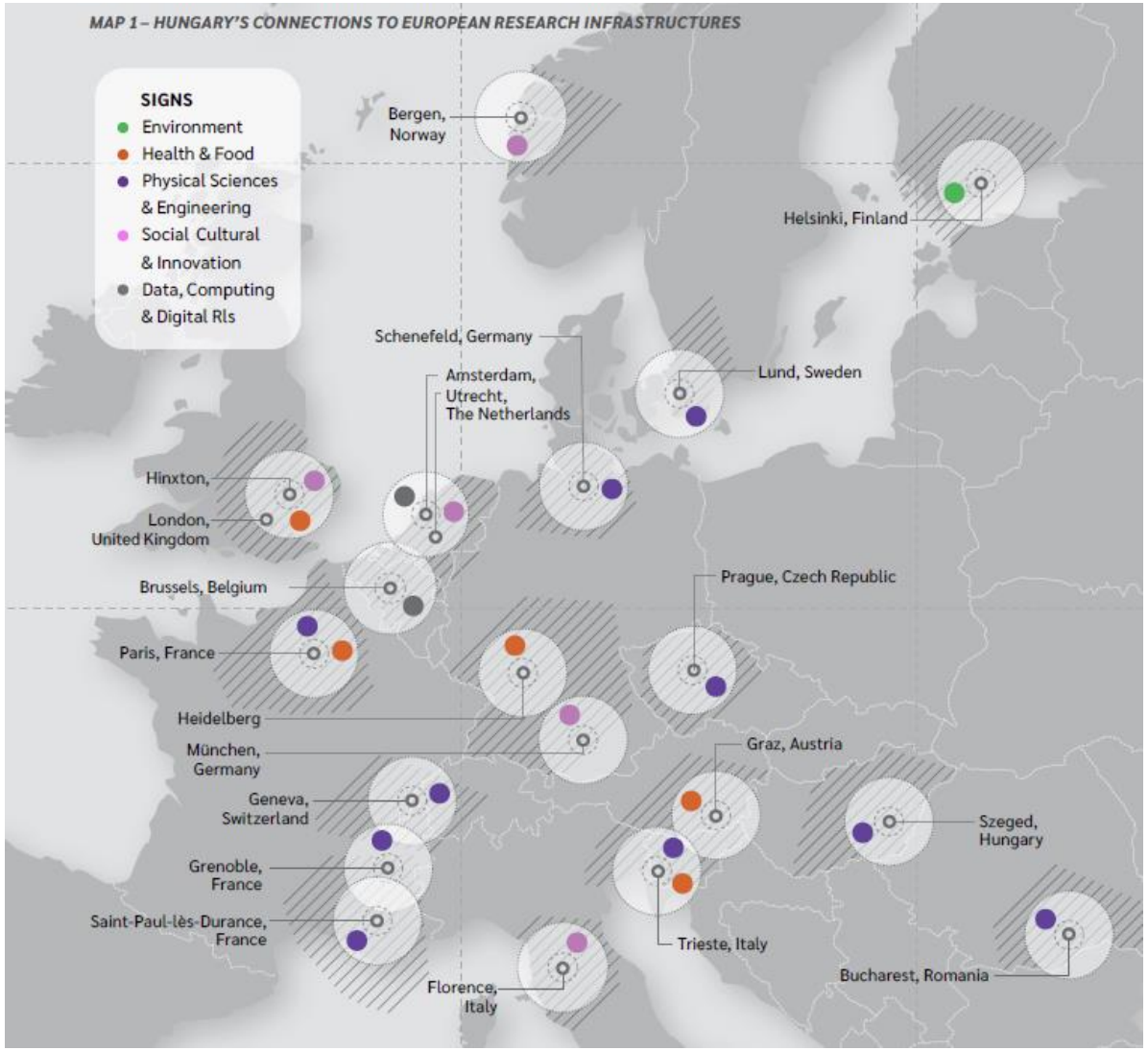
Large research infrastructures – The Hungarian approach

