# EUROPEAN RESEARCH INFRASTRUCTURES IN HORIZON 2020. OPPORTUNITIES FOR RUSSIA

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## RESEARCH INFRASTRUCTURES NCP, MISIS

### St. Petersburg, 07.10.2016

# RESEARCH INFRASTRUCTURES

**include  facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields**

**INCLUDE:**

❖ Major scientific equipment or sets of instruments

❖ Knowledge-based resources such as collections, archives or scientific data

❖ e-infrastructures, such as data and computing systems, and communication networks
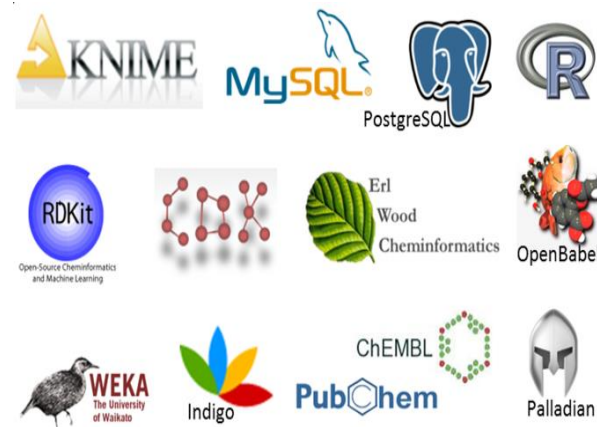
# THE EUROPEAN RESEARCH INFRASTRUCTURE LANDSCAPE

MERIL

MAPPING OF THE EUROPEAN
RESEARCH INFRASTRUCTURE
LANDSCAPE

**594** Research infrastructures
(Pan-European/regional/national) of European importance in different thematic domains

**https://portal.meril.eu/**

MERIL project
under FP7:
2010 - 2012

MERIL-2 project
under Horizon 2020
2016 - 2020

Networks of National Research Infrastructures
http://ec.europa.eu/research/infrastructures/index_
en.cfm?pg=mapri

National RIs

Pan-European Research Infrastructures
http://ec.europa.eu/research/infrastructures/index_
en.cfm?pg=mapri_european

Pan European RIs

# DEVELOPING THE EUROPEAN RESEARCH INFRASTRUCTURES FOR 2020 AND BEYOND

**ESFRI**

**ICRI**

IDENTIFYING NEW RESEARCH INFRASTRUCTURES OR MAJOR UP-GRADES TO EXISTING ONES

EUROPEAN STRATEGIC FORUM ON RESEARCH INFRASTRUCTURES, ESFRI (2002 г.)

I ESFRI ROADMAP (2006), 35 PROJECTS

II ESFRI ROADMAP (2008), III - 2010 48 PROJECTS

IV ESFRI ROADMAP 2016

IMPLEMENTATION OF THREE ROADMAPS FOR 60% BY 2016

# IV ROADMAP: STRUCTURE, APPROACHES, PRINCIPLES



ROADMAP 2016 LAUNCH EVENT
March 10th, 2016 | Amsterdam

**21 ESFRI PROJECTS**
9 (2008); 6 (2010),
6 (new!)

**29 ESFRI LANDMARKS**

**Projects and Landscapes of  ESFRI**
Roadmap 2016 reflect different stages of infrastructures' life cycle

**In focus**: maturity, excellence, sustainability, European value, the need for support

**http://www.esfri.eu/roadmap-2016**

# THEMATIC DOMAINS OF ESFRI ROADMAP 2016



| Energy (ENE) 4 + 1 | Environment (ENV) 5 + 5 | Health& Food (HF) 8 + 6 | Social &Cultural Innovation (SCI) 1+5 | Physical Sciences & Engineering 3 + 11 |
|---|---|---|---|---|

# GLOBAL VALUE OF ESFRI ROADMAP 2016

❖ Some established infrastructures have become or have been conceived from the beginning as globalized undertakings, made affordable and successful with a broad international effort (CERN, Square Kilometer Array (SKA), European Spallation Source ERIC, European XFEL, FAIR, HL-LHC, ILL 20/20, SPIRAL2)

❖ The global impact of the ESFRI RIs has prompted a reflection in two main fora: **the Global Science Forum (GSF, OECD) and** G8+5 группы Group of Senior Officials (GSO), tasked with defining a strategy for Global Research Infrastructures (GRI).

