Extreme Light Infrastructure
ELI Beamlines

High-Energy Beam Pillar of the pan-European Research Infrastructure ELI

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Outline

- Basic introduction of ELI Beamlines
- Current status of implementation and challenges
- Status of recruitment of staff
- Development of research areas and cooperation
- Timeline to completion and first steps in operation
- Organization during start of operations
- Financing of operations
- Current status of establishment of spin-off and science park

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Research Campus

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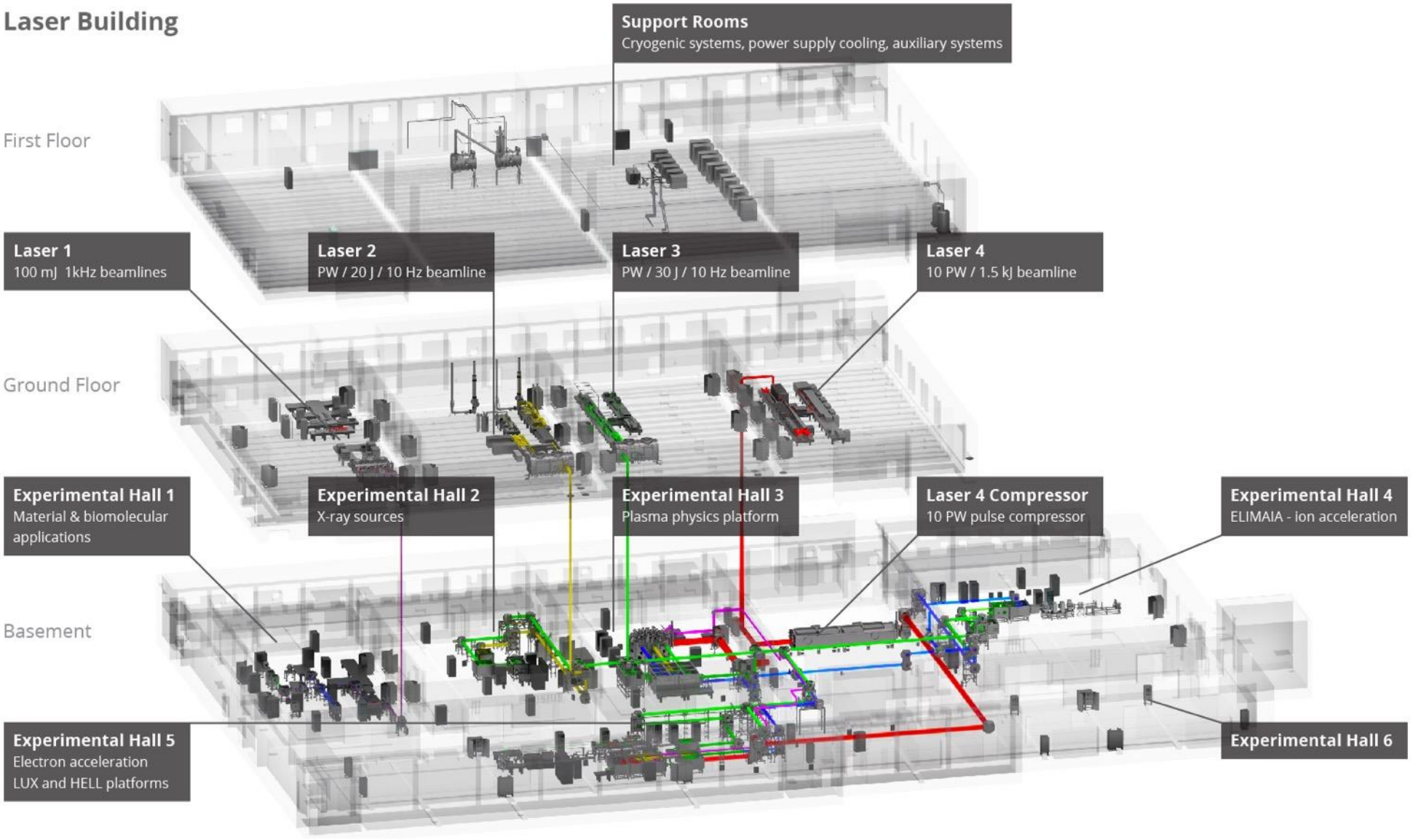
Facility Overview



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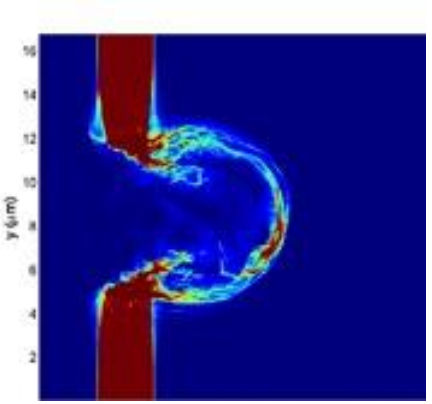
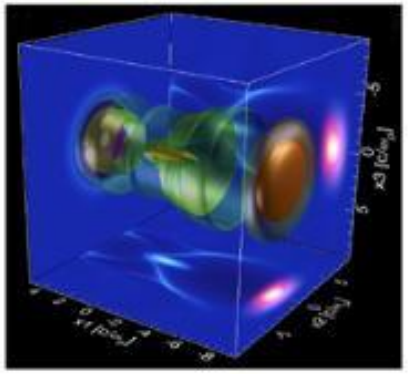
Research Areas

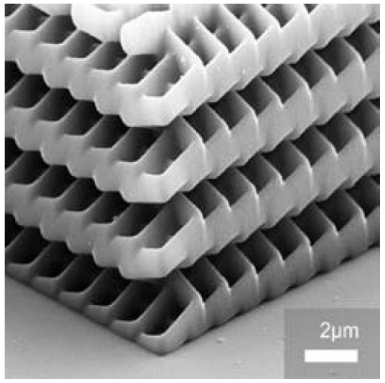
X-ray and gamma sources,
laboratory astrophysics