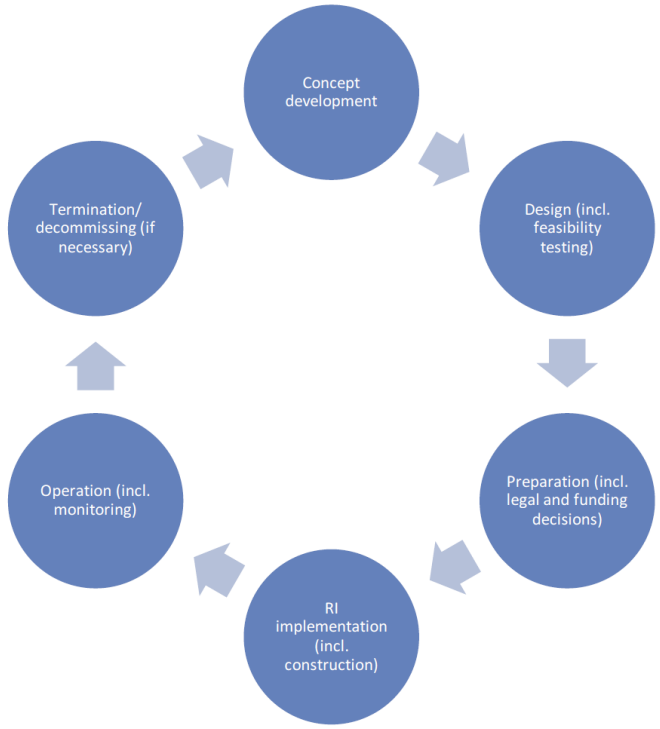


Zsolt Fülöp

National Research Infrastucture Committee
Hungary

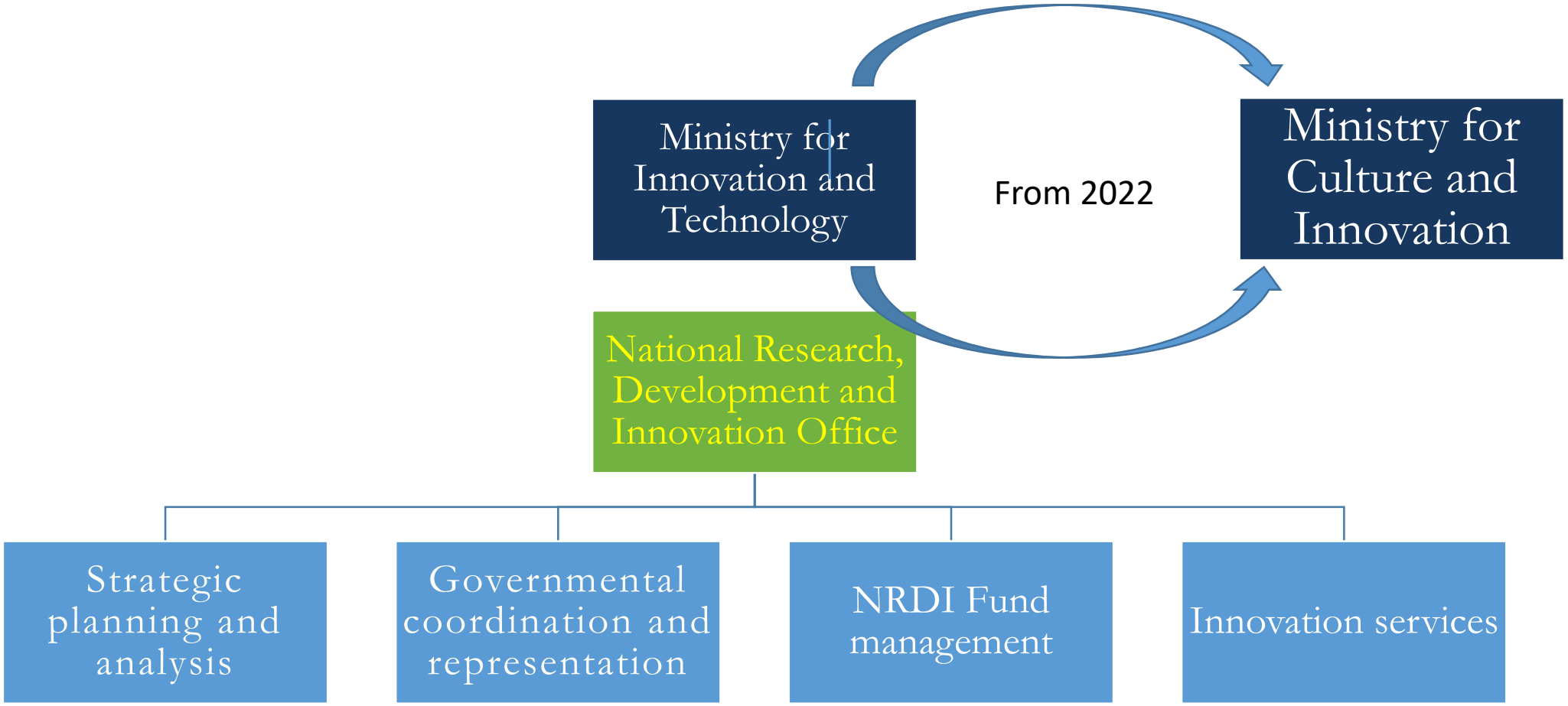
General remarks on successful research infrastructures

1. GENERALITIES
2. FINANCIAL SUSTAINABILITY
3. EFFECTIVE MANAGEMENT
4. TRACE THE SUCCESS (MONITORING)
5. HUMAN RESOURCES
6. USER ACCESS
7. NETWORKING