❖ The ESFRI methodology can be applied and implemented at national / global level

# A Coherent Toolbox of Activities

**EU Structural Funds & National Funding**

**Concept** → **Preparation** → **Implementation** → **Operation**

**ESFRI & Other World Class RI (OWCRI)**
**of pan European interest**

Design Study

Preparatory Phase

Support to Implementation & Operation
*Individual projects  -  Clusters*

Integrating Activities

Innovation & Human resources

Policy support actions – International Cooperation
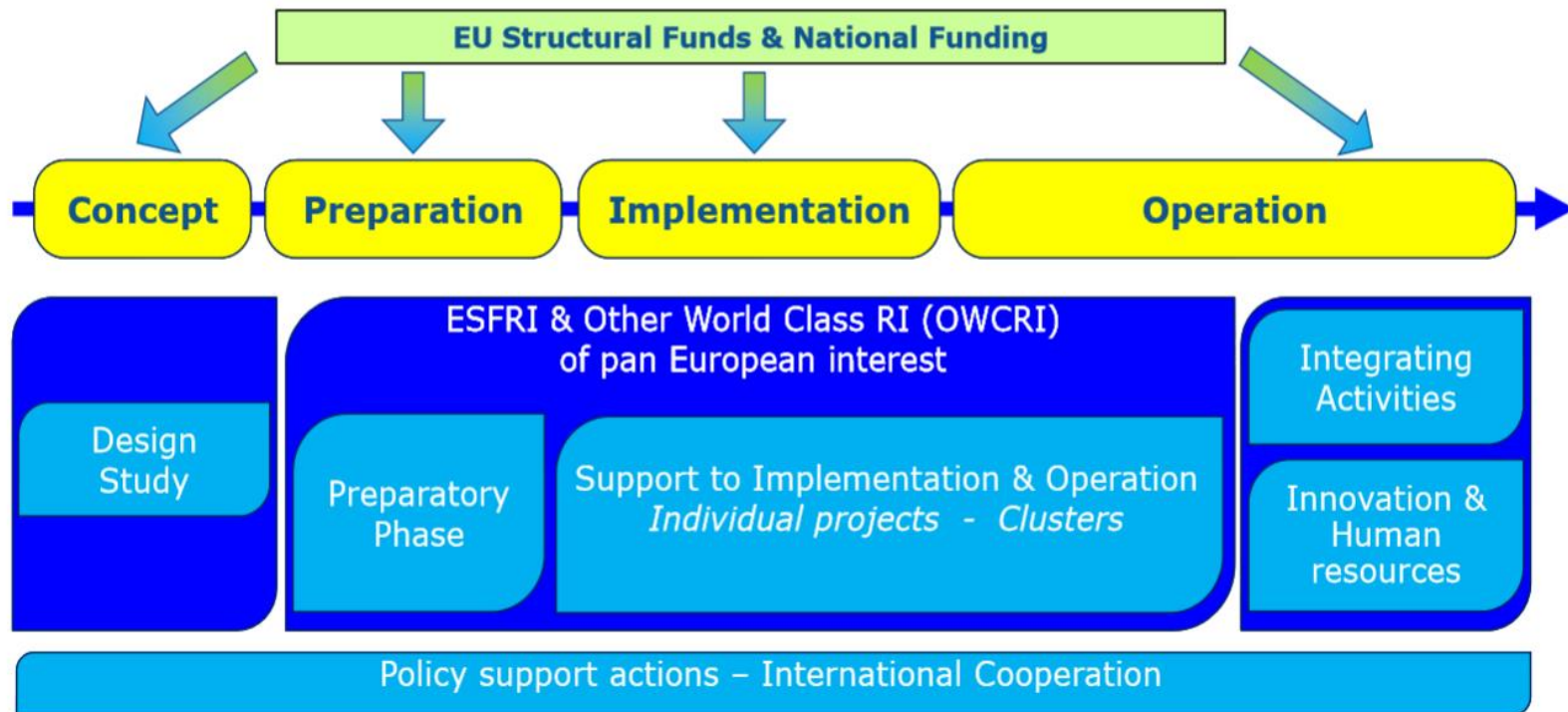
# FINANCIAL INSTRUMENTS SUPPORTING EUROPEAN RESEARCH INFRASTRUCTURES

