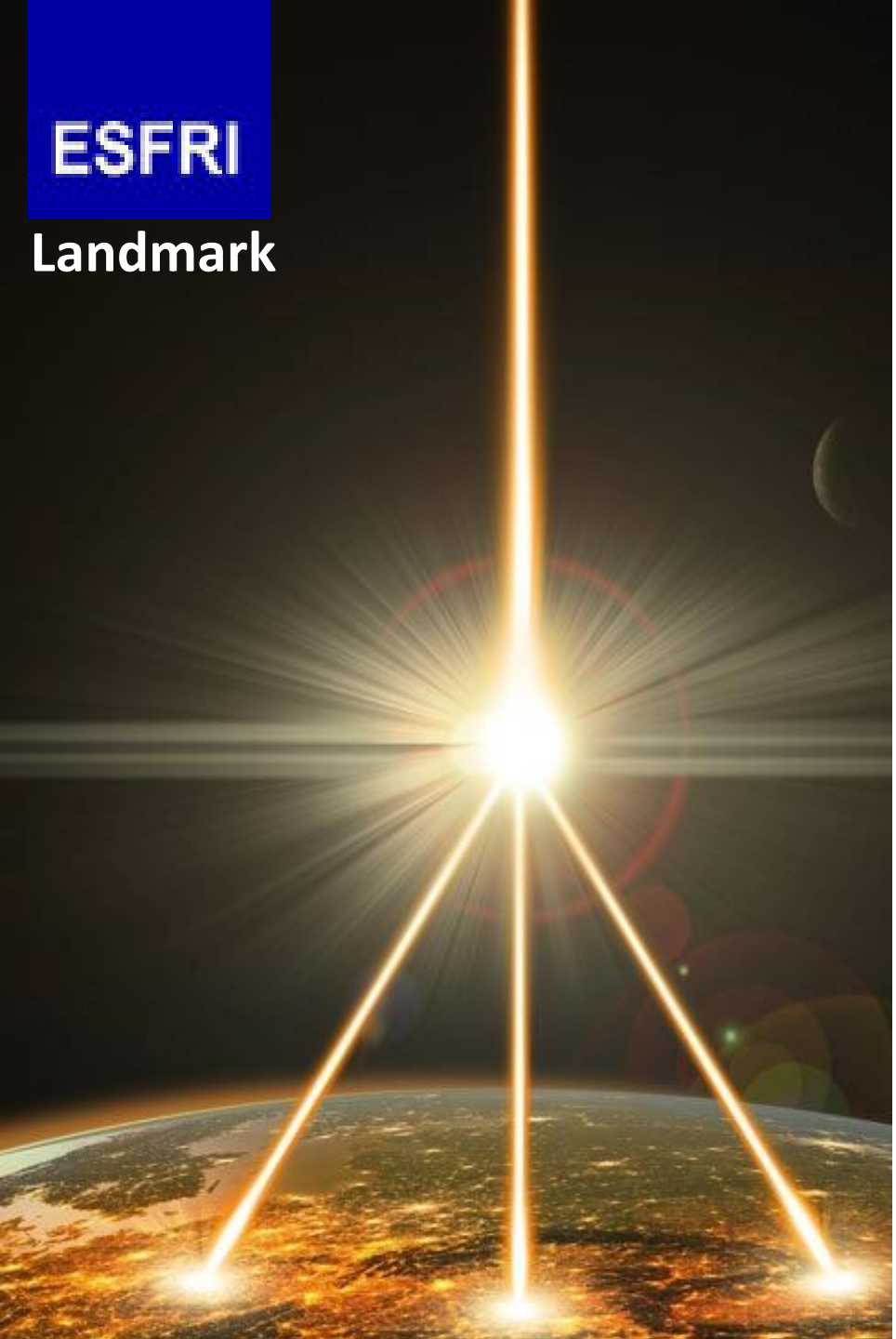
The ELI-ALPS project

ELI: Extreme Light Infrastructure
ALPS: Attosecond Light Pulse Source

Zsolt Fülöp

SZÉCHENYI 2020
HUNGARIAN GOVERNMENT
European Union
European Regional Development Fund
INVESTING IN YOUR FUTURE