Type of research infrastructure	Description	Examples
Single-site facility	Unified body of equipment at one physical location	High-performance laser system; clean room; coastal observatory; Centre of Competence. E.g. Multi-purpose Hybrid Research Reactor for High-tech Applications (MYRRHA); European Solar Telescope (EST)
Distributed facility	Network of distributed instrumentation or collections, archives and scientific libraries	European Light Infrastructure (ELI); Council of European Social Science Data Archives; Central European Research Infrastructure Consortium (CERIC ERIC); International Centre for Advanced Studies on River-Sea Systems (DANUBIUS RI); European Plate Observing System (EPOS)
Mobile facility	Mobile vehicles specially designed for scientific research	Research vessels, satellite and aircraft observation facilities
Virtual facility (e-infrastructures)	ICT-based system for scientific research, including high-capacity communication networks and computing facilities	European Grid Computing Infrastructure; Digital Research Infrastructure for the Arts and Humanities (DARIAH); Partnership for Advanced Computing in Europe (PRACE)

HUNGARIAN LANDSCAPE: NATIONAL RESEARCH, DEVELOPMENT AND INNOVATION OFFICE



FINANCING PILLARS OF THE NRDI FUND – 2021

Individual excellence	Thematic programmes	Business innovation
Horizontal programmes	National security and defense Health National challenges: Secure society and environment, Industry and digitization, Culture and family	Horizontal programmes
NRDI Fund Research sub-fund: HUF 105.762 billion		NRDI Fund Innovation sub-fund: 76.53 billion

Gov. Decree 1077/2021. (II. 27.) on 2021 Programme Strategy of NRDI Fund

The National Research Infrastructure Committee (NRIC)

Chair: Zsolt Fülöp, Atomki
Vice-chair: István Szabó, NRDIO
Members: 6 scientific advisors – according to the ESFRI thematic areas

Tasks

Makes proposals for:

- joining new international research infrastructures
- the development of domestic research infrastructures

Makes recommendations for:

- the evidence based design of funding schemes supporting research infrastructures
- the establishment of a monitoring and evaluation system of RIs and monitoring of our international memberships
- all matters concerning the domestic research infrastructures

Hungary's membership in international research infrastructures (RIs)

Σ 25 RI

Health & Food (7)

BBMRI-ERIC
ECRIN
European Clinical Research Infrastructure Network
elixir
elixir-europe.org
EMBL
erinha
European Research Infrastructure on Highly Pathogenic Agents
EURO-BIOIMAGING
ICGEB

Physical Sciences & Engineering (8)

CERN
ALICE
CERIC
Central European Research Infrastructure Consortium
CMS
eli
attosecond
EuPRAXIA
ESRF
The European Synchrotron
European XFEL
ess
EUROPEAN SPALLATION SOURCE

Social & Cultural Innovation (7)

cessda
Consortium of European Social Sciences Data Archives
CLARIN
European Social Survey
GGP
E-RIHS
EUROPEAN RESEARCH INFRASTRUCTURE FOR HERITAGE SCIENCE
GUIDE
SHARE
Survey of Health, Ageing and Retirement in Europe
50+ in Europe

Energy (1)

iter

Environment (1)

ICOS
Integrated Carbon Observation System

E-infrastructures (1)

PRACE

Membership fees: Σ 12,8 m EUR/2021 (4 800 m HUF/2021)

Identifying the TOP national RIs and networks - survey

Aim

- identifying the best domestic research infrastructures and infrastructure networks
- providing international visibility of Hungary's research excellence
- making research services visible and available
- awarding the Outstanding Research Infrastructure title to RIs

April 2021 – launching the online questionnaire

two-step peer review evaluation (with the coordination of the NRIC)