➢ European programme for Research & Innovation «Horizon 2020»

➢ European Structural & Investment Funds (ESIFs)

➢ European Fund for Strategic Investments (**EFSI**)

➢ European Investment Bank (EIB)

➢ Governments of EU Member States (Germany, France, United Kingdom, Italy)

➢ International partners in the Global Research Infrastructures (**BRICS**, USA, Canada)

HORIZON 2020

**Pillar 1. Excellent Science**

➢ European Research Council, ERC

➢ Future & Emerging Technologies, FET

➢ Marie Sklodowska Curie Actions, MSCA

➢ **RESEARCH INFRASTRUCTURES (including e-infrastructure), RIs ~ € 2.4 billion**

European Investment Bank    *The EU bank*

European Research Area    An open space for knowledge and growth

# RESEARCH INFRASTUCTURES IN HORIZON 2020



https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe

I. **Developing the European RIs for 2020 and beyond:**

➢ Developing new world-class RIs
➢ Integrating and opening national and regional RIs of European interest
➢ Development, deployment and operation of ICT based **e-Infrastructures**

II. **Fostering the innovation potential of RIs and their human resources**

III. **Reinforcing European RI policy and international cooperation**

# RESEARCH INFRASTRUCTURES WORK PROGRAMME 2014-2015, 4 CALLS, 22 TOPICS. OUTCOME

**CALL 1: DEVELOPING NEW WORLD-CLASS RIs INFRADEV-1-2014**

**CALL 2: INTEGRATING AND OPENING RIs OF EUROPEAN INTEREST H2020-INFRAIA-2014-2015**

**CALL 3: E-INFRASTRUCTURES**

**CALL 4: SUPPORT TO INNOVATION, HUMAN RESOURCES, POLICY AND INCO FOR RIs H2020-INFRASUPP-2014-2015**

## 102 SUPORTED PROJECTS IN CORDIS DATA BASE

http://cordis.europa.eu/projects/home_en.html





**CREMLIN** shall improve and strengthen the relations and networks between European and Russian research infrastructures both at a scientific level and at a research policy level
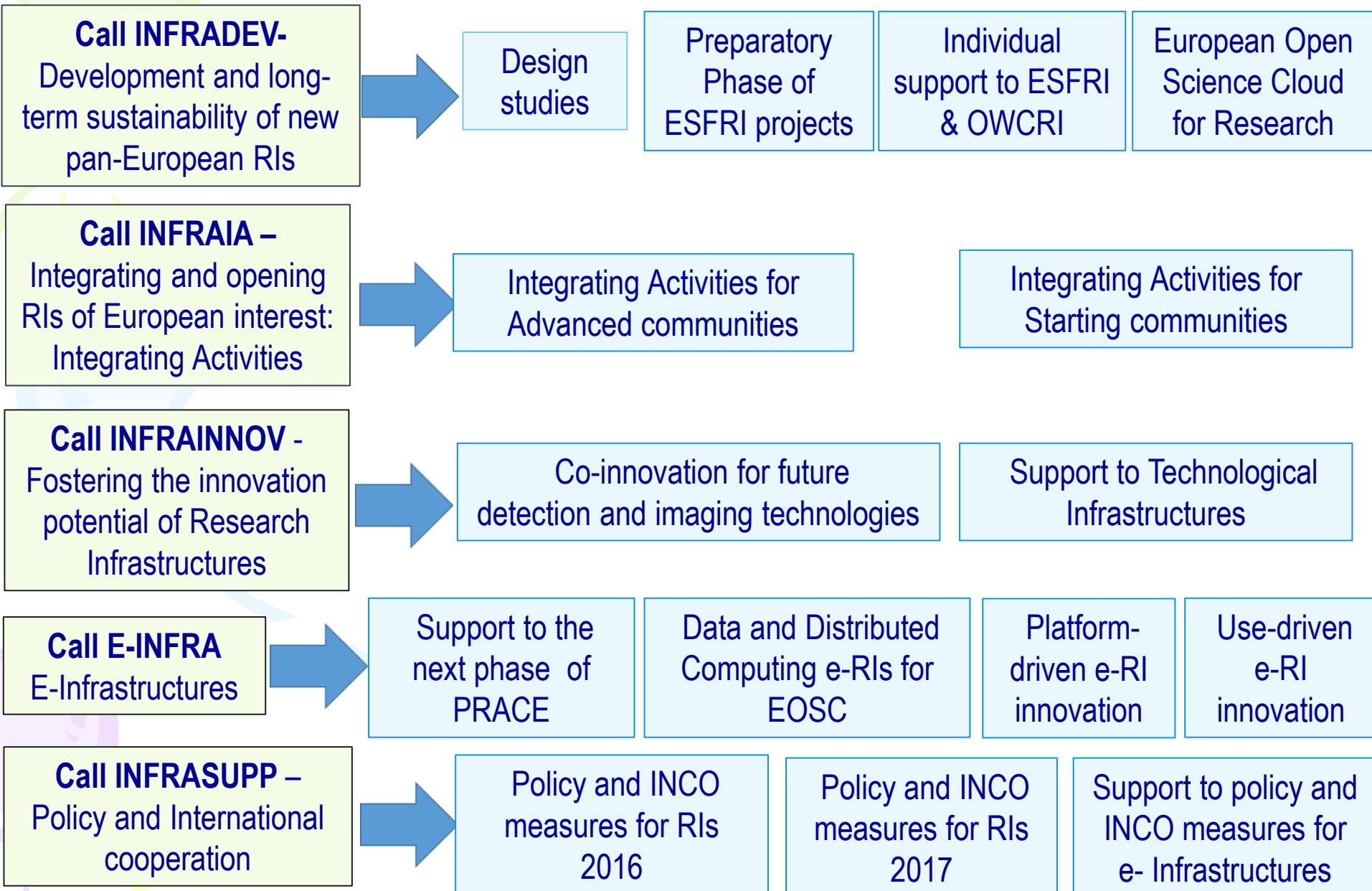http://cremlin.eu