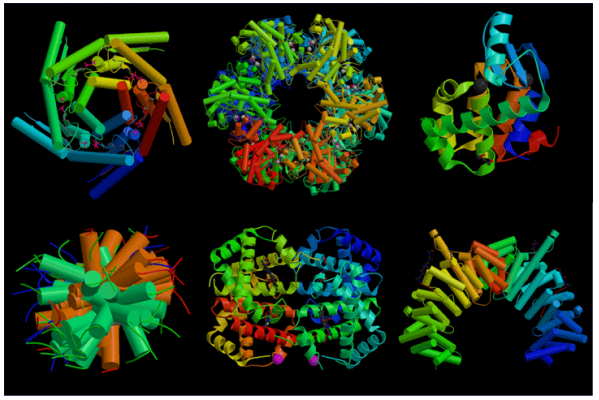
Proton acceleration



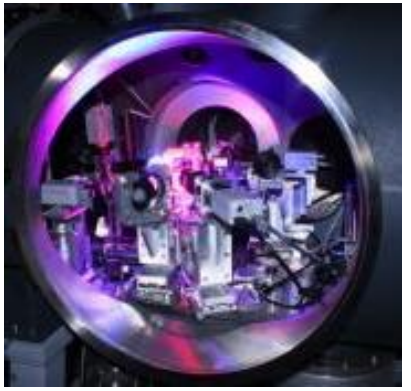
Electron acceleration



Nanotechnology
and advanced materials



Biology and biochemistry



Medical diagnostics
and treatment technology

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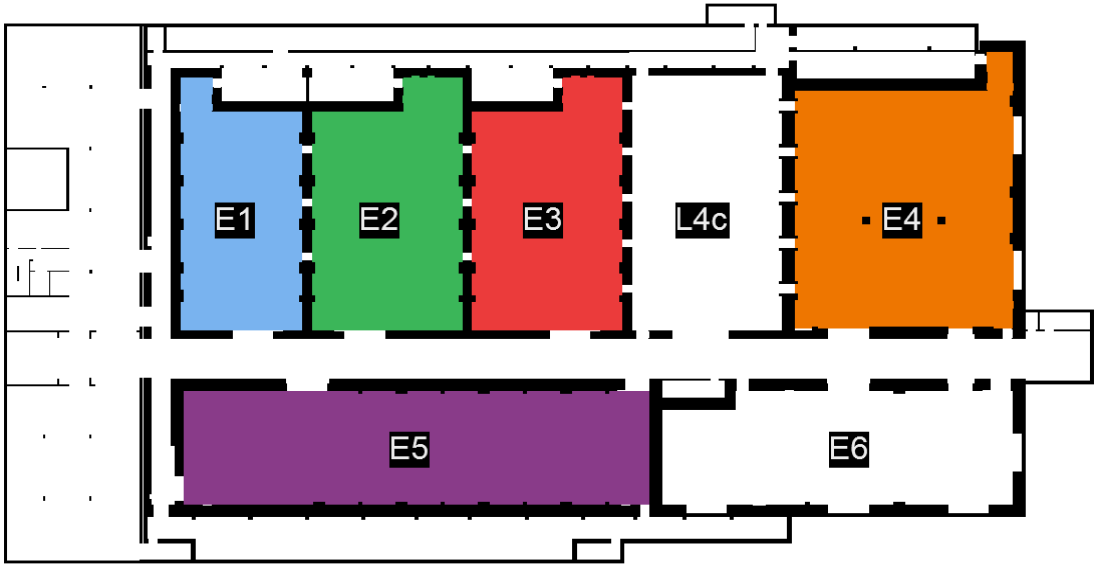
What users get

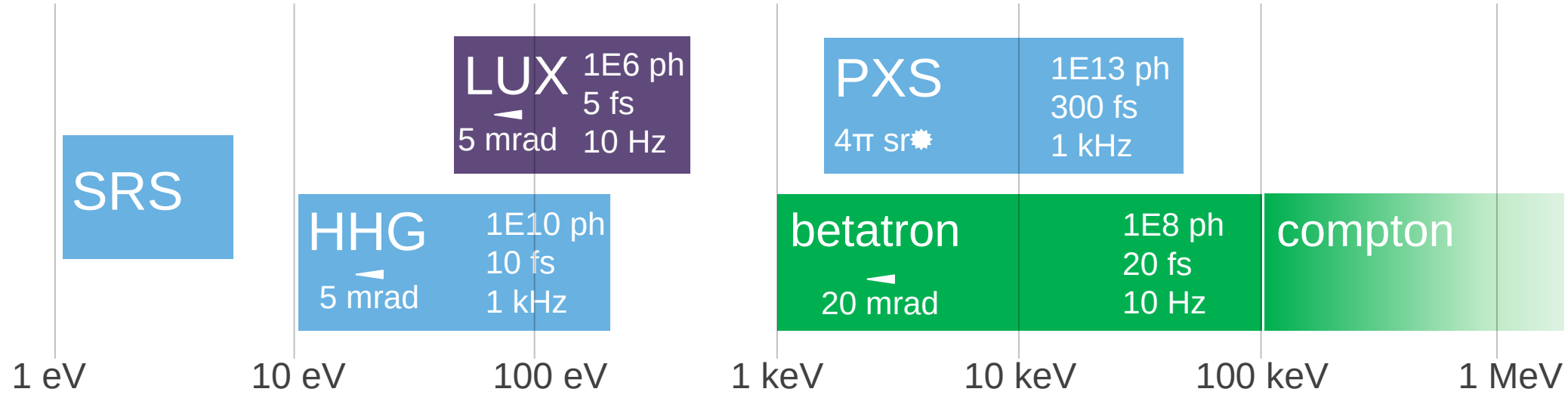


Coherent Diffractive Imaging
Atomic, Molecular and Optical Science
Soft X-ray Materials Science
X-ray phase contrast imaging
X-ray Diffraction and spectroscopy
Optical Spectroscopy and Molecular Dynamics