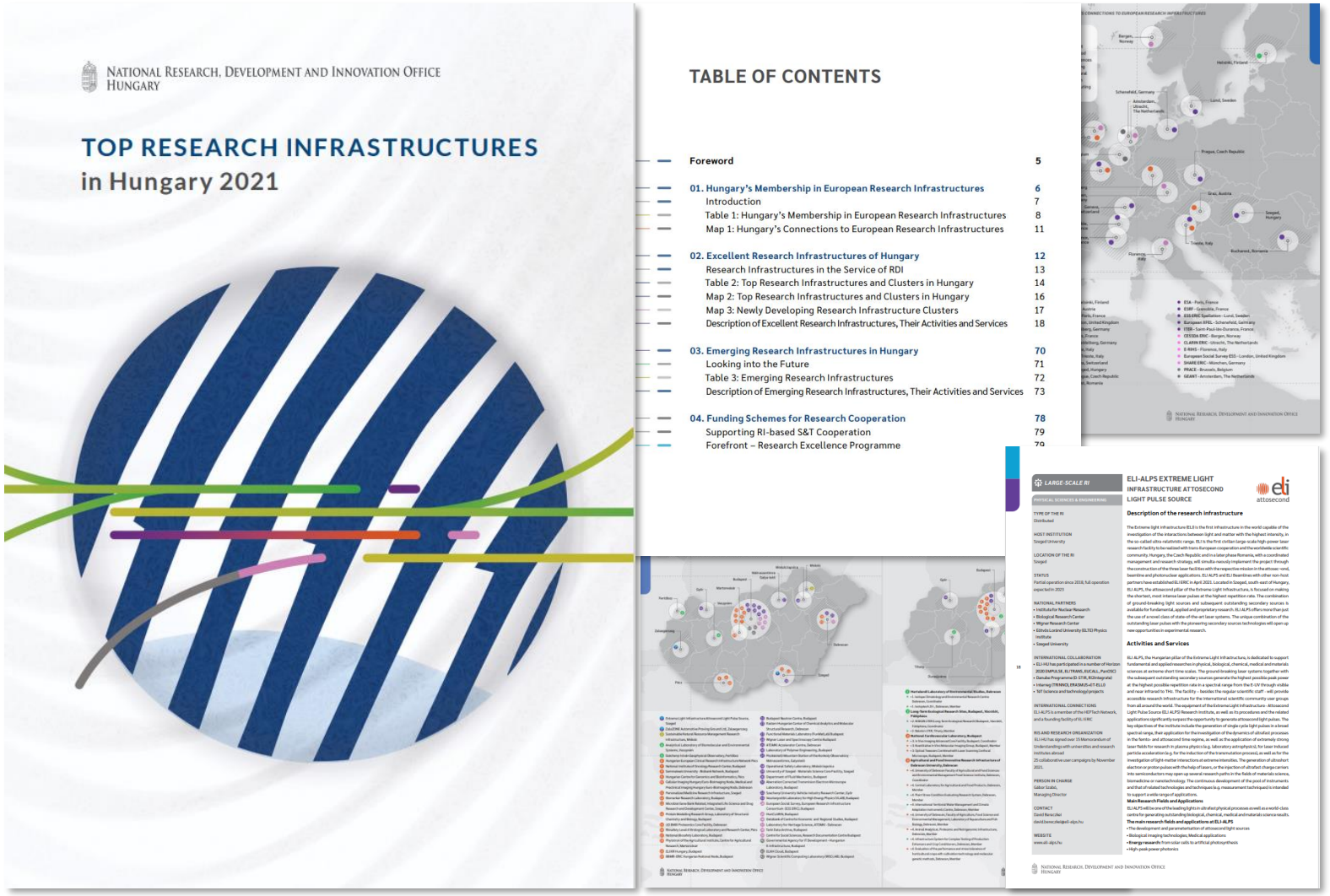
October 2021 – decision

December 2021 – awarding ceremony

Evaluation

- uniqueness, scientific excellence, national strategic significance, size of the network
- international cooperation, relations
- open access and use
- education and training
- industrial innovation cooperation

Top research infrastructures in Hungary - 2021



$2 + 40 + 10 + 5 =$

$57 =$

- 2 Large scale key RIs
- 40 Excellent RI
- 10 Excellent new RI clusters
- 5 Emerging RIs

https://nkfih.gov.hu/english/top-rife-hungary2021

Supporting RI-based S&T cooperation – HU TNA scheme

- **2021-4.1.2-NEMZ_KI – call for proposal**

https://nkfih.gov.hu/english/nrdi-fund/support-for-the-use-of-international-national-research-infrastructures-2021-412-nemz-ki/call-for-applications

‚A' Sub-program (outgoing)
Supporting the use of research and measurement opportunities provided by international research infrastructures.

‚B' Sub-program (incoming)
Supporting the use of the significant domestic research infrastructures by international researchers

NEW

- **Announcement:** 28 September 2021
- **Funding/project**: 0,5 - 2 mFt (EUR 1 350-5 500)
- **Earmarked budget**: HUF 100 million (kEUR 280)
- **Eligible costs** of the researchers or PhD, MSc students related to
  - outgoing/incoming travel
  - stay of abroad/in Hungary
  - project-related travel within the given country
  - disseminating the results of the project
  - participation in international conferences
  - cost of materials, tools and instrumentation
- **Cut-off dates: 31 May 2022, 31 Aug 2022**

Flagship 1: The ELI ERIC Facilities

The mission of ELI ERIC is to provide access for European and international researchers to the ELI Facilities in the Czech Republic and Hungary.

ELI Attosecond Light Pulse Source
www.eli-alps.hu

ELI-Nuclear Photonics
Romania

The third ELI facility is expected to join after 2023

ELI Beamlines
www.eli-beams.eu

ELI ERIC is a single, multi-site organisation

A European Research Infrastructure Consortium – an ERIC

This new legal form enables the participation of States as member countries to govern the ELI Facilities jointly and make them available to the scientific community as a single international organisation. Its headquarters are in Dolní Břežany in the Czech Republic.

