



MINISTRY OF EDUCATION,
YOUTH AND SPORTS

Research Infrastructures of the Czech Republic in the context of ESFRI

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1. Roadmap of the Czech Republic of Large Infrastructures for Research, Experimental Development and Innovation

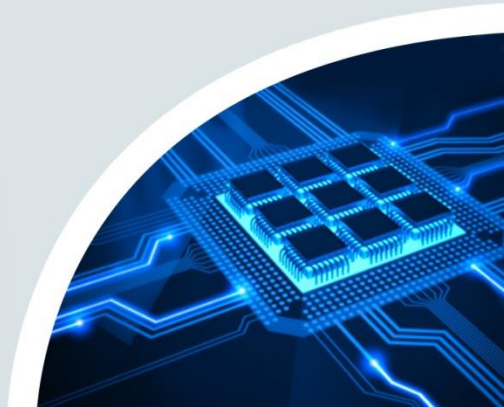
- **General compliance with ESFRI Roadmap**
- **Strategy and policy document** of the Czech Republic prepared by the **Ministry of Education, Youth and Sports** and approved by the **Government of the Czech Republic**
- For the 1st time issued in 2010, updated in 2011, **to be updated in 2015** and after that in the same general timeframe as the ESFRI Roadmap
- Landscape analysis, evaluation mechanisms, gap analysis and strategic outlook, overview of large infrastructures for RDI
- **6 Science-oriented areas**
 - Social Sciences and Humanities
 - Environmental Sciences
 - Physical Sciences
 - Energy
 - Biomedicine
 - Informatics / e-Infrastructures





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- The **definition** of a Large Infrastructure for Research, Experimental Development and Innovation is stipulated by the **Act No. 130/2002 Coll. on Support of Research, Experimental Development and Innovation** from Public Funds and on Amendments to Some Related Acts
- **“Large Infrastructure for Research, Experimental Development and Innovation“** = a unique research facility, including its acquisition and related investment costs and the costs of ensuring its activities that are essential for comprehensive research and development with heavy financial and technological demands and which is approved by the Government of the Czech Republic and established by one research organisation for the use of other research organisations
- Common characteristics criteria
 - **Uniqueness**
 - **Nation-wide impact**
 - **International overlap**
 - **Open access to facilities**
 - **Excellence**



- **Uniqueness**

- Large infrastructure for RDI represents exceptional, extraordinary and unique facility and capacity for performing research, technological development and innovation in a scientific field or multidisciplinary area

- **Nation-wide impact**

- Large infrastructure for RDI has at least nation-wide importance and significance within the research and innovation ecosystem

- **International overlap**

- Large infrastructure for RDI is inter-linked with other research infrastructures within macro-regional, pan-European or global networks and has significant international overlap and impact

- **Open access to facilities**

- Large infrastructure for RDI is operated by a research organisation for the use of other entities from RDI community and provides external users with services on the basis of tenders evaluated by experts

- **Excellence**

- results reached by using large infrastructure for RDI are high-quality and highly relevant from the “value for money” point of view





a) **Large Infrastructures for RDI located in the Czech Republic having an significant international impact and overlap**

- **CEITEC Nanotechnologies**
- **CESNET** – Czech Education and Scientific Network
- **COMPASS Tokamak**
- **ELI Beamlines** – Extreme Light Infrastructure
- **IT4Innovations** – National Supercomputing Centre
- **Research Reactors** LVR-15 and LR-0
- **RECETOX** – Research Centre for Environmental Chemistry and Eco-toxicology

b) **Large Infrastructures for RDI of the Czech Republic in abroad**

- **Polar Antarctic Station** of Johann Gregor Mendel on James Ross Island
- **Polar Arctic station** on Svalbard





c) **Large Infrastructures for RDI as Czech national “nodes” of pan-European distributed research infrastructures**

- **CESSDA** – Consortium of European Social Science Data Archives
- **EU – OPENSREEN** – European Infrastructure of Open Screening Platforms for Chemical Biology
- **INFRAFRONTIER** – European Infrastructure for Phenotyping and Archiving of Model Mammalian Genomes
- **PRACE** – Partnership For Advanced Computing in Europe
- **SHARE** – Survey of Health, Ageing and Retirement in Europe

d) **Large Infrastructures for RDI in the form of Czech involvement in international single-sited research infrastructures or an access point to its facilities**

- **CERN** – European Organization for Nuclear Research
- **Fermilab** – Fermi National Accelerator Laboratory
- **ESS** – European Spallation Source
- **JHR** – Jules Horowitz Reactor
- **Pierre Auger Observatory**



2. International Evaluation of Czech Research Infrastructures in ESFRI context

- **New methodology for research infrastructures evaluation prepared in 2013 – 2014 in line with ESFRI standards**
- **International Evaluation Committee chaired by Dr. Peter Fletcher** (UK Science and Technology Facilities Council) and composed of 6 Scientific Boards formed by leading foreign experts on research infrastructures, including ESFRI Member States delegates
- **The most up-to-date overview of Czech research infrastructures** regardless of their current life cycle phase (i.e. preparatory, implementation, operational, phase-out) after intervention of ERDF in the Czech Republic
- An expert basis for political **decision-making on funding the large infrastructures for RDI** during the forthcoming multiannual financial framework **2016 – 2022**
- An expert basis for political **decision-making on supporting research infrastructures applying for ESFRI Roadmap update**
- An expert basis for **updating the Roadmap of the Czech Republic of Large Infrastructures for Research, Experimental Development and Innovation**