ESFRI

Landmark

eli delivery consortium

World's most advanced **international laser research infrastructure**

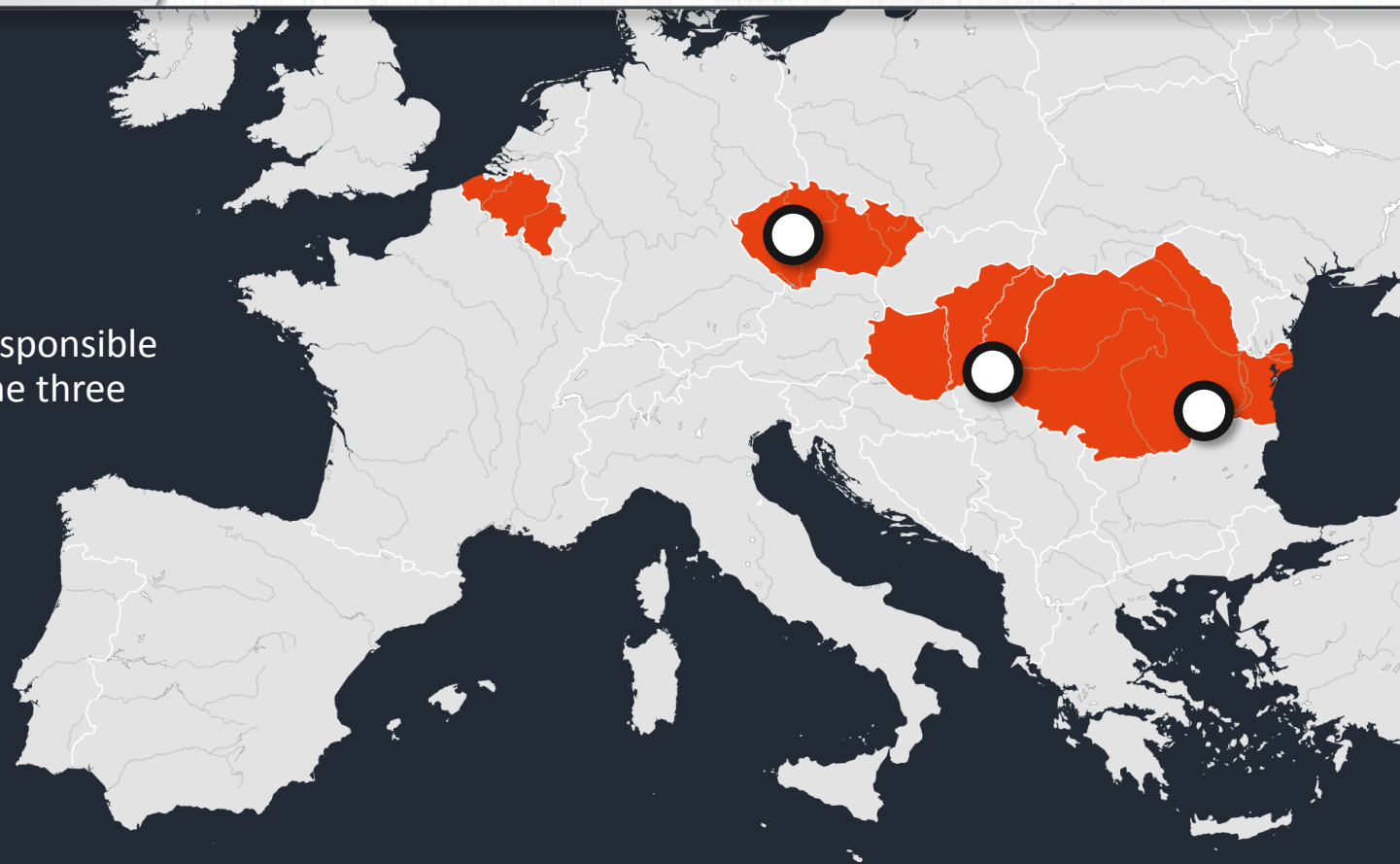
Selected by **ESFRI in 2006**

Funded between **ESIF, National and Framework** funds, after international site selection, and **EU approval**

First **multi-site research infrastructure** built completely in **Central Europe.**

…**In time and within budget!**

The ELI sites



ELI-DC Brussels
The consortium that is responsible for the coordination of the three research centres during implementation