Ocean Data Interoperability Platform

http://www.odip.org/



European virus archive goes global
http://www.european-virus-archive.com/ evag-project

# RESEARCH INFRASTRUCTURES. WORK PROGRAMME 2016-2017
# 5 CALLS – 15 TOPICS

**Call INFRADEV-** Development and long-term sustainability of new pan-European RIs

→ Design studies | Preparatory Phase of ESFRI projects | Individual support to ESFRI & OWCRI | European Open Science Cloud for Research

**Call INFRAIA –** Integrating and opening RIs of European interest: Integrating Activities

→ Integrating Activities for Advanced communities | Integrating Activities for Starting communities

**Call INFRAINNOV -** Fostering the innovation potential of Research Infrastructures

→ Co-innovation for future detection and imaging technologies | Support to Technological Infrastructures

**Call E-INFRA** E-Infrastructures

→ Support to the next phase of PRACE | Data and Distributed Computing e-RIs for EOSC | Platform-driven e-RI innovation | Use-driven e-RI innovation

**Call INFRASUPP –** Policy and International cooperation

→ Policy and INCO measures for RIs 2016 | Policy and INCO measures for RIs 2017 | Support to policy and INCO measures for e- Infrastructures

# FORTHCOMING CALLS UNDER HORIZON 2020 (I)

**I. Call: Design Studies**

Topic identifier**:** INFRADEV-01-2017

Types of action**:** RIA Research and Innovation action

Opening date**: 08.12.2016**     Deadline: **29.03.2017** 17:00:00

Model: **single-stage**

**II**. Call: Fostering co-innovation for future detection and imaging technologies

Topic identifier: INFRAINNOV-01-2017

Opening date: **08.12.2016**     Deadline: **29.03.2017** 17:00:0

Types of action: RIA Research and Innovation action

Model: **single-stage**


**III**. Topic:  Policy and international cooperation measures for research infrastructures
Topic identifier**: INFRASUPP-02-2017:**