X-ray Phase contrast imaging
X-ray fluorescence/absorption spectroscopy

Coherent Diffractive Imaging (concept)

Secondary photon sources for users , short pulse



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ELI BL Project Phase 2 Completion

Building Infrastructure

- Permit of Use – 12/2015
  Building of the Year Award 2016
- Defects in LH – floor stability, Center vacuum, cooling
- Full Installation Readiness 9/2017

Laser program

- L1 – Installation and Commissioning, 30mJ / 1kHz
- L2 – Installation and Commissioning, 10J/10Hz, 2ns
- L3 – Installation and Commissioning 5/2018
- L4 – delayed development, delivery 2Q 2018, completion 12/2018

Experimental program

- HHG – Delivered, Installation and Commissioning 2017
- PXS – Delivered, Installation and Commissioning 2017
- P3 – plasma physics – delivery 9/2017, Installation and Commissioning
- ECU – delivery 10/2017, Installation and Commissioning
- Ion Accelerator – delivery 11/2017, Installation and Commissioning
- LUX – commissioning at DESY

Other activities

- Center Control System – test bed
- L1 and L3 Beam Transport
- HPC – in operation
- Indicators
  >200 publications
- H2020 Projects - ELITRANS, EUCALL
- Scientific Collaboration – more than 30 MoU

Completion 12/2017

Completion 3(6)/2018

Completion12/2018

Risks

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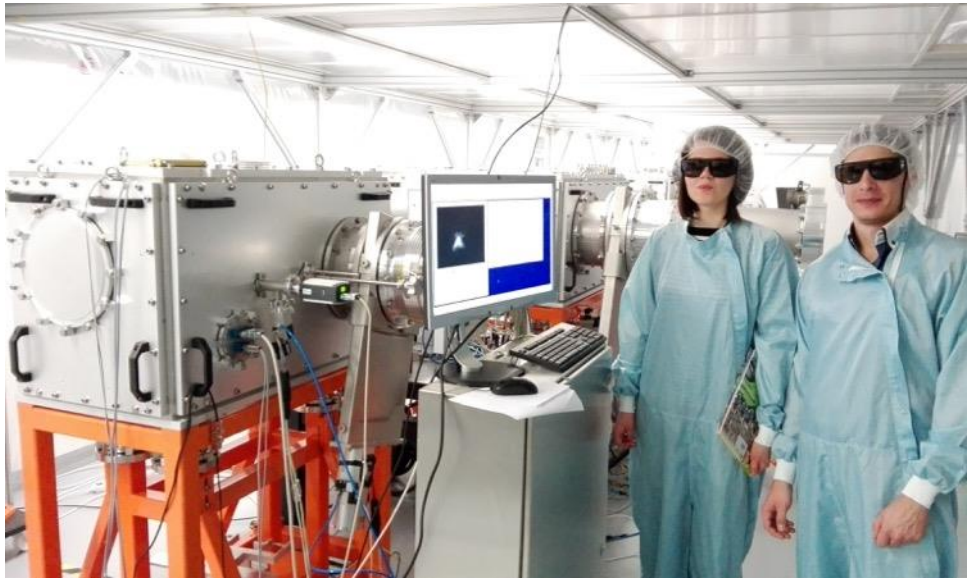
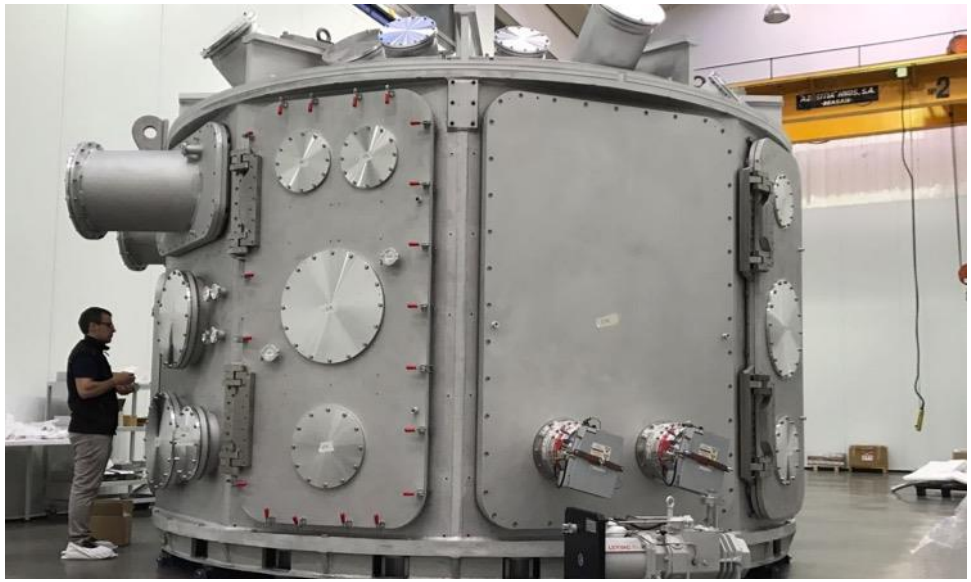
Major Achievements

