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nanoschematic

nanoschematic is a software tool for the visualization of nanoscale structures. It is designed to be used by researchers in the field of nanotechnology. The software allows users to create 3D models of various nanoscale structures, including nanoparticles, nanowires, nanotubes, and nanosheets. These models can then be rendered in a variety of formats, including high-resolution images and interactive 3D visualizations. The software also includes a number of features designed to facilitate the analysis and comparison of different nanoscale structures, such as the ability to measure the size and shape of individual structures, and to calculate the surface area and volume of complex structures. Overall, nanoschematic is a powerful tool for researchers in the field of nanotechnology, providing a clear and intuitive way to visualize and analyze nanoscale structures.

International Evaluation of Large Research Infrastructures of the Czech Republic in 2017

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Contents

- 1. General typology of research infrastructures**
- 2. Large research infrastructures – funding scheme**
- 3. Roadmap of large research infrastructures
of the Czech Republic for the years 2016-2022**
- 4. Evaluation of large research infrastructures 2017**
- 5. Current state-of-play and next steps**



1. General typology of research infrastructures

- Research infrastructures are established and operated under various nationally and internationally based legal frameworks, nevertheless with the same goal to serve the user community
 - **International R&D organisations**
 - CERN (European Organisation for Nuclear Research)
 - EMBC (European Molecular Biology Conference)
 - EMBL (European Molecular Biology Laboratory)
 - ESA (European Space Agency)
 - ESO (European Southern Observatory)
 - JINR (Joint Institute of Nuclear Research)



● **European Research Infrastructure Consortium (ERIC)**

- BBMRI (Biobanking & Biomolecular Resources Research Infrastructure)
- CERIC (Central European Research Infrastructure Consortium)
- CLARIN (Common Language Resources & Technology Infrastructure)
- EATRIS (European Infrastructure for Translational Medicine)
- ESS (European Spallation Source)
- ESS Survey (European Social Survey)
- ICOS (Integrated Carbon Observation System)
- SHARE (Survey of Health, Ageing and Retirement in Europe)



- **European Research Infrastructure Consortium (ERIC)**

- CESSDA (Consortium of European Social Science Data Archives)
- EU-OPENSOURCE (European Infrastructure of Open Screening Platforms for Chemical Biology)
- INSTRUCT (European Integrated Structural Biology Infrastructure)

- **Host country national legal frameworks**

- AIBSL (Association Internationale Sans but Lucratif)
- GmbH (Gesellschaft mit beschränkter Haftung)
- Higher education institution
- Public research institution



2. Large research infrastructures – funding scheme

- Legal definition of the so-called “**large research infrastructure**” is stipulated by the national legislation on the support of research, development and innovation from public funds of the Czech Republic
 - *“A research infrastructure, which is a research facility 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 of large research infrastructures
 - **Uniqueness**
 - **Open access**
 - **Excellence**
 - **National impact**
 - **International overlap**



→ **Service facility!**



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● Uniqueness

- Large research infrastructure represents an exceptional and unique facility gathering critical mass of technological devices and knowledge expertise necessary for performing world-class research, technology development and innovation

● Open access

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

● Excellence

- R&D results reached by using the large research infrastructure respond to socio-economic challenges and are of high-quality and highly relevant from the “value for money” point of view

● National impact

- Large research infrastructure has at least national importance, significance and impact within the Czech Republic

● International overlap

- Large research infrastructure is inter-linked with other research infrastructures within macro-regional, pan-European or global networks having significant international impact



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- **Requirements for funding** of a large research infrastructure
 - Compliance with **general qualitative criteria** stipulated by the national legislation of the Czech Republic on support of research, development and innovation from public funds
 - Positive outcome of an **international peer-review evaluation** organised by the Ministry of Education, Youth and Sports (being responsible for large research infrastructures policy and funding)
 - Recommendation for funding issued by **Research, Development and Innovation Council** (advisory board to the Government of the Czech Republic)
 - Adoption of funding proposed by the Minister of Education, Youth and Sports on the **Government of the Czech Republic** session

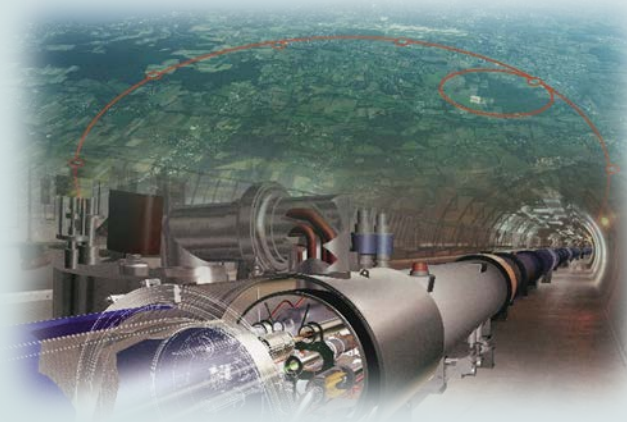




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- **Once approved by the Government of the Czech Republic**