Opening date: **08.12.2016**   Deadline: **29.03.2017** 17:00:00

Types of action: CSA Coordination and support action

Model: single-stage

# FORTHCOMING CALLS UNDER HORIZON 2020 (II)

**I. Topic: Data and Distributed Computing e-infrastructures for Open Science**

Topic identifier**: EINFRA-12-2017**

Opening date: **08.12.2016,**  Deadline: **29.03.2017 17:00:0**

Types of action: RIA Research and Innovation action

   Model: single-stage


**II. Topic**:  **Platform-driven e-infrastructure innovation**

Topic identifier: **EINFRA-21-2017**

Opening date: **08.12.2016**    Deadline: **29.03.2017 17:00:00**

Types of action: RIA Research and Innovation action

   Model:  single-stage

# ACCESS TO RESEARCH INFRASTRUCTURES UNDER HORIZON 2020

## TRANS-NATIONAL ACCESS (TA)

## VIRTUAL ACCESS (VA)

free of charge' provision of access to a RI to selected researchers or research teams usually working in a country other than the country where the RI is located

Free of charge' provision of access to widely used resources needed for research that are openly and freely available through communication networks

in person ('hands-on'), to users visiting RI (e.g. access to a research vessel)

remote scientific services, no visit needed (performance of sample analysis)

**Only specific requirements** such as registration, authentication and/or authorisation of users (e.g. for access to sensitive data)

**No need** for a competitive selection of users, to identify users, to visit the infrastructure to get access

**Third country users: up to 20% of the access can be provided to user teams with a majority of users working in third countries**

Information about TA call in the web site: **http://www.rich2020.eu/tas_calls**

**RICH**
Research Infrastructures Consortium for Horizon 2020

# Open Innovation, Open Science, Open to the World - a vision for Europe ("Three Os")



Open Science represents a new approach to the scientific process, based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools.

With the adoption of the Digital Single Markets strategy on 6 May 2015, the Commission announced the launch of a cloud for research data – the 'research open science cloud'. The 'European Open Science Cloud, EOSC' aims to create a trusted environment for hosting and processing research data to support EU science in its global leading role.

Web site:
http://ec.europa.eu/research/openscience/index.cfm

# ELIXIR - A DISTRIBUTED INFRASTRUCTURE FOR LIFE-SCIENCE INFORMATION

**ELIXIR Conference Open Data in Action:**
Life Science Data Infrastructure for Innovation
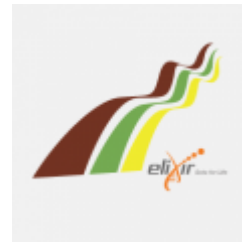04.02.2016, Brussels, Belgium

**GOBLET: Global Organization for Bioinformatics Learning, Education and Training**
http://www.mygoblet.org/training-portal

http://www.eurobioimaging.eu/

**https://www.elixir-europe.org/**
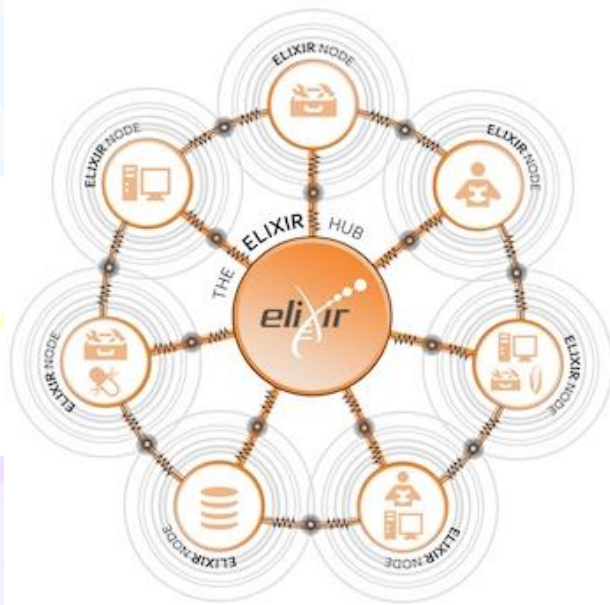
**The Research Data Alliance (RDA, 20213)** is a global forum to enable open sharing of scientific data across disciplines, technologies and countries. https://rd-alliance.org/

# ERIC- EUROPEAN CONSORTIUM FOR RESEARCH INFRASTRUCTURES

ERIC is a **legal instrument** at EU level, to facilitate the joint establishment and operation of Research Infrastructures of European interest in different thematic domains

ERIC can be used for establishing new research infrastructures or for operating existing research infrastructures when members consider it useful to change their legal structures to become an ERIC.

