserfacility GmbH	DE
14	FAIR	Facility for Antiproton and Ion Research in Europe GmbH	DE
15	FZJ	Forschungszentrum Jülich GmbH	DE
16	GUF	Johann Wolfgang Goethe-Universität Frankfurt am Main	DE
17	HZG	Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH	DE
18	JLU	Justus-Liebig-Universität Giessen	DE
19	TUM	Technische Universität München	DE
20	CEA	Commissariat à l'Énérgie Atomique et aux Énérgies Alternatives	FR
21	ESRF	European Synchrotron Radiation Facility	FR
22	ILL	Institut Max von Laue - Paul Langevin	FR
23	CNRS	Centre National de la Recherche Scientifique	FR
24	UCA	Université Clermont Auvergne	FR
25	ELI-DC AISBL	Association Internationale Extreme-Light-Infrastructure Delivery Consortium	BE
26	NPI CAS	Nuclear Physics Institute, Czech Academy of Science	CZ
27	MTA EK	Magyar Tudomanyos Akademia Energiatudomanyi Kutatokozpont	HU
28	Wigner RCP	Magyar Tudomanyos Akademia Wigner Fizikai Kutatokozpont	HU
29	INFN	Istituto Nazionale di Fisica Nucleare	IT
30	UNIMIB	Università degli Studi di Milano-Bicocca	IT
	ADSI (LTP*)	Austrian Drug Screening Institute GmbH	AT
31	CERN	European Organization for Nuclear Research	CH
32	WUT	Politechnika Warszawska	PL
33	ESS	European Spallation Source ESS ERIC	SE
34	INR NASU	Institute for Nuclear Research of NAS of Ukraine	UA
35	LLE-AISBL	Laserlab-Europe AISBL	BE

*No. Official participant number; *LTP: Linked Third Party*

Some more features of the project…

10 Russian partners: 4 also in CREMLIN; 6 joined

BINP	Budker Institute of Nuclear Physics of SB RUS
IAP	Institute of Applied Physics, Russian Academy of Sciences
ICISTE	International Centre for Innovations in Science, Technology and Education
INR RAS	Institute for Nuclear Research of the Russian Academy of Sciences
JINR	Joint Institute for Nuclear Research
MEPhI	National Research Nuclear University "MEPhI"
NRC KI	National Research Center "Kurchatov Institute"
NUST MISIS	National University of Science and Technology MISIS
PTI	IOFFE Physico-Technical Institute of the Russian Academy of Sciences
SPSU	Saint Petersburg State University