***The Czech Republic**, Founding Member*
Host of Seat

***Hungary**, Founding Member*
Host

Italian Republic
Founding Member

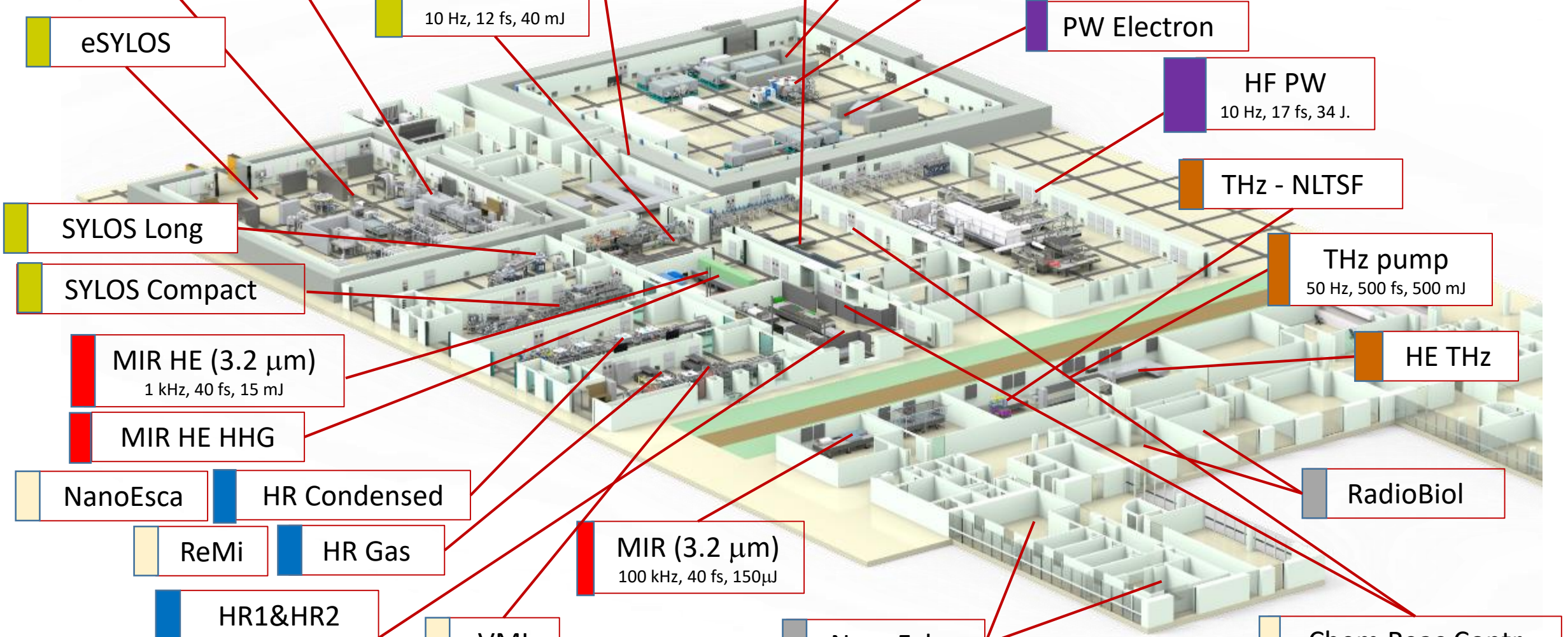
Lithuania
Founding Member

Federal Republic of Germany
Founding Observer

Bulgaria
Founding Observer

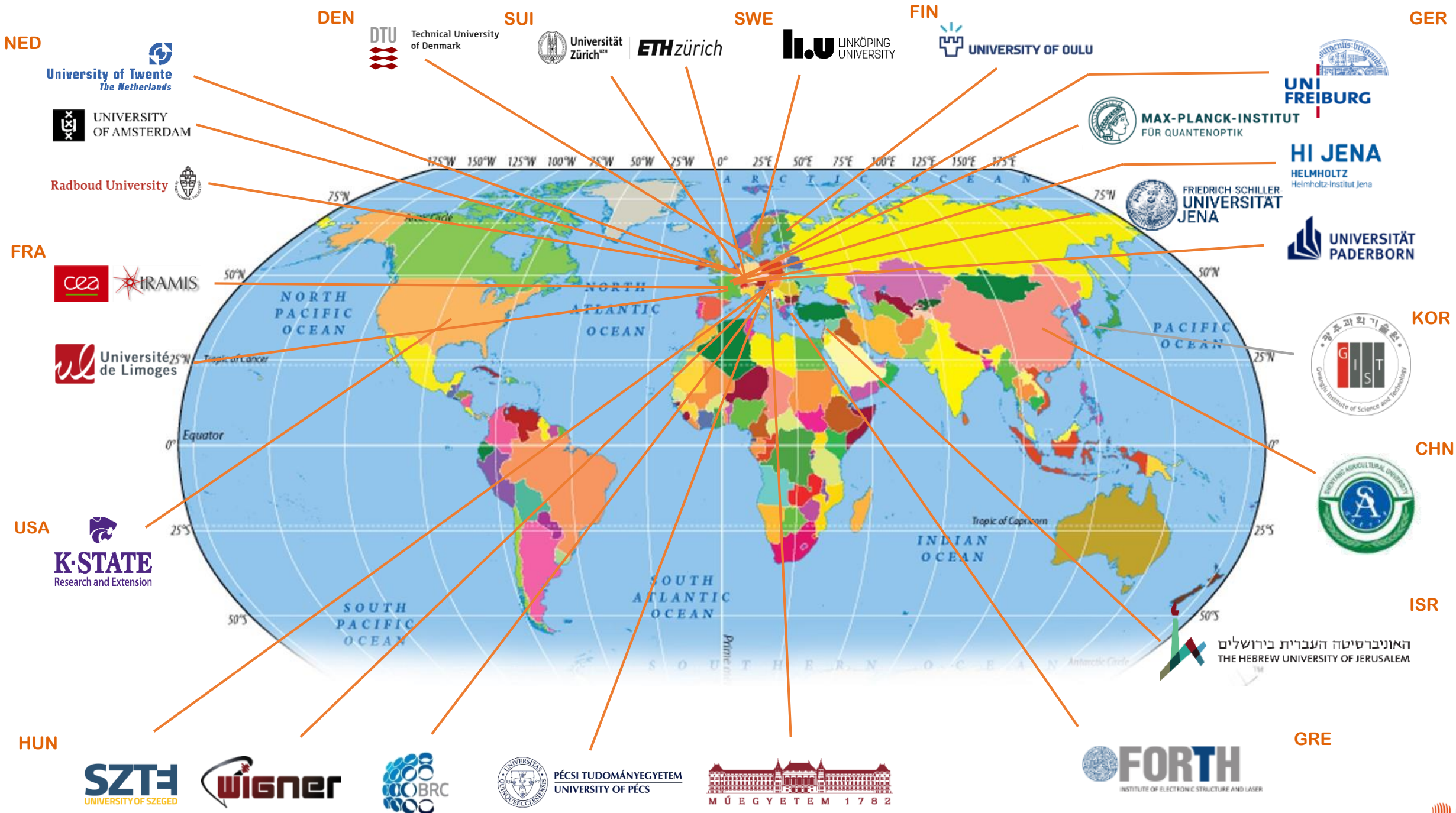
ELI ERIC involves the Czech Republic, Hungary, Italy and Lithuania as founding Members. Both Germany and Bulgaria are Founding Observers. ***Romania and ELI-NP are also expected to join the ELI ERIC consortium, which is open to European and non-European countries to join its membership.***

Facility overview



User Access at ELI ERIC
Three modes of access

- **Excellence-Based Access** – Evaluation of proposals by international peer-review panels. Results of experiments published and open.
- **Mission-Based Access** – Thematic research granted on the basis of scientific missions pursuing challenges. Proposals reviewed by international panels. Results published and open.
- **Proprietary Access** – Paid access for industrial or other users. Results are retained by the user, consistent with ELI ERIC's Data and IPR Policy.