✓ Main members of ERIC are 3 organizations from 3 different EU Member or Associated States, but ERIC is **open to organizations from third countries** (membership fee in different forms)

✓ Clear rules and procedures of the consortium

✓ A lighter process than creating a treaty based international organization

**https://ec.europa.eu/research/infrastructures/index_en.cfm?pg=eric**
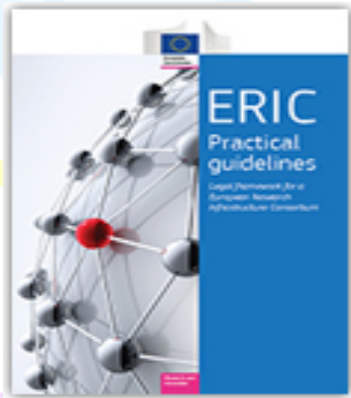
**ERIC PRACTICAL GUIDELINES 2015**

# HORIZON 2020. EUROPEAN APPROACH TO COLLABORATION WITH RUSSIA

❖ Support multi-lateral cooperation on research infrastructures with Russia in one or several of the following areas: Arctic research, marine science, biodiversity, food research and medicine

❖ Develop cooperation between European research infrastructures and **the Russian Mega Science** facilities, including the underpinning e-infrastructure:

**The projects FAIR and NICA were included to the ESFRI Roadmap 2016**





**N**uclotron - based **I**on **C**ollider facility

**http://nica.jinr.ru/**

**http://www.fair-center.eu/**

# INTERNATIONAL MEGA SCIENCE PROJECTS WITH THE RUSSIAN PARTICIPATION

**European XFEL**
(http://www.xfel.eu/en/)

**The Large Hadron Collider**
(http://public.web.cern.ch/public/en/LHC/LHC-en.html)

International thermonuclear experimental reactor (ITER)
http://www.iter.org

ITER's member states:
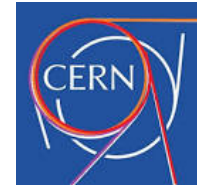the EU (is contributing 45 %), India, Russia (9%), China, South Korea, Japan, United States

XFEL Member States: Denmark, France, Germany, Greece, Hungary, Italy, Poland, Russia, Slovakia, Spain, Sweden and Switzerland.
Costs amount 1082 million Euro: 54% Germany, 23% Russia, the other international partners between 1 and 3.5%

A large volume detector for low energy neutrino spectroscopy Borexino Partners: Italy, Germany, France, Russia, USA, Poland, Ukraine

http://www.fair-center.de

http://www.esrf.eu/

# EU-RUSSIA S&T COOPERATION IN RIs UNDER HORIZON 2020

From the list of calls in the Horizon 2020 WP 2016 -2017 the Ministry of Education and Science of Russia highlight the following subjects of priority interest for the Russian Federation in the area of Research Infrastructures:

**CALL: SUPPORT TO POLICY AND INTERNATIONAL COOPERATION**

➢ INFRASUPP-01-2016: Policy and international cooperation measures for research infrastructures

➢ INFRASUPP-02-2017: Policy and international cooperation measures for research infrastructures

**Joint calls with ESRF under FTP 2014-2020 in 2015**

**The results:** I CALL: 16 proposals, 11 of them have been successful

II CALL: 33 proposals, 13 of them have been successful

**Web-site: f**ttp://fcpir.ru/participation_in_program/contests/list_of_contests/

**Applying for beam time is possible via web-site ESRF on regular basis :**

**http://www.esrf.eu/UsersAndScience/UserGuide/Applying**

# RESEARCH INFRASTRUCTURES. WHAT'S THE NEXT

❖ European Commission has started preparations of the **new H2020 Work Programme 2018-2020**  with a set of consultations with stakeholders in different thematic areas.