25 European partners: 12 also in CREMLIN; 13 joined

DESY	Deutsches Elektronen-Synchrotron
EKUT	Eberhard Karls Universität Tübingen
European XFEL	European X-Ray Free-Electron Laserfacility GmbH
FAIR	Facility for Antiproton and Ion Research in Europe GmbH
FZJ	Forschungszentrum Jülich GmbH
GUF	Johann Wolfgang Goethe-Universität Frankfurt am Main
HZG	Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH
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WUT	Politechnika Warszawska
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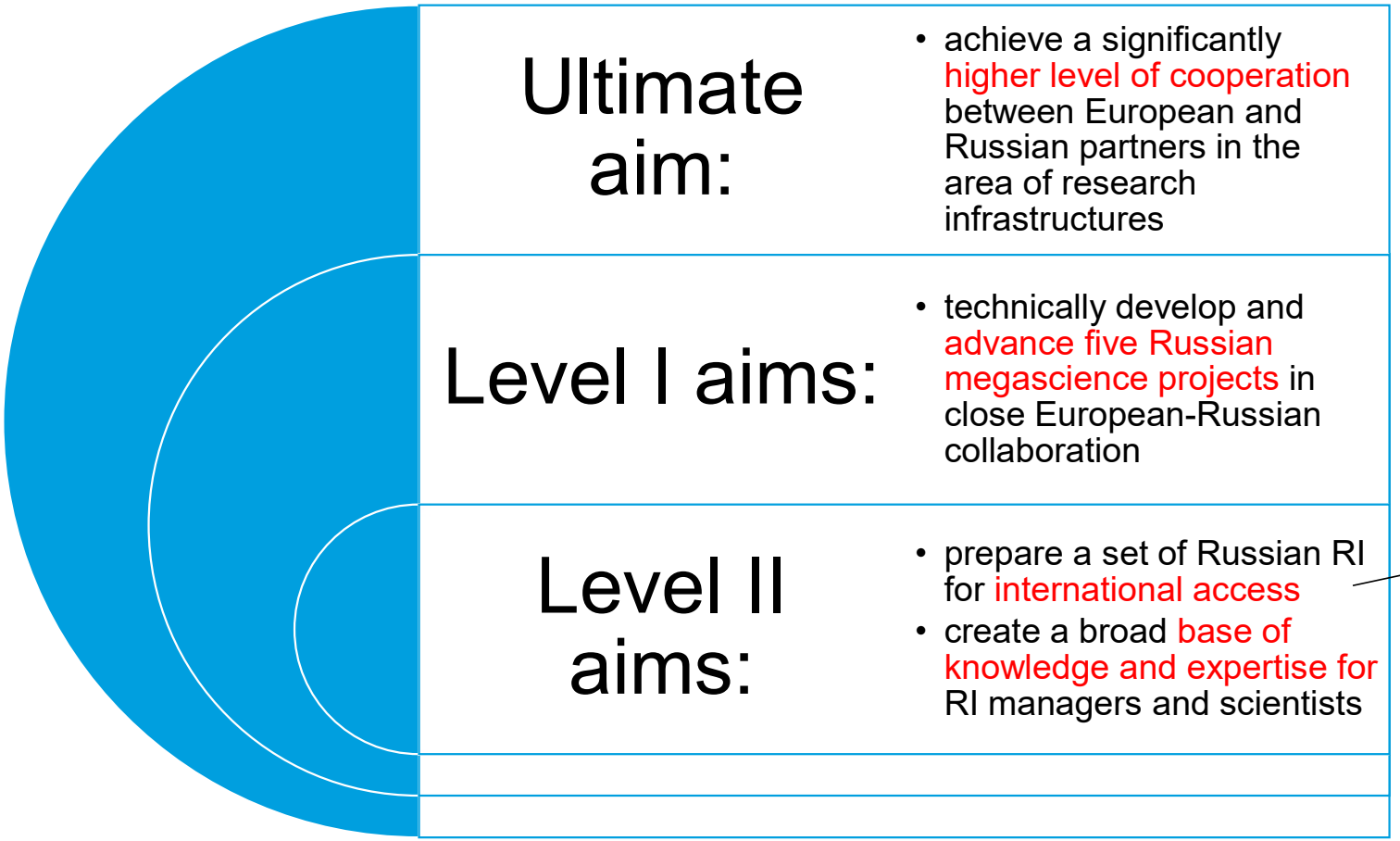
INR NASU	Institute for Nuclear Research of NAS of Ukraine
LLE-AISBL	Laserlab-Europe AISBL

Aim of the project



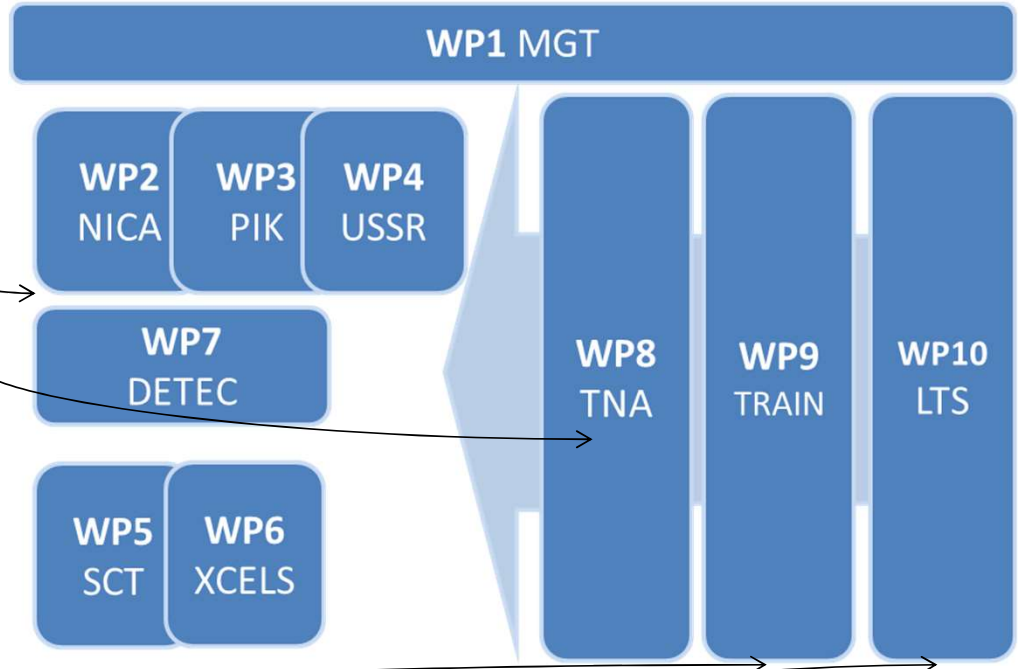
Access to Russian RI: important task for the project