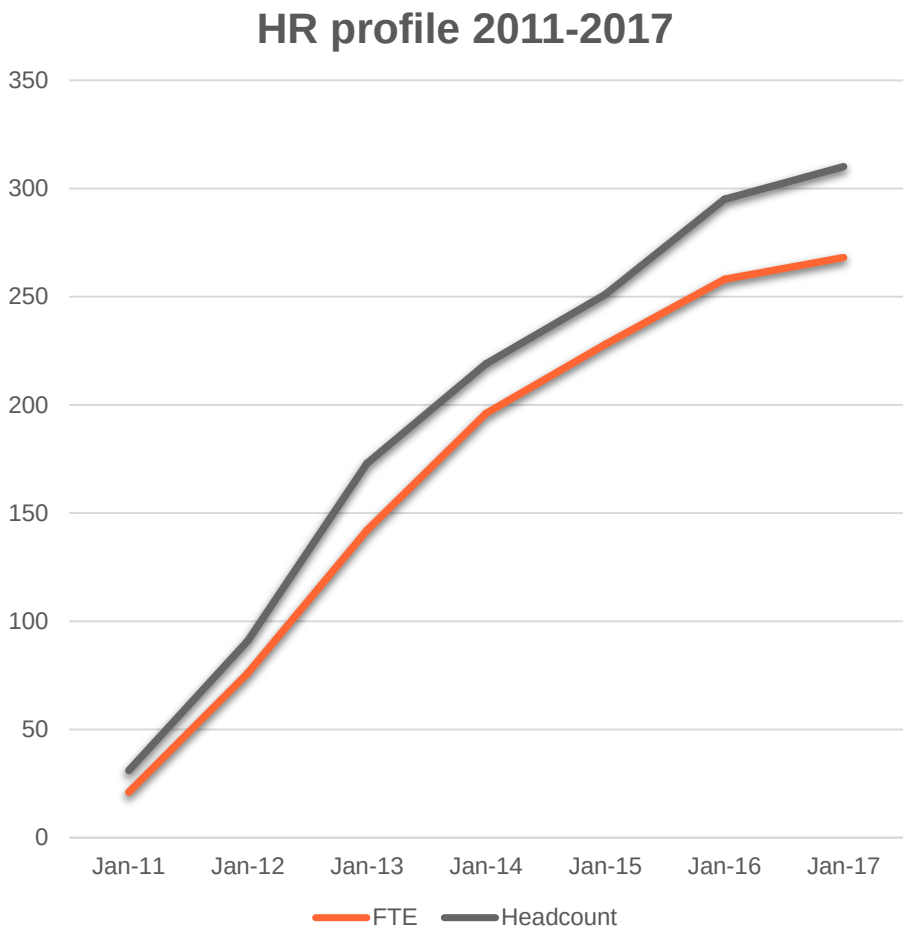
- Competent **international team** established with 300 people, 58 EU, 32 non-EU;
- **Building facility** finished: base build delivery with over 30 000 m2, vibration free, cleanrooms, with modern specialized labs
- Major equipment developed and ordered/installed
  - 4 **state of the art laser sources** developed and being installed,
  - 6 **secondary sources**, end stations for users being actually installed and commissioned,
  - **Modern control** and data acquisition system developed and actually installed
  - **HPC cluster** up and running to support simulations and post processing of experimental data
- **Established** QA, Systems Engineering and Safety **process** to address challenges of large and technologically complex project delivery
- Internationally recognized scientific programs established with over **200 scientific publications**, a number of patent filed or granted
- International **worldwide cooperation** has been established with major players in the field of photon based science, over 50 MoU established, partnership through H2020 projects ELITRAS and EUCALL
- The **user community** has been **attracted** via scientific and technical cooperation and also addressed with a large number of workshops and user meetings to secure a smooth start of user action by providing user defined tools and equipment
- A new way of preparing user experiments and user preparation has been established via internet (browser) based virtual 3D tools
- **ELIBIO and HIFI scientific projects** have been established (18 Mio Euro). The projects are led by Prof. J. Hajdu and Prof. S. V. Bulanov who are highly recognized in the fields