- Inclusion of the respective large research infrastructure in the **Roadmap of Large Research Infrastructures** of the Czech Republic for the years 2016-2022
- Funding of **operation costs** of the respective large research infrastructure by using the state budget expenditures on R&D
 - Personal costs – costs of management, researchers and technicians operating the large research infrastructure
 - Operation costs – materials, energy, services (subcontracts), international mobility, overheads (flat rate / full-cost), etc.
 - Membership fees – participation in international research infrastructures networks and legal frameworks (ERIC, etc.)





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- **Once approved by the Government of the Czech Republic**
 - Eligibility for particular call of the Operational Programme Research, Development and Education for covering **investment costs** of large research infrastructures of the Czech Republic
 - Complementary use of state budget expenditures of the Czech Republic on R&D and European Structural and Investment Funds
 - Mandate for the Minister of Education, Youth and Sports to enter – on behalf of the Czech Republic – **international legal framework** (e.g. ERIC) that a large research infrastructure is coordinated within





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3. Roadmap of large research infrastructures of the Czech Republic for the years 2016-2022

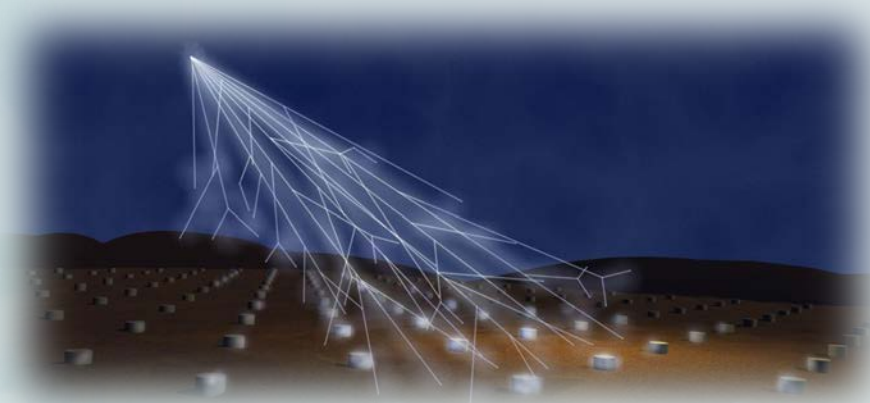
- Strategy and policy document of the Czech Republic prepared by the **Ministry of Education, Youth and Sports** and adopted by the **Government of the Czech Republic**
- For the very first time issued in 2010, for the last time updated in 2015, **next update planned for 2018** following comprehensive international evaluation of large research infrastructures in 2017
- Genesis of agenda, evaluation mechanisms, strategy outlook, landscape analysis, overview of large research infrastructures within 6 scientific areas
 - **Physical sciences and engineering**
 - **Energy**
 - **Environmental sciences**
 - **Biomedicine / Health and food**
 - **Social sciences and humanities**
 - **ICT / e-infrastructures**

www.esfri.eu/national-roadmaps



4. Evaluation of large research infrastructures 2017

- Expert basis for policy-decision making process on **funding of already supported large research infrastructures in 2020-2022**, both by the state budget expenditures (operation) and ESIF (investments)
- Expert basis for policy-decision making process on **funding of new large research infrastructures' projects in 2019/2020-2022**, both by the state budget expenditures (operation) and ESIF (investments)
- Expert basis for policy-decision making process on supporting the pan-European research infrastructures with the Czech participation applying for the **2018 ESFRI Roadmap update**
- Expert basis for the **2018 update of the Roadmap of Large Research Infrastructures of the Czech Republic** for the years 2016-2022



● Large research infrastructures evaluation procedure

- Methodology was prepared and international evaluation committee appointed in close cooperation with **Large Research Infrastructures Council** (advisory board to Minister of Education, Youth and Sports)
- Methodology was inspired by rigorous ESFRI evaluation standards and based on **international peer-review** assessment principles
- International evaluation committee was composed of the **Chair** and **6 Scientific Boards per 5 Members** formed by internationally reputable experts on research infrastructures (including 1 Member from the Czech Republic)
- Two in-person meetings of Scientific Boards in Prague, coordination video-conference meeting of Scientific Boards' Chairs and the overall Chair, external inputs delivered by another 3 reviewers, interview with large research infrastructures → **comprehensive assessment**