- Proposal evaluators mention: „implementation of **open access** … to services, resources and data by both EU and Russian facilities“ = „tremendous challenge“
- Needs more clarification: „How the **recommendations to set open access** … should reach the **legislative level** necessary to harmonise .. standards in EU and in Russia“
- Also pressing: „..access of EU researchers to Russian facilities needs a **swift development of rules and processes**“

All this will be given special attention in WP8 TNA, at LIST-11 level and beyond.

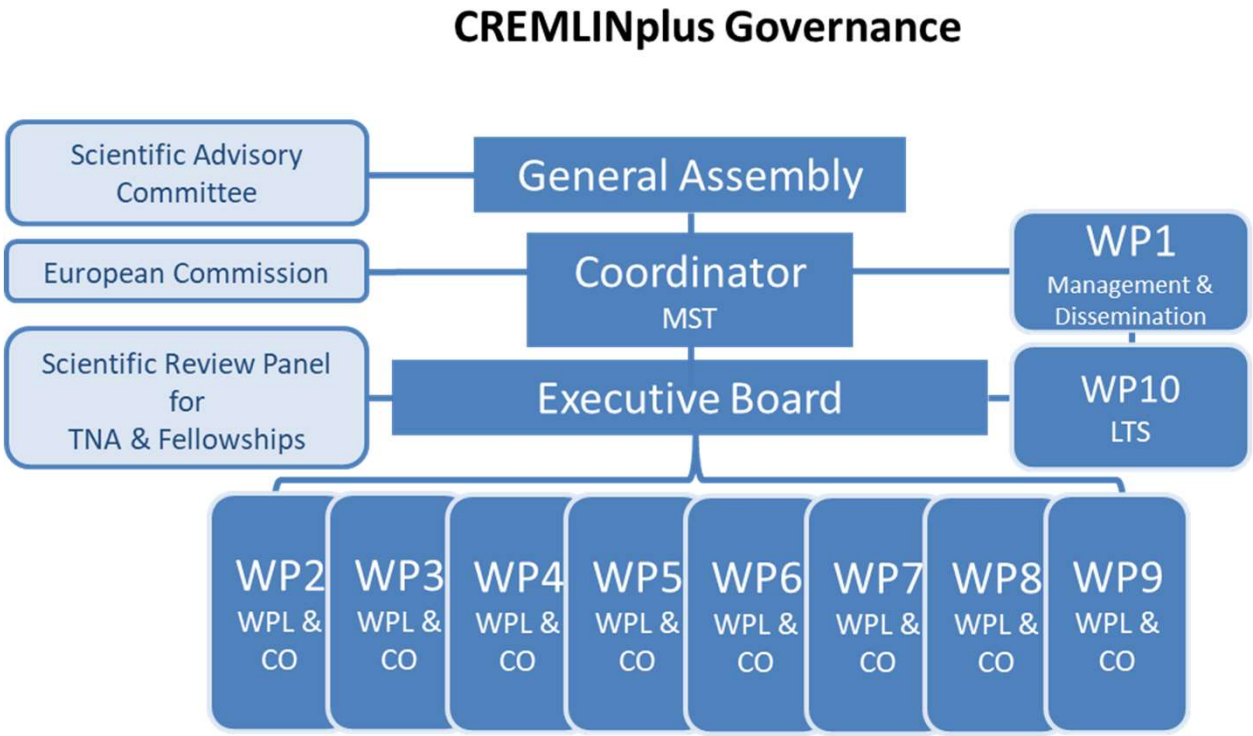
Structure of the project

- Pillar 1: **Megascience collaboration**
  - around PIK, NICA, USSR, SCT, XCELS; joint development of detector technologies
- Pillar 2: **ACCESS**
  - **Facilitate the access** of EU scientists to Russian Research Infrastructures for a defined set of Russian RI "**LIST-11**" covering all 6 thematic domains of ESFRI Roadmap
  - Working out **Recommendations** for setting models and access conditions to selected Russian RIs
- Pillar 3: Develop **staff exchange programme and training for RI management**
- Ensuring **WP-interaction**, addressing **cross-topical issues** for all



Governance

- **General Assembly** (GA): decision-making; annual meetings
- **Executive Board** (EB): engine of the project; quarterly; = WP lead tandems, following policy of **shared responsibility**
- **Scientific Advisory Committee** (SAC): recommendations to GA
- **Scientific Review Panel**: evaluates proposals within several calls in WP8 TNA and WP9 TRAIN
- **Management Support Team** (MST): to be set up with members not only from DESY