NED
University of Twente
The Netherlands
UNIVERSITY OF AMSTERDAM
Radboud University
FRA
cea
IRAMIS
Université de Limoges
USA
K-STATE
Research and Extension
HUN
SZTE
UNIVERSITY OF SZEGED
wigner
BRC
DEN
DTU
Technical University of Denmark
SUI
Universität Zürich
ETH zürich
SWE
LINKÖPING UNIVERSITY
FIN
UNIVERSITY OF OULU
GER
UNI FREIBURG
MAX-PLANCK-INSTITUT
FÜR QUANTENOPTIK
HI JENA
HELMHOLTZ
Helmholtz-Institut Jena
FRIEDRICH SCHILLER
UNIVERSITÄT
JENA
UNIVERSITÄT
PADERBORN
KOR
GIST
CHN
ISR
האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM
GRE
FORTH
INSTITUTE OF ELECTRONIC STRUCTURE AND LASER
PÉCSI TUDOMÁNYEGYETEM
UNIVERSITY OF PÉCS
MŰEGYETEM 1782
NORTH PACIFIC OCEAN
NORTH ATLANTIC OCEAN
SOUTH PACIFIC OCEAN
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
PACIFIC OCEAN
ARCTIC OCEAN
SOUTHERN OCEAN
Equator
Tropic of Cancer
Tropic of Capricorn
Arctic Circle
Antarctic Circle
Prime Meridian
75°N
50°N
25°N
0°
25°S
50°S
75°S
125°W
150°W
125°W
100°W
75°W
50°W
25°W
0°
25°E
50°E
75°E
100°E
125°E
150°E
175°E
eli
attosecond