● Large research infrastructures evaluation criteria

- Organisation and management structure
- Knowledge and technology expertise provided
- Technology and human resources development plans
- Cooperation at national / international level with public / private sector
- Importance / contribution for development of respective R&D area
- Compliance with needs of user community and scientific trends
- Open access policy / arrangements and capacity use
- Scientific results achieved by users
- Feasibility / SWOT analysis
- Benchmarking
- Communication / marketing
- Costs and budget
- Performance indicators
- Milestones



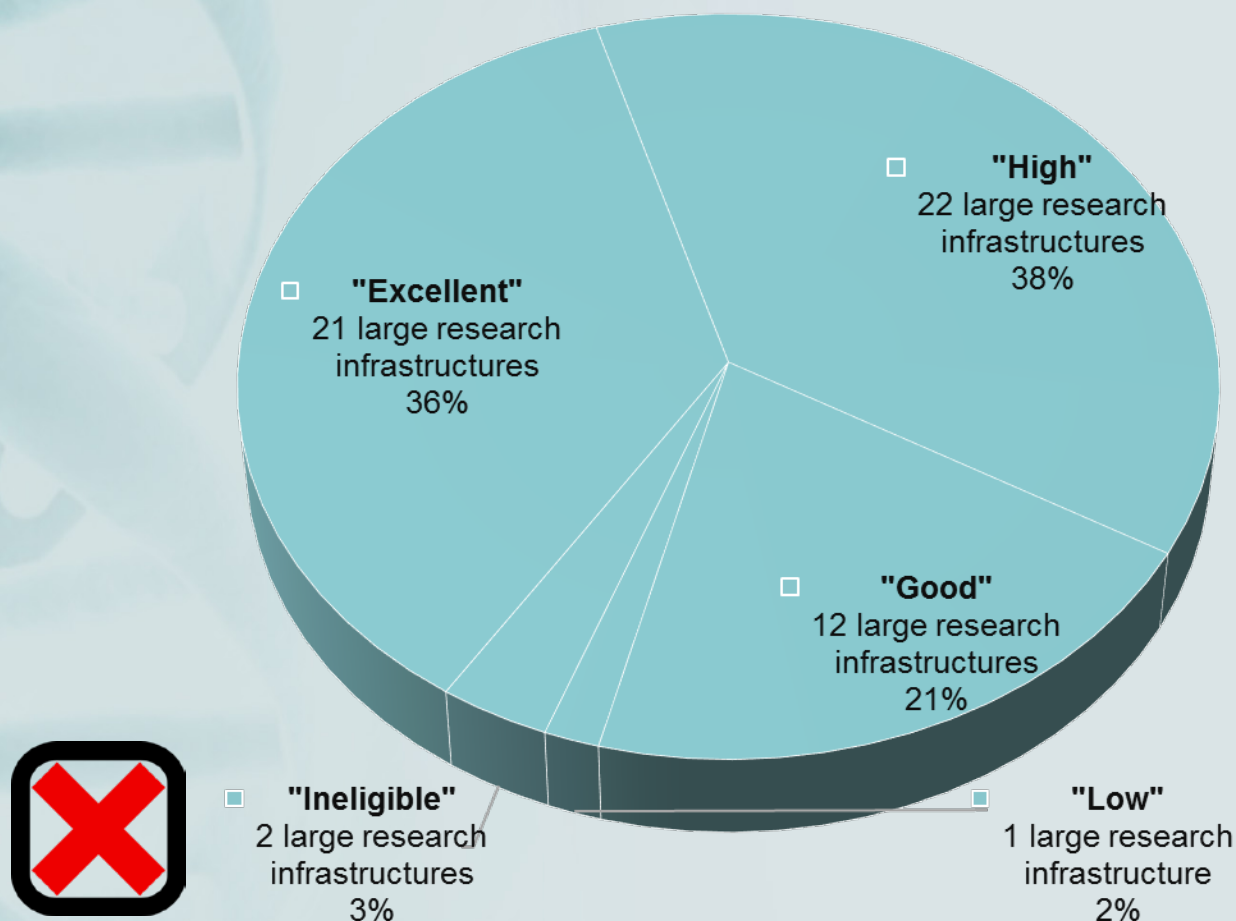
● Large research infrastructures' evaluation outcomes