WP overview

WP1 MGT	**Management and dissemination**	**DESY & NRC KI BINP; IAP; ICISTE; FAIR; FZJ; UNIMIB**
WP2 NICA	Collaboration with NICA	FAIR & JINR INR RAS; MEPhI; EKUT; NPI CAS; Wigner RCP; WUT
WP3 PIK	Collaboration with PIK	FZJ & NRC KI-PNPI JINR; PTI; SPSU; HZG; TUM; CEA-LLB; ILL; UCA; MTA EK; UNIMIB; ESS
WP4 USSR	Collaboration with USSR	NRC KI & ESRF DESY; European XFEL; INFN
WP5 SCT	Joint technology development around SCT and future lepton colliders	BINP & CERN JLU; CNRS-LAL; INFN
WP6 XCELS	Joint technology development around XCELS	IAP & CEA-LIDYL ELI-DC AISBL; Laserlab-Europe AISBL
WP7 DETEC	Joint development of detector technologies	FAIR & JINR DESY; BINP; NRC KI-PNPI; GUF; CNRS-IPHC; UNIMIB; CERN; ESS; INR NASU
WP8 TNA	Access to Russian RI	ICISTE & DESY NRC KI; NUST MISIS
WP9 TRAIN	Staff exchange and training for RI management	UNIMIB & NUST MISIS DESY
WP10 LTS	Joint long-term sustainability of Ris	NRC KI & DESY

5 Russian megascience projects

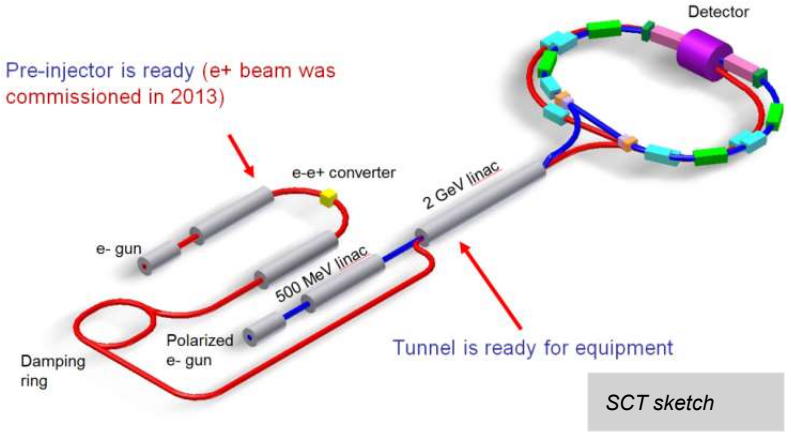
- **NICA**: Superconducting accelerator complex („Nuclotron-based ion collider facility“); Dubna (JINR): e.g. develop instrumentation for NICA and FAIR/CBM; perform prototyping, construction and installation of detectors,…
- **PIK**: High-flux research reactor (International Centre for Neutron Research, ICNR); Gatchina (NRC KI PNPI): e.g. Joint development of advanced cold neutron sources; Joint development of instrumentation concept for PIK
- **USSR**: Ultima Synchrotron Storage Ring; Protvino (NRC KI IHEP: Development of USSR in three main areas: infrastructure, accelerator, experiments; Develop CDR and TDR