3. Czech Research Infrastructures in ERA and Global Research Infrastructures Networks

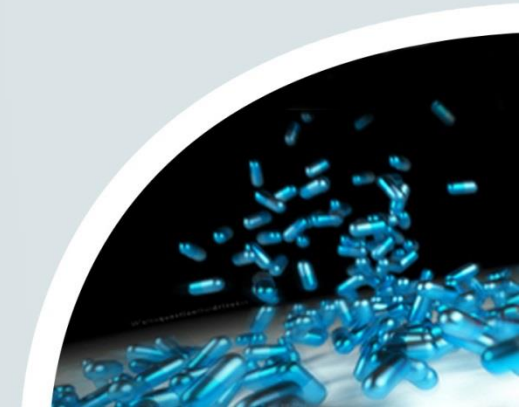
- **Membership in European Research Infrastructures Consortia (ERIC)**
 - **BBMRI** – Bio-banking and Bio-molecular Resources Research Infrastructure
 - **CERIC** – Central European Research Infrastructure Consortium
 - **CLARIN** – Common Language Resources and Technology Infrastructure
 - **EATRIS** – European Infrastructure for Transitional Medicine
 - **ESS Survey** – European Social Survey
 - **SHARE** – Survey of Health, Ageing and Retirement in Europe





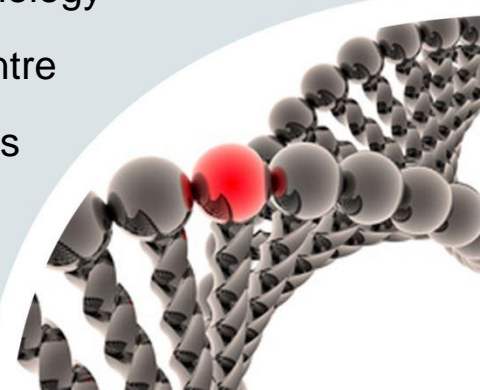
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- **Membership in International Research Organisations**
 - **CERN** – European Organization for Nuclear Research
 - **JINR** – Joint Institute of Nuclear Research
 - **ESA** – European Space Agency
 - **ESO** – European Southern Observatory (including E-ELT)
 - **EMBC** – European Molecular Biology Conference
 - **EMBL** – European Molecular Biology Laboratory (including ELIXIR)
 - **VKIFD** – Von Karman Institute for Fluid Dynamics



4. Investments in Czech Research Infrastructures from European Regional and Development Funds

- **European Regional and Development Funds** → Operational Programme “Research and Development for Innovation” managed by the Ministry of Education, Youth and Sports in 2007 – 2015
- **“European Centres of Excellence“** (Priority Axis 1)
 - Most up-to-date equipped centres with modern and even unique research infrastructure with a critical size and able to contribute to networking of leading Czech research teams with leading international research organisations and infrastructures (e.g.)
 - **BIOCEV** – Biotechnology and Biomedicine Centre in Vestec
 - **ELI Beamlines** – 1st pillar of Extreme Light Infrastructure
 - **CEITEC** – Central European Institute of Technology
 - **Czech Globe** – Global Change Research Centre
 - **IT4I** – Information Technologies for Innovations





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- **“Regional Centres for Research and Development“** (Priority Axis 2)
 - Centres with the most up-to-date equipment focused primarily on applied research and technological development with possible nation-wide and international impact (e.g.)
 - **BIOMEDREG** – Biomedicine for Regional Development and Human Resources
 - **CETOCOEN** – Research Centre for Toxic Compounds in Environment
 - **CVVOZE** – Centre for Research and Utilization of Renewable Energy
 - **HiLASE** – New Lasers for Industry and Research
 - **SUSEN** – Sustainable Energy



5. ELI Beamlines – an example of Czech Research Infrastructure on ESFRI Roadmap

- **ELI = Extreme Light Infrastructure**
 - **ELI Beamlines (Dolní Břežany near Prague, Czech Republic)**
 - ELI Attosecond (Szeged, Hungary)
 - ELI Nuclear Physics (Măgurele, Romania)
 - ELI Ultra-High Intensity (site to be determined)
 - 1st ESFRI Roadmap project predominantly funded by ERDF
- **Institute of Physics, Academy of Sciences of the Czech Republic**
 - Investments 6.8 billion CZK ≈ 250 mil. EUR
- **Lawrence Livermore National Laboratory**
 - A contract worth 34.5 mil. EUR to develop and deliver state-of-the-art laser system
→ High Repetition-Rate Advanced Petawatt Laser System (HAPLS)



- **ELI Beamlines Research Programmes**

- Lasers
- X-ray Sources Driven by Ultra-short Laser Pulses
- Particle Acceleration by Lasers
- Applications in Molecular, Biomedical and Material Sciences
- Plasma and High Energy Density Physics
- Exotic Physics and Theory

- **ELI Delivery Consortium International Association**

- AISBL – Association Internationale Sans But Lucratif (Brussels)
- 6 Member States already – **CZ, HU, RO, DE, IT, UK**
- **UK** – Science & Technology Facilities Council
- **DE** – Deutsches Elektronen-Synchrotron
- **IT** – Elettra – Sincrotrone Trieste
- **ELI – ERIC to be established in 2018**





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ELI Beamlines

1st pillar of Extreme Light Infrastructure

Dolní Břežany near Prague

Institute of Physics

Academy of Sciences of the Czech Republic

250 mil. EUR



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Thank you for your attention!

Prof. Ivan Wilhelm

***Special Envoy of the Government of the Czech Republic
for European Research***

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