- Division of (1) already financed large research infrastructures and (2) new large research infrastructures' projects in **6 performance based groups according to the overall evaluation scale**, thus indicating the science-based priority for public funding in direct proportion to quality-differentiated outcome of the evaluation
- **5 – Excellent quality**
- **4 – High quality**
- **3 – Good quality**
- **2 – Low quality**
- **1 – Very low quality**
- **0 – Does not comply with criteria of a large research infrastructure**



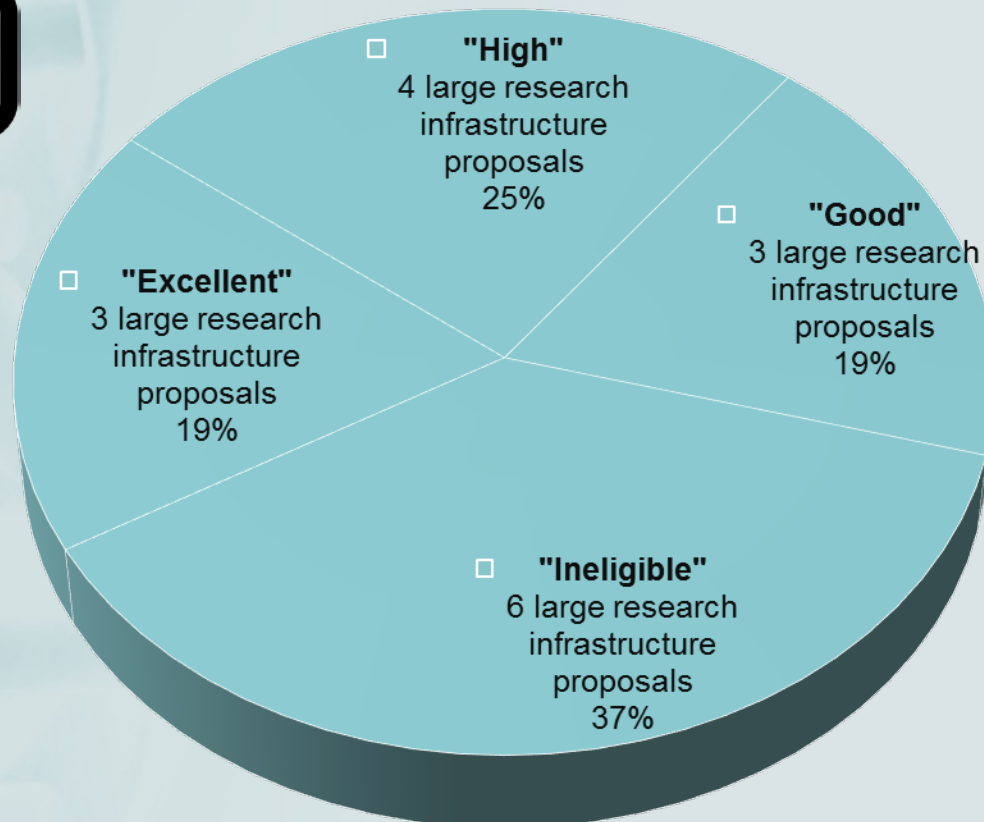
Interim evaluation of large research infrastructures

- **58 large research infrastructures** approved by the Government of the Czech Republic for public funding in the years 2016-2019 → **interim evaluated**



Ex-ante evaluation of large research infrastructures

- **17 new proposals submitted** for the 1st stage of evaluation
- **11 new proposals advanced** to the 2nd stage (2 advised to merge)
- **10 new proposals passed** through the evaluation



5. Current state-of-play and next steps

● Evaluation procedure

- Completed in July, consensus reports distributed in August
- Research, Development and Innovation Council informed in October
- Government of the Czech Republic will be informed in November

● Political decisions to be adopted

- Financial outlook should be determined in May 2018, when the state budget expenditures on R&D for the years 2019+ should be approved by the Government of the Czech Republic
- Funding of interim evaluated large research infrastructures in the years 2020-2022 and of ex-ante evaluated proposals in the years 2019/2020-2022





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● Follow-up

- 2018 update of **Roadmap** of Large Research Infrastructures of the Czech Republic for the years 2016-2022 and approval of the Roadmap by the Government of the Czech Republic
- Launch of the “**Research Infrastructures II**” call within the Operational Programme Research, Development and Education (funding of investment costs in 2020-2022)
- Preparation of the large research infrastructures **funding instrument** for the period 2022+ when the extensive use of European Structural and Investment Funds will terminate





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Thank you for your attention!

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