ELI ERIC 1st User Call

Published end of May 2022

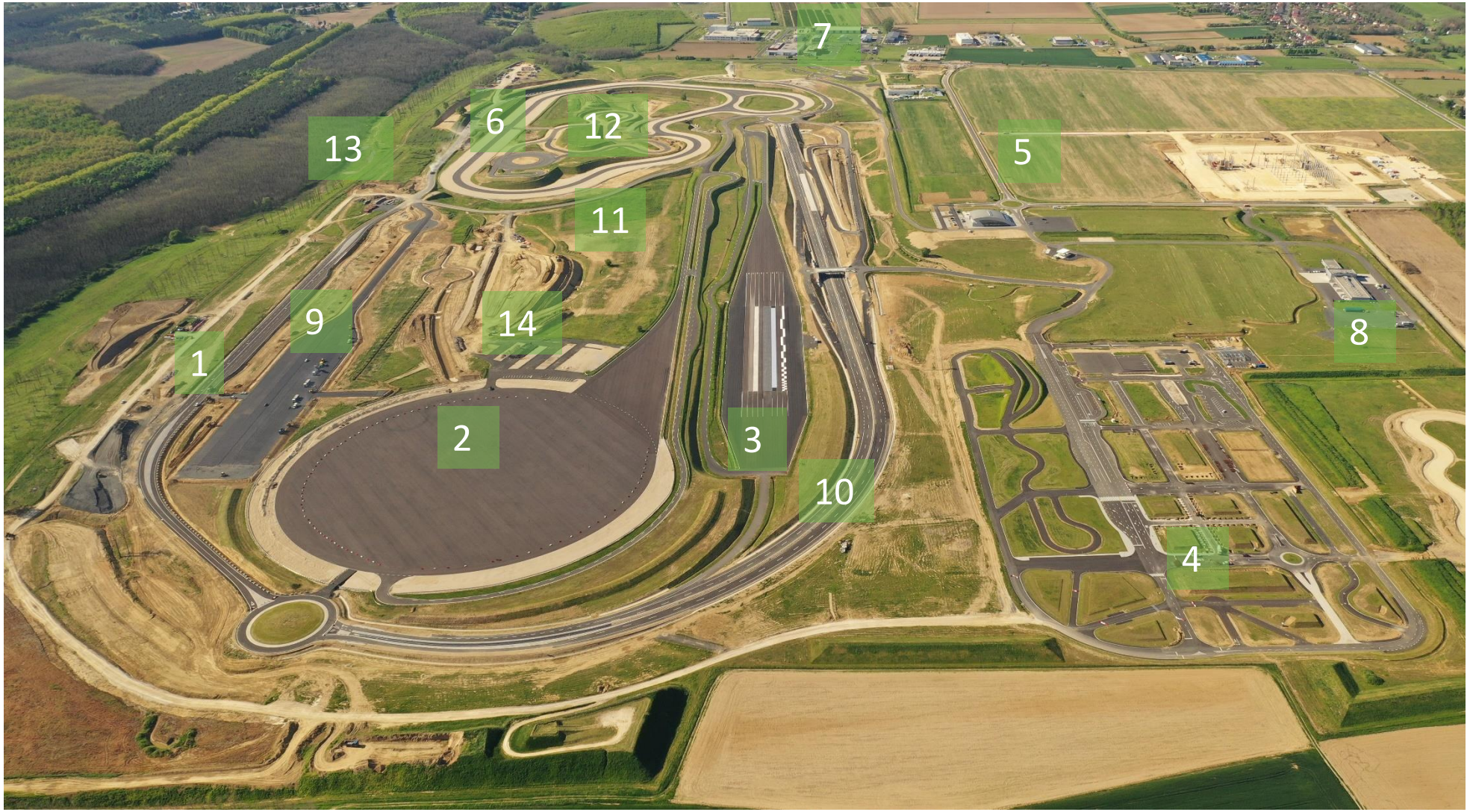
https://www.eli-laser.eu

- **The call will run October 2022 through March 2023**
- **Proposals will be accepted through August**
- **There will be more than eight instruments**
- **All instruments have been thoroughly tested during commissioning**
- **Advise proposers to contact the facilities for technical questions**
- **The 2nd call will be published January 2023**

Flagship 2: ZalaZONE

The most comprehensive vehicle validation environment in the world with autonomous elements

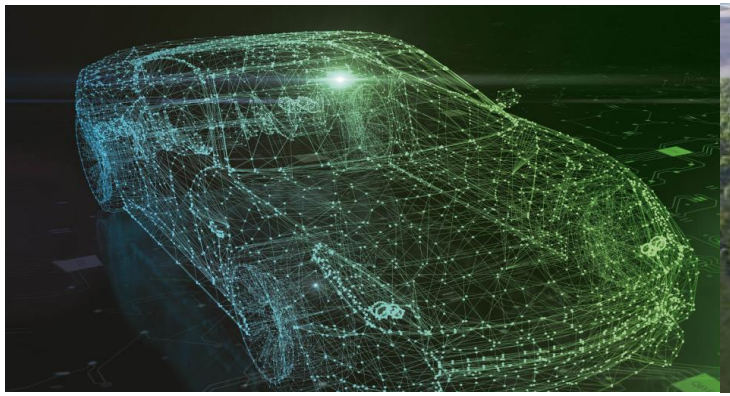
INNOVATION AT WORK



Available:

1. Highway
2. Driving dynamics surface
3. Brake measurement tracks
4. Smart city
5. Conference center
6. High-speed handling
7. University track
8. Test center
9. ADAS surface
10. Freeway
11. Noise measurement tracks
12. Wet handling courses
13. Country road
14. Hill

ZalaZONE Automotive Test Ground Ltd.