PIK

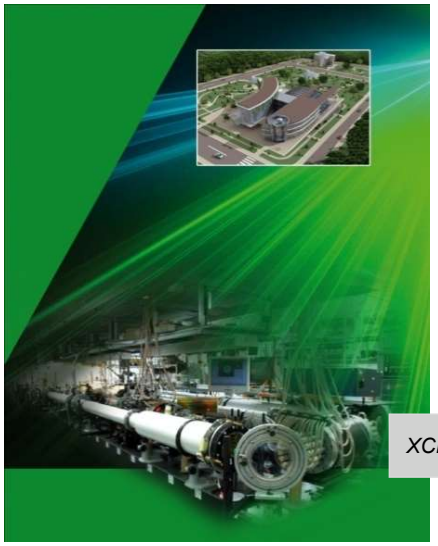
USSR sketch, NRC KI

5 Russian megascience projects

- **SCT**: Lepton Collider „Super Charm-Tau Factory“; Novosibirsk (BINP): e.g. Develop collider technologies and forster synergy between SCT, CLIC and FCC; develop software and design for SCT detector
- **XCELS**: High power laser „Exawatt Center for Extreme Light Studies”; Nizhniy Novgorod (IAP RAS): e.g. Pulse compression in nonlinear optical devices; advanced metrology of ultrashort beams



SCT sketch


XCELS

LIST-11 Facilities

- List of **19 Russian Research infrastructures**, hosted by 11 „operating organisations“
- Facilities for conducting reasearch in 6 domains: „Science centres for collective use“
- Open for users from Russia as well as from EU
- **→especially addressed in WP8:** WP8 TNA will develop and apply access model with LIST-11, inviting EU scientists to use and do experiments at these facilities
- Also **5 Russian megascience projects** invited: knowledge transfer around European Charter of Access, and in the domain „access to scientific data“

List of Russian priority research infrastructures: "LIST-11 facilities"
(in bold: CREMLINplus consortium participants)

No.	Founding ("operating") organisation	Name of research infrastructures	Domain
1	Federal Scientific Research Centre "Crystallography and Photonics", Russian Academy of Sciences	Shared Research Center of FSRC "C&F" "Structural diagnostic of materials"	H&F PSE
2	**National Research Center "Kurchatov Institute" NRC KI**	The Kurchatov complex for synchrotron-neutron researches	PSE
3	**Saint Petersburg State University SPSU**	Research Park SPbU	ENV H&F PSE DIGIT
4	Institute of cytology and genetics of Siberian Branch of the Russian academy of science	Genetic Resources Center for laboratory animals	ENV H&F
5	**Joint Institute for Nuclear Research JINR**	SHE Factory (Factory of SuperHeavy Elements)	PSE
		Cyclotron complex	ENE
		Pulsed fast reactor IBR-2	ENE
		IREN (Intense REsonance Neutron Source)	ENE
6	**Institute for Nuclear Research INR Joint Institute for Nuclear Research JINR**	Baikal-GVD: Baikal deep water neutrino telescope	PSE
7	**Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences BINP**	Novosibirsk Free Electron Laser, terahertz range (NovoFEL)	PSE
		Complex of electron-positron collider VEPP-4-VEPP-2000	H&F PSE
		Complex of Long Open Traps	ENE ENV PSE
		Siberian Synchrotron and Terahertz Radiation Centre	ENE ENV PSE
8	Special Astrophysical Observatory of the Russian Academy of Sciences	BTA	PSE
		RATAN-600	PSE
9	Northern (Arctic) Federal University named after M.V. Lomonosov	Core Facility Center "Arktika"	ENV
10	National Research University Higher School of Economics	Russian Longitudinal Monitoring Survey (RLMS-HSE)	H&F SCI
		The Joint Economic and Social Data Archive (JESDA)	SCI
11	National Medical Research Center for Obstetrics, Gynecology and Perinatology, Ministry of Healthcare	Research Biobank for Reproductive Biology and Medicine	H&F ENV