Major Achievements





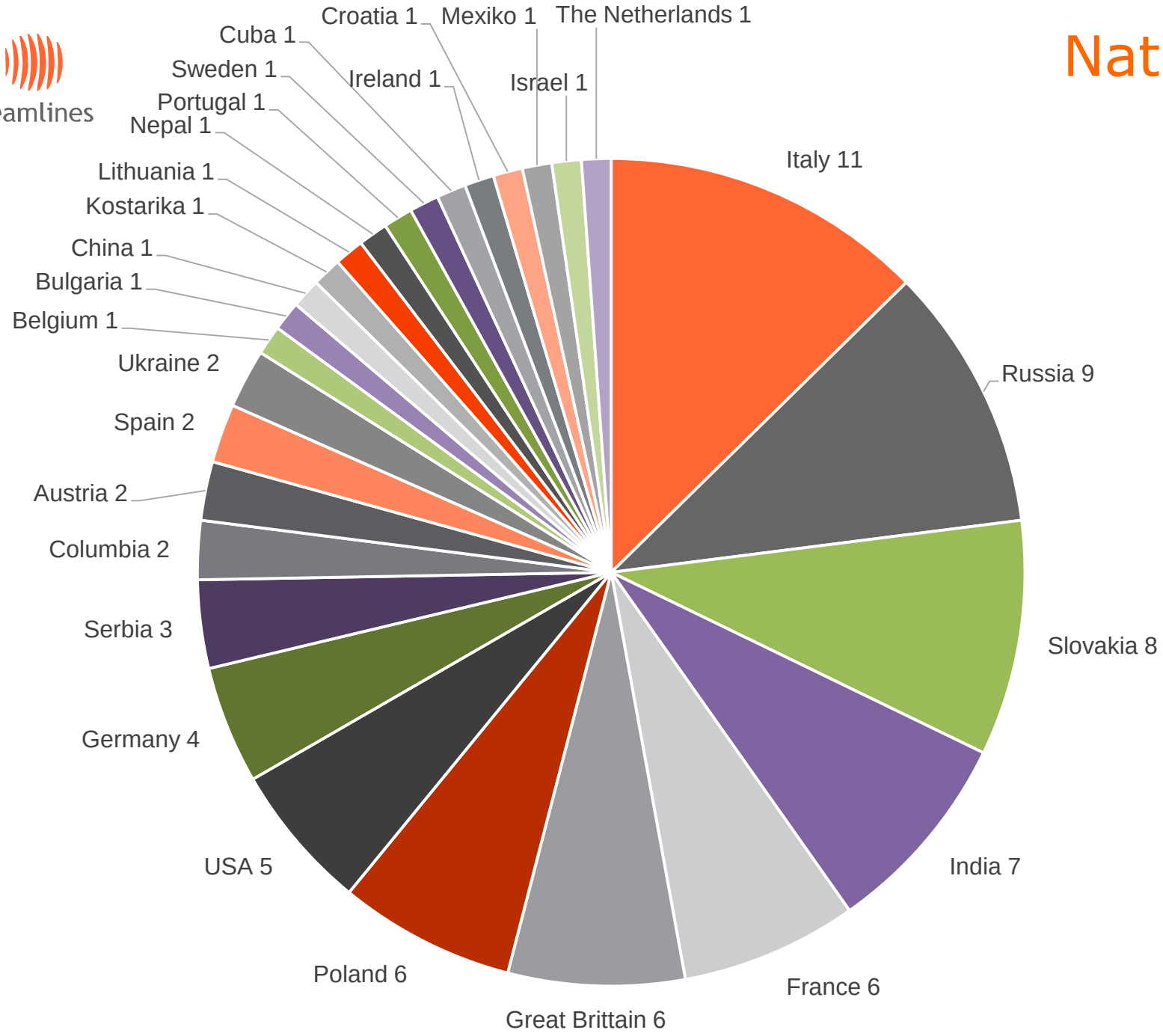
Staffing profile



300 FTE is the limit we shall need to be successful

Diversity and expertise is what makes us unique

Nationality



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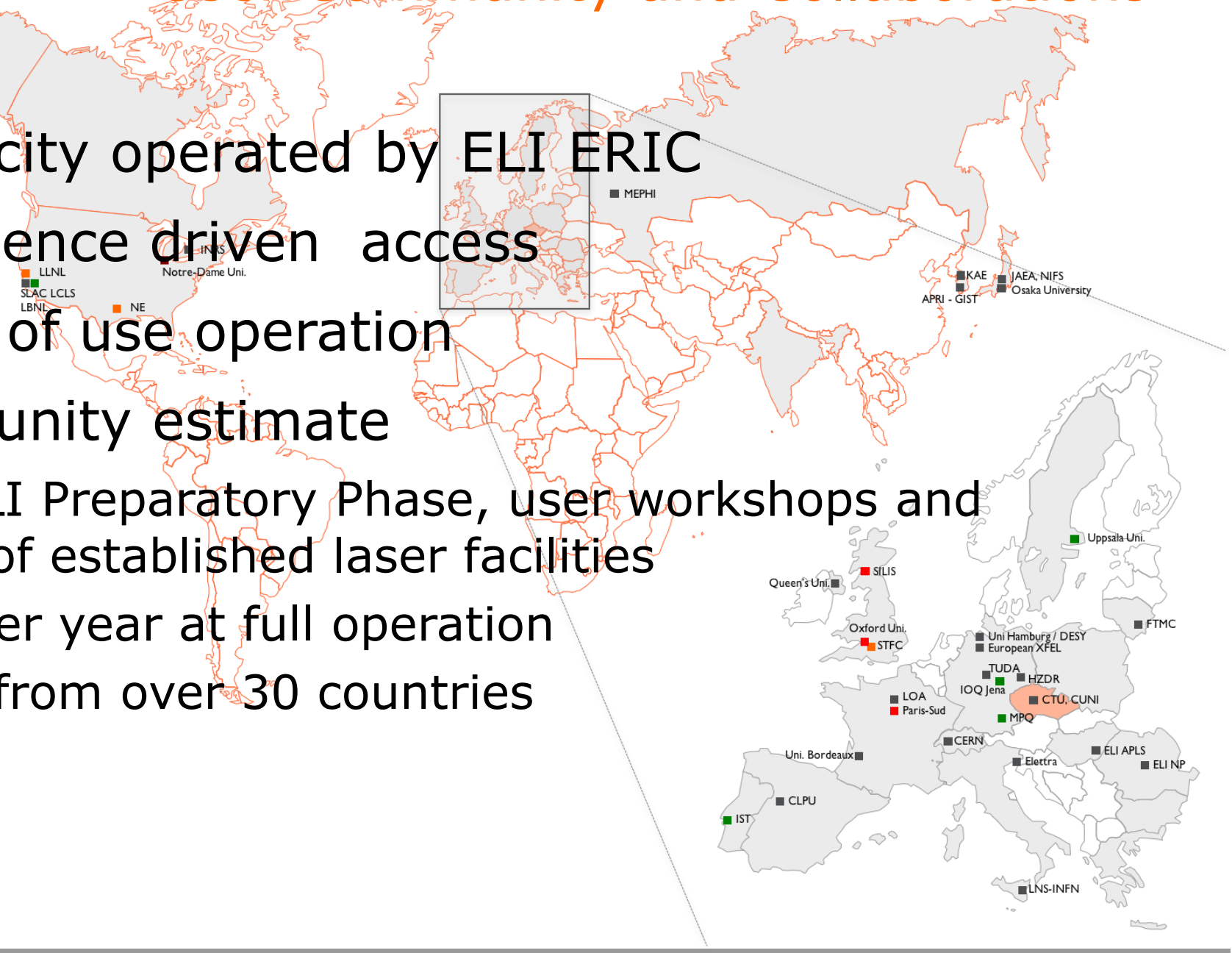
User Community and Collaborations