ZalaZONE Park is a dynamically developing industrial area next to the Zalaegerszeg Automotive Test Track, a 15-hectare smart city environment. It is focused on ensuring a competitive environment for testing, validation, modern technologies and research and development.

Research and innovation activities:

- Cutting-edge research,
- Preparatory education for the future,
- Widespread dissemination of research results,
- Value-creating knowledge transfer,

ZalaZONE Research and Technology Centre

- Rented workshops for university research groups,
- Dual higher education training,
- Industrial laboratories,
- Start-up incubation centre.

ZalaZONE Test Centre

R&I Head Office, priority projects.

ZalaZONE track parameters

800 m total length, Dynamic surface, Low-μ section, Smart City, Science Park

zone

The complete ZalaZONE ecosystem in the Science Park concept

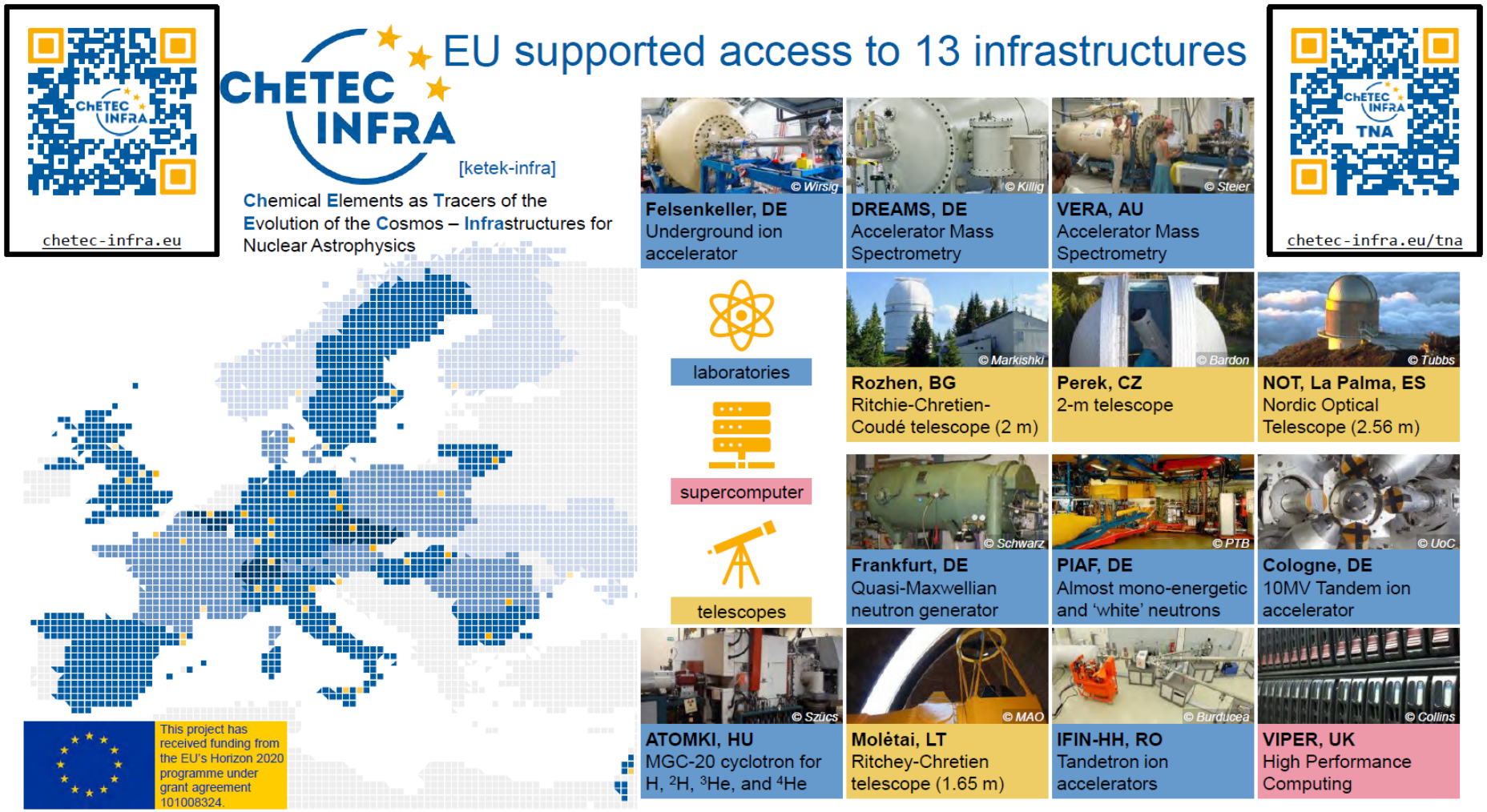
INNOVATION AT WORK

Some of its elements are already working!

- Buildings
- Equipments
- Knowledge and competence
- Human background

... other elements are under construction.

Role of small scale infrastructures
An example of interdisciplinary networks



Outlook – train system vs internet speed vs research infra