Domains: ENE Energy, ENV Environment, H&F Health & Food, PSE Physical Science & Engineering, SCI Social & Cultural Innovation, DIGIT Digital Research (according to ESFRI Roadmap 2018 Landscape Analysis)

WP8 Access to Russian RI

- **Consortium:** ICISTE & DESY; NRC KI; NUST MISIS
- **Budget** 2.43 M€
- **Objectives**:
  - contribute to overcome the barriers that prevent European scientists from accessing Russian research infrastructures (Russian RIs) of European interest
  - supporting Russian facilities in setting-up the appropriate access conditions
  - setting up a helpdesk and cover the travel and subsistence of European researchers accessing Russian RIs
  - a particular focus will be on the recommendation list of 11 priority RIs provided by the Russian Federation (LIST-11)

WP9 Staff exchange and training for RI management

- **Consortium:** UNIMIB & NUST MISIS (coordinating partners); DESY
- **Budget** 2.74 M€
- **Objectives**:
  - develop a fellowship/bursary and staff exchange programme
  - provide access to thematic conferences, workshops, summer schools
  - foster exchanges of best practices on management practices, trans national access including user services
  - train staff of Russian RIs on operating RIs with international user community
  - foster sustainable collaborations between RI Staff (Scientists, Managers and Administrators) coming from both the Russian Federation and European Union
  - enhance intercultural communication skills, all tasks

Advanced Materials Design at X-ray and Neutron Facilities
RACIRI SUMMER SCHOOL 2019

WP10 Joint long-term sustainability of RIs

- **Consortium:** NRC KI & DESY
- **Budget** 0.44 M€
- **Objectives/ Tasks**:
  - Promote synergies between the Russian and EU RIs and communities: workshops on management & governance; on complementarity of instrumentations; on legal issues of RI operation; on intercultural communication challenges
  - Link Russian megascience projects to EU strategic initiatives
  - Organise workshop on innovation and technology transfer around RI to raise awareness of the innovation potential of the RIs as key drivers for the development of a competitive knowledge-based economy
  - Organise international workshop on the role of RI in Science Diplomacy to stimulate dialogue between scientists and policymakers
  - Organise workshop on socio-economic impact of RI to raise awareness and knowledge on socio-economic impact of RIs

Thank you.

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

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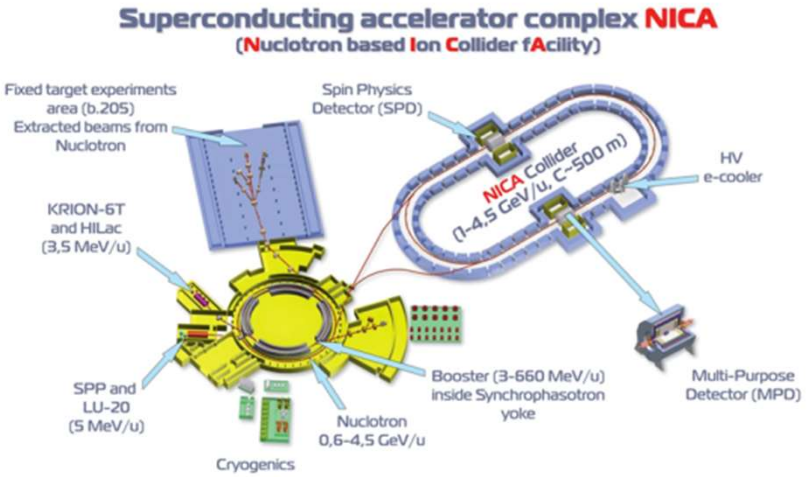
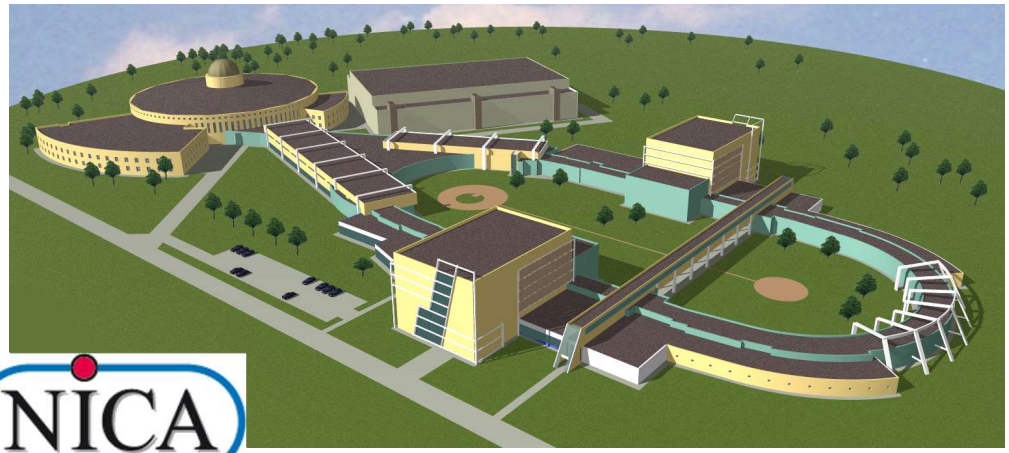
BACK UP