- 100% capacity operated by ELI ERIC
- Open excellence driven access
- 1 250 days of use operation
- User community estimate
  - Based on ELI Preparatory Phase, user workshops and experience of established laser facilities
  - 500 users per year at full operation
  - Originating from over 30 countries



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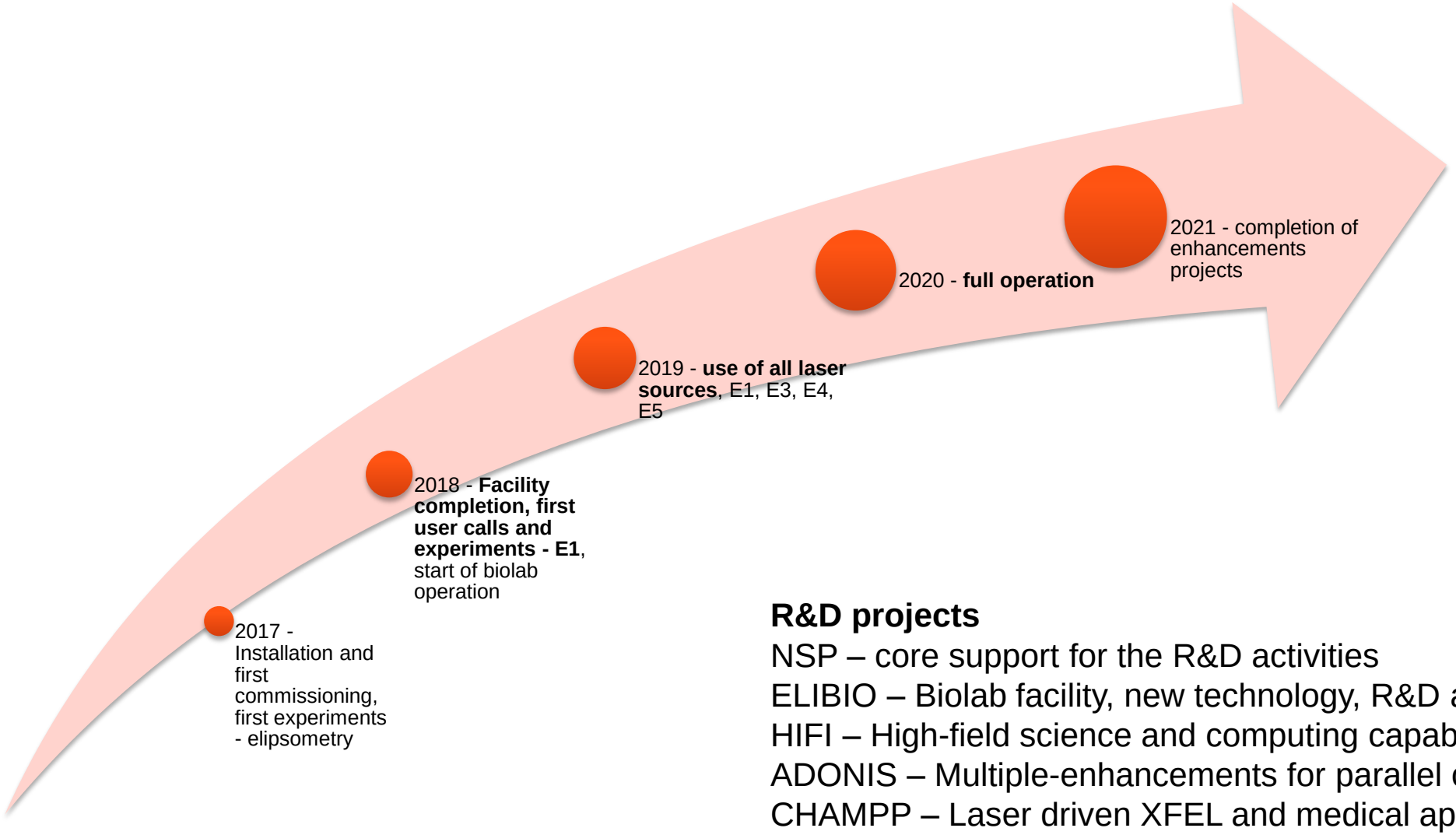
Access Policy

- Only the excellence of users make successful RI
  - The access policy must ensure the attraction of the best scientific users and the best results in the facilities
- Standardized procedure
  - European Charter for Access to RI, Peer Review Panel, Virtual User Office
- Excellence-driven access (*non-proprietary)*
  - accepted solely through independent peer review
- Market-driven access (proprietary)
  - shall be limited to 5-10%
- Specific access for training and testing
- Call "0" – 4Q 2017, Access mid 2018

Facility Completion & Mid-term Outlook



R&D projects

NSP – core support for the R&D activities
ELIBIO – Biolab facility, new technology, R&D activities
HIFI – High-field science and computing capabilities
ADONIS – Multiple-enhancements for parallel operation
CHAMPP – Laser driven XFEL and medical applications