The first draft will be ready by May 2017, the new calls are scheduled in  Autumn 2017

**https://ec.europa.eu/programmes/horizon2020/en/what-work-programme**

The preparation of the Research Infrastructures (including e-Infrastructures) part of the WP 2018-2020 started at the beginning of 2016 and is currently ongoing. Main inputs will be gathered, in particular from the Research Infrastructures Advisory Group and from

consultation with major stakeholders (e.g. ESFRI, e-IRG, EIROFORUM, ERICs, representatives from Member States and Associated countries).

❖ **FP9: Towards the next Framework Programme for R&I**

FP9 most likely will cover the period 2021 – 2027, it is due to start on 1 January 2021.

Discussions and preparations for the next (9th) FP have already begun.

A High level group will work on the "Future Orientations" of the FP until summer 2017,

EC is starting consultations with stakeholders in autumn 2017

**The first version well be ready by the end of 2017 – beginning of 2018**

# Group of Senior Officials on Global RIs(GSO). Pilot projects

| | | | | | |
|---|---|---|---|---|---|
| LNGS | Italy | Russian Federation | | Joint Institute for Nuclear Research, Dubna, Russia | Bednyakov Vadim, director Laboratory of Nuclear Problem of JINR, e-mail: bedny@jinr.ru, Tel.: +7 49621 65263 (office), Mobile: +7 916 1587525 |
| LNLS | Brazil | Russian Federation | Studying the features of electronic and crystal structures of complex oxides, multiferroics, high-temperature superconductors, strong magnetic compounds, systems with strong electron correlations using synchrotron radiation. Further development of XAFS- spectroscopy, anomalous x-ray diffraction, resonant inelastic X-ray scattering (RIXS), the x-ray magnetic circular dichroism. | National Research Nuclear University "MEPhI": The research group is working with original software for processing EXAFS spectra. Similar research has been conducted in cooperation with the following synchrotron centers: LURE (Orsay, France), DESY (Hamburg, Germany), MAX–lab (Lund, Sweden), BESSY-II (Berlin, Germany), SOLEIL (France), Kurchatov source of synchrotron radiation (Moscow, Russia). | |
| LNNANO | Brazil | Russian Federation | Characterizing advanced materials, participating in the compiling of «Big Data», virtual databases. | The National University of Science and Technology "MISIS": MISIS has performed significant groundwork in the area of nanotechnological research. The university set up a scientific and educational center "Nanomaterials and Nanotechnologies" and research centers: "Structural Ceramic Nanomaterials", "Inorganic Nanomaterials", "Hybrid Nanostructured Materials". | |
| MMC IMPC | Italy | Russian Federation | Implementation of joint research programs. | Department of Medical Sciences of the Russian Academy of Sciences: Federal Research Center Institute Cytology and Genetics SB RAS  The department has performed significant scientific groundwork in a broad spectrum of research in the field of medicine | Mikhail Moshkin Professor and Head Department of Genetic Resources of laboratory Animals Cell:8-923-241-0578 mmp@bionet.nsc.ru |
| MMC IMPC | Italy | Russian Federation | Exchanging lines of mice and information on the conducted research. Conducting joint research. | Central Research Institute of Tuberculosis The institute set up a registered at the US National Institute of Health mouse farm (registration number of the work permit A5502). International Index of the farm: Cit. The researchers conduct studies of experimental models of tuberculosis in mice. | Alexander Apt Professor and Head Laboratory for Immunogenetics Tel:8-499-785-90-72 Fax: 8-499-785-91-08 cniit@ramn.ru |

| | |
|---|---|
| **IMPC** **Italy** | **International Mouse Phenotyping Consortium,** http://www.mousephenotype.org/ |
| **CHARS** **Canada** | **Canadian High Arctic Research Station** http://www.science.gc.ca/default.asp?lang=En&n=74E65368-1 |

| | |
|---|---|
| **LNGS** **Italy** | **Laboratori Nazionali del Gran Sasso** https://www.lngs.infn.it/en |
| **LNLS** **Brazil** | **Synchrotron Light Laboratory** http://cnpem.br |
| **LNNANO** **Brazil** | **Nanotechnology National Laboratory** http://lnnano.cnpem.br |