WP 2 Collaboration with NICA

- **Consortium** FAIR & JINR (coordinating partners) and INR RAS; MEPhI; EKUT; NPI CAS; Wigner RCP; WUT
- **Budget** 4.6 MEUR
- **Objectives**:
- develop the instrumentation for NICA and FAIR/CBM:
- To perform the prototyping, construction and installation of detectors
- To develop the data acquisition chain, computing procedures, software packages for simulation and data analysis





WP 3 Collaboration with PIK

- **Consortium** FZJ & NRC KI-PNPI (coordinating partners) and JINR; PTI; SPSU; HZG; TUM; CEA-LLB; ILL; UCA; MTA EK; UNIMIB; ESS
- **Budget** 4.35 MEUR
- **Objectives**:
  - Joint development of advanced cold neutron sources
  - Joint development of the instrumentation concept for reactor PIK
  - Establish international bodies at PIK: PIK-SAC
  - Development of the neutron user-based education platform and an user system
  - Support strategic coordination of PIK in the whole
  - Initiate a **dialogue with LENS**

LENS LEAGUE OF ADVANCED EUROPEAN NEUTRON SOURCES

WP4 Collaboration with USSR

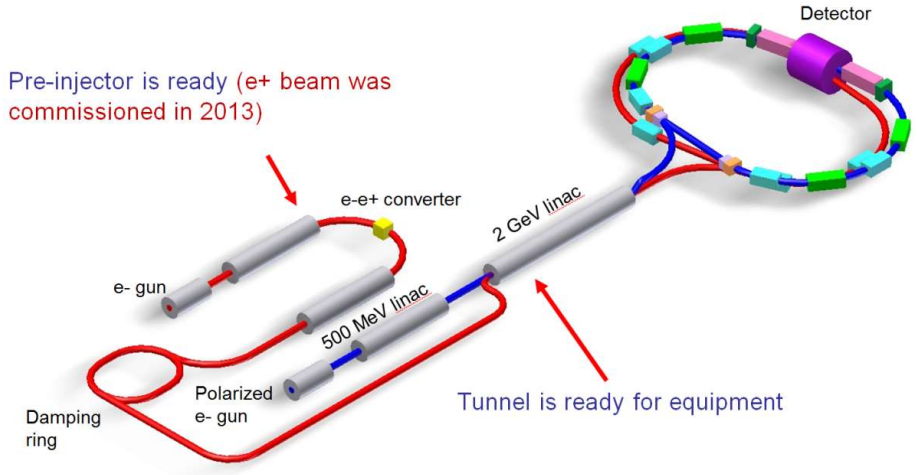
- **Consortium** NRC KI & ESRF (coordinating partners) and DESY, European XFEL; INFN
- **Budget** 4.3 MEUR
- **Objectives**:
  - Development of USSR in three main areas: infrastructure, accelerator, experiments
  - Definition of an initial set of about 10 beamlines covering the main techniques in X-ray imaging, diffraction/scattering, and spectroscopy
  - Setting up two international advisory committees, Machine Advisory Committee (MAC) and Scientific Advisory Committee (USSR-SAC)
  - Develop Conceptual and technical designs CDR and TDR
  - R&D for specific technologies: RF-photogun test facility prototype, electron injection LINAC, beam diagnostics components; detector systems
  - **Initiate closer interaction with ESFRI and dialogue with LEAPS**