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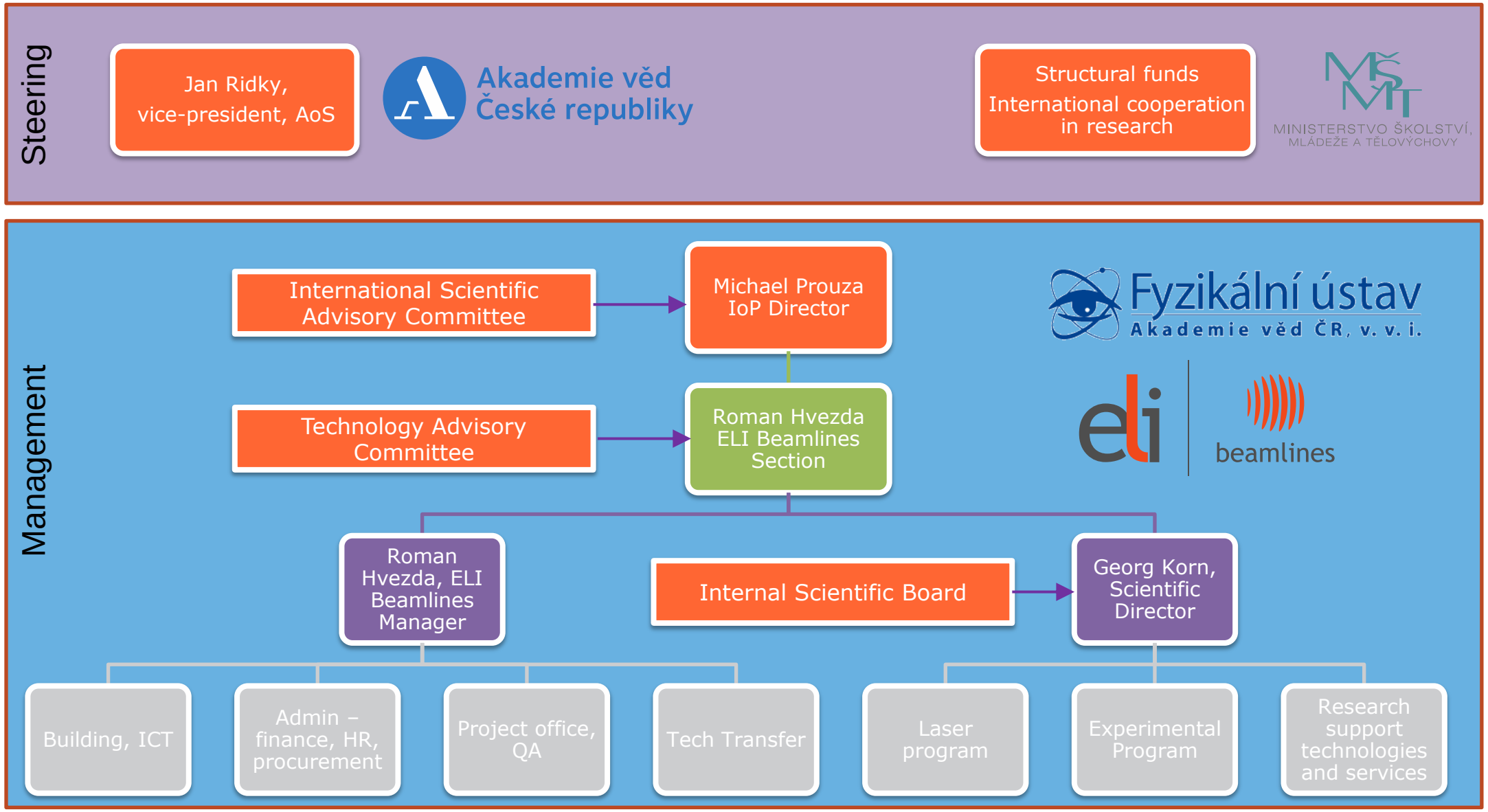
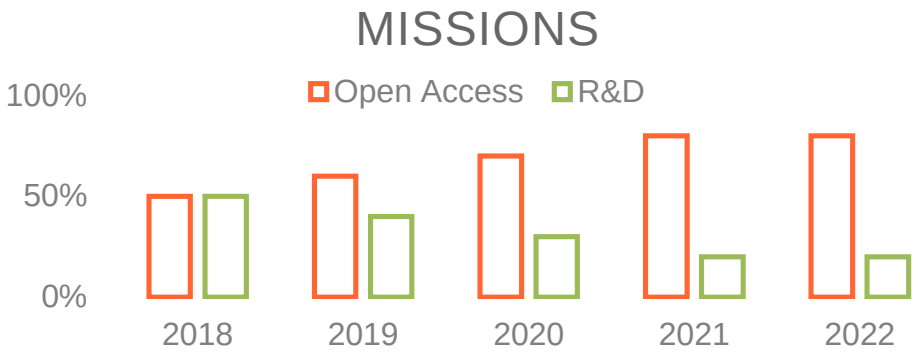
Upcoming 5 years

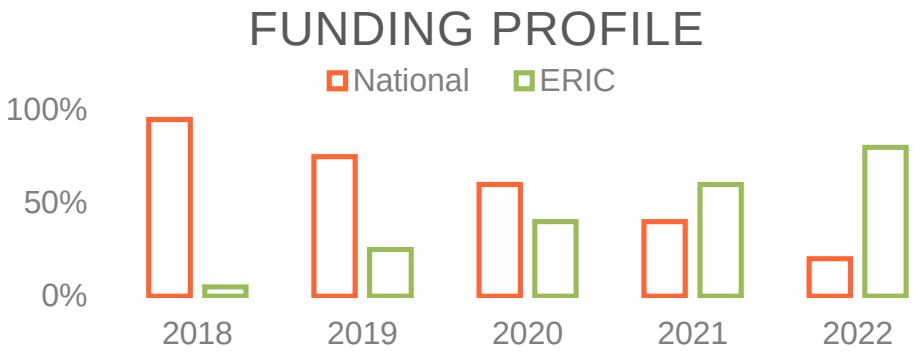
- Facility completion
  - Installation and commissioning of lasers and secondary sources and experimental areas to be done in 2017-2018, first operation and experimental application of PW class laser with up to 10 Hz repetition rates and 50mJ-100 mJ 15fs laser with 1 kHz repetition rate
  - Beginning of 2019 first experimental campaign with focused 10 PW laser (150fs-1.5 kJ)
- Completion of institutional arrangement for operation
  - Advance with ERIC foundation and conclude its formation in 1Q 2018
  - Forming long-term sustainable membership
- User Operations ramp-up
  - First ELI common call for users including all three pillars end of 2017
  - Start of user operation in 2018 for certain areas including end-stations with first scientific user and internal output papers
  - Putting ELI on the map of large scale facilities through well organized user action and highly cited scientific papers 2019-2020
- R&D projects execution
  - ELIBIO, HIFI –new scientific outputs in time resolved structural biology and high field science
  - Upgrade Plans - ADONIS – enhancement for parallel operation, CHAMPP – Laser driven XFEL, Teaming DESY, UHH