# NCP FOR EUROPEAN RESEARCH INFRASTRUCTURES IN RUSSIA
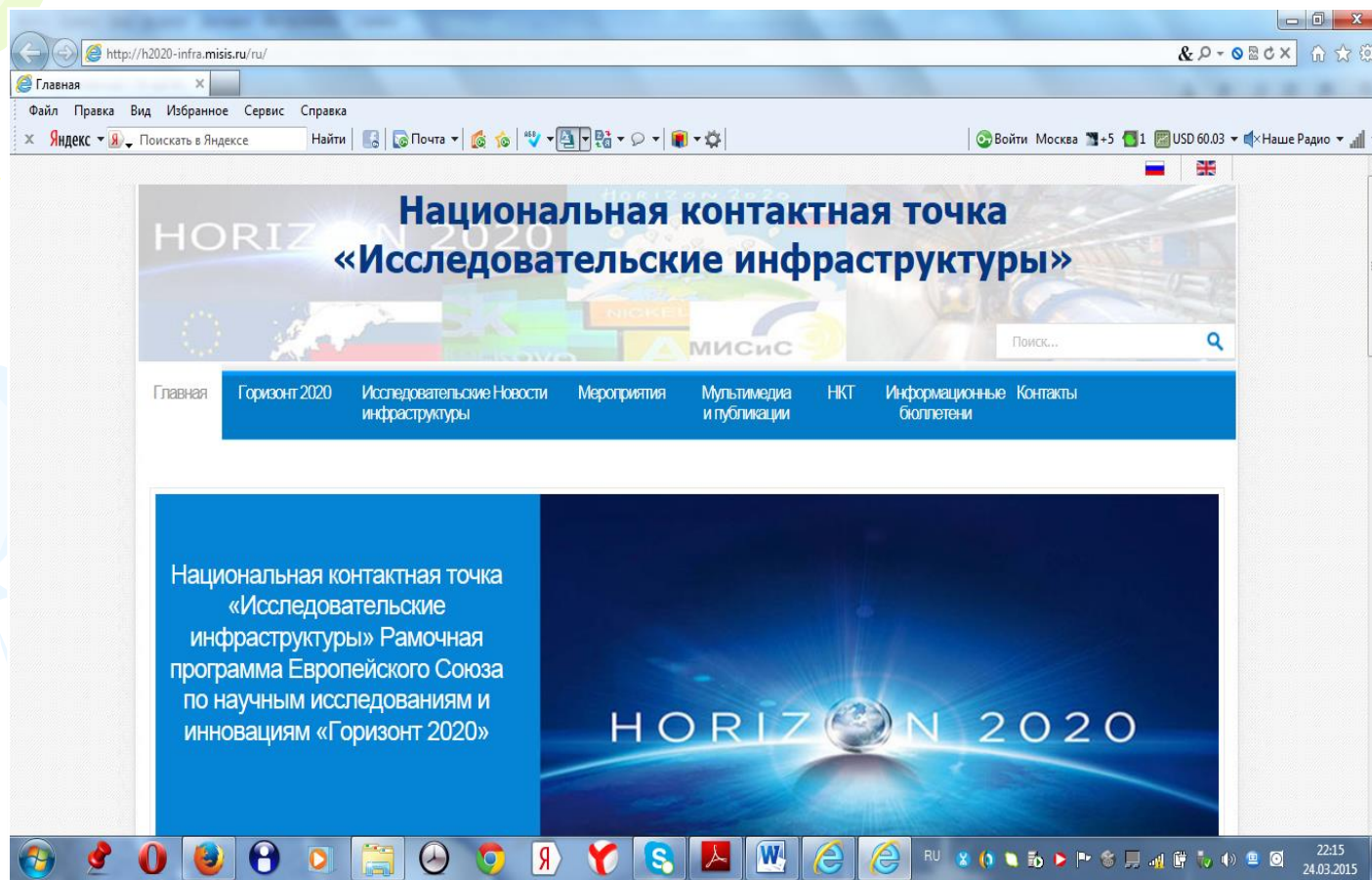


**"RICH" - Research Infrastructures Consortium for Horizon 2020**
Agreement № 646713 of 01.12. 2014.
Coordinator:  Agency of promotion of European Research APRE, Italy.
Russian participant: MISIS

# *THANK YOU FOR YOUR ATTENTION*



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