The USSR Sketch by NRC KI

LEAPS League of European Accelerator-based Photon Sources

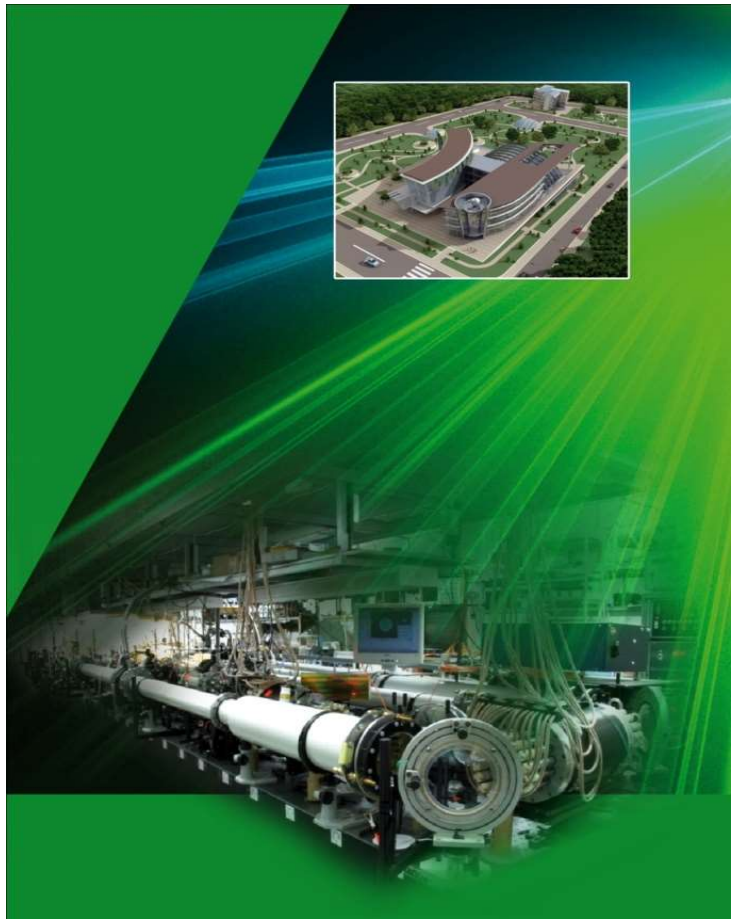
WP5 Joint technology development around SCT and future lepton colliders

- **Consortium** BINP & CERN (coordinating partners); and JLU; CNRS_LAL; INFN
- **Budget** 2.19 MEUR
- **Objectives**:
  - Support and develop EU and Russian scientific cooperation in the SCT project
  - Make an example of good practice on establishing collaboration around Russian RI with extensive participation of EU institutions
  - Support joint EU - Russian efforts on development of future lepton colliders
  - Increase visibility of SCT project in EU and world-wide scientific and decision-makers communities



WP6 Joint technology development around XCELS

- **Consortium** IAP & CEA-LIDYL (coordinating partners); ELI-DC; Laserlab Europe AISBL
- **Budget** 1.45 MEUR
- **Objectives**:
  - Develop the necessary technologies to provide the key technological foundations for the XCELS project
  - Conceptual design of a relativistic plasma mirror well-suited for XCELS
  - Design and development of a prototype of nonlinear compressor of ultraintense laser pulses
  - Develop technologies for ultrashort laser pulse contrast enhancement based on non-linear optical devices
  - Training and scientific exchange on beam delivery, laser pulse contrast issues, metrology and best practices



WP7 Joint development of detector technologies

- **Consortium** FAIR & JINR (coordinating partners); DESY; BINP; NRC KI-PNPI; GUF; CNRS-IPHC; UNIMIB; CERN; ESS; INR NASU
- **Budget** 1.8 MEUR
- **Objectives**:
  - develop beyond state of the art detector technology for the instrumentation of Russian megacience projects NICA and PIK as well as the ESFRI projects ESS and FAIR and other European research infrastructures
  - foster synergy effects in detector technology of thermal and cold neutron beams at ESS and PIK on one side, and nuclear and high energy physics on the other