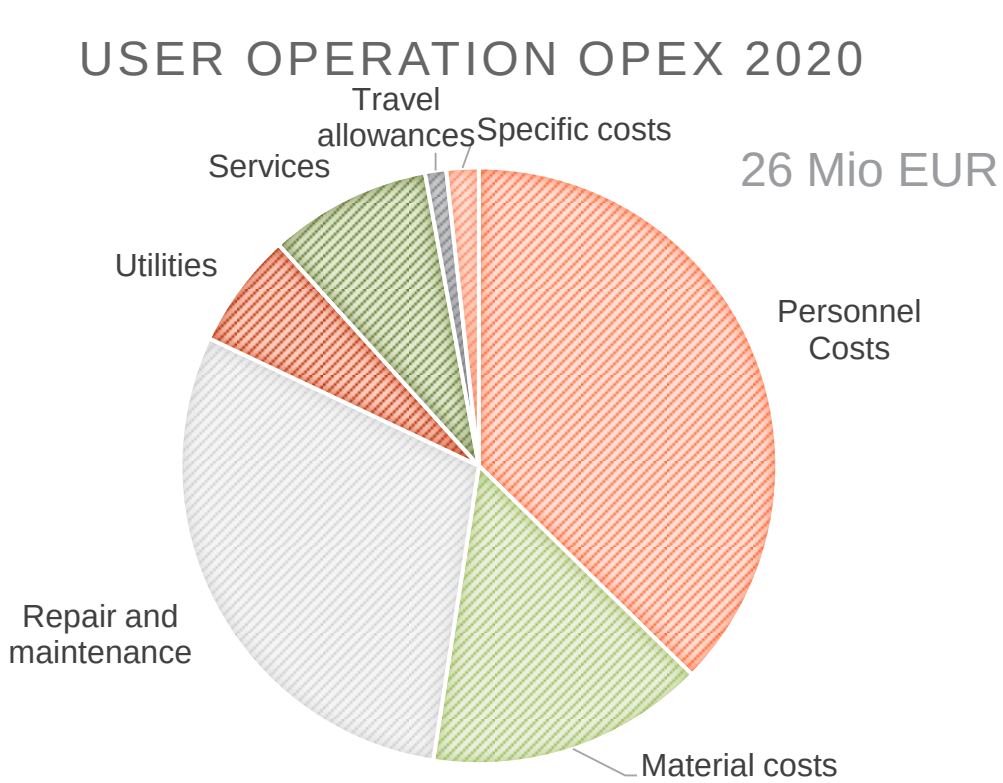
Governance / Management

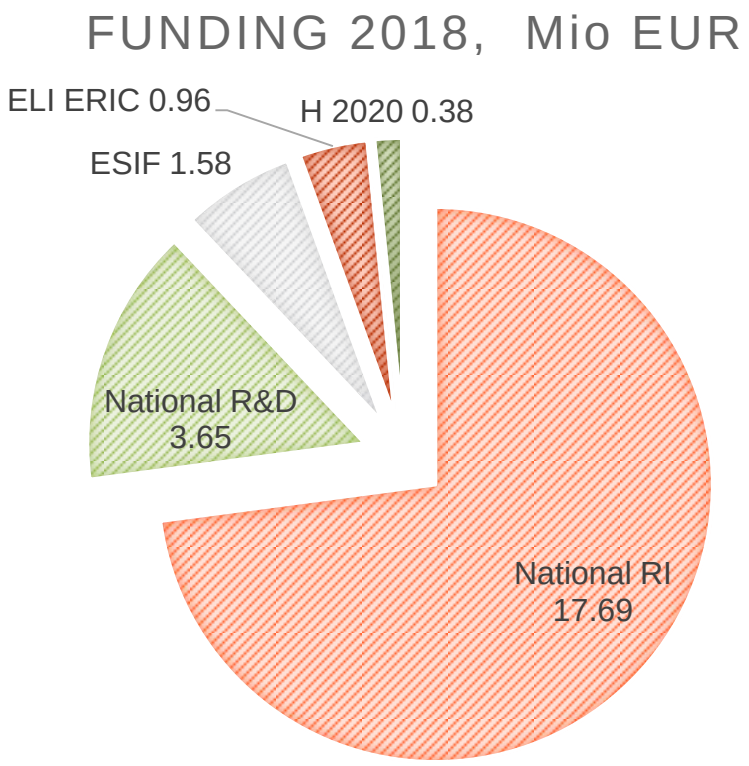


Financial aspects 2018-2022









Science and Technology Advanced Region

STAR

- Area of 6 km^2 on the south edge of Prague
- Direct access to planned D Metro line
- Excellent traffic connections
- Good access to Prague international airport
- Development areas available (up to 30 ha)
- High-quality local infrastructure
  - Offices, flats, services, leisure
  - 130M EUR
- Most Attractive region Region for Investment

ELI
a world class laser facility with high impact for society

EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání

MINISTERSTVO ŠKOLSTVÍ MLÁDEŽE A TĚLOVÝCHOVY

For info or further questions on this seminar and the activities of the JASPERS Networking Platform, please contact:

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