ELI-ALPS Szeged
Hungary
ultrashort laser pulses at high repetition rate

ELI-BL Dolny Brezany
Czech Republic
ultrashort x-ray generation, particle acceleration

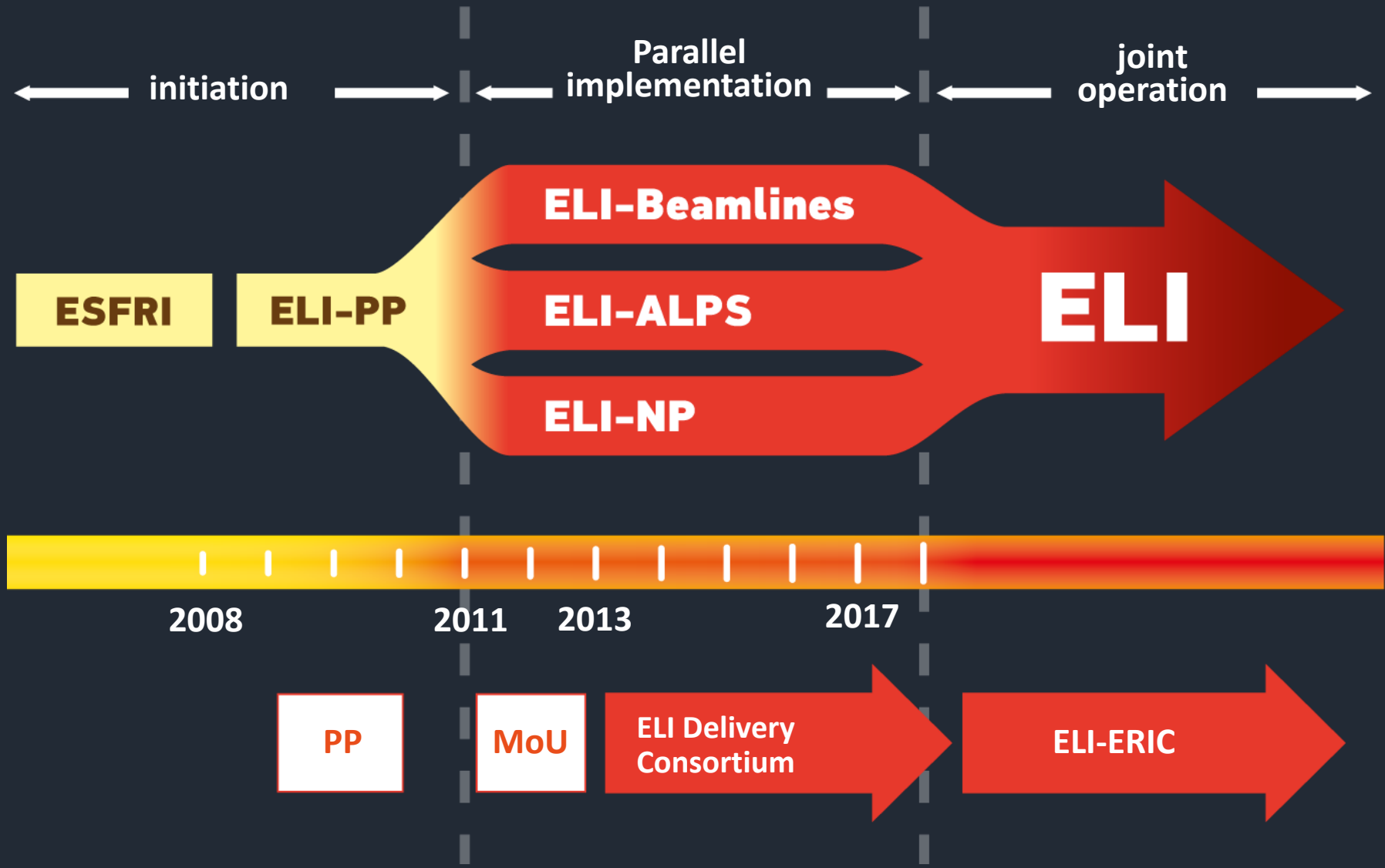
ELI-NP Magurele
Romania
ultra-intense optical and gamma ray pulses

ELI - beyond 2018

ELI will be

- the world's **first international laser user facility**, providing unique research opportunities for the future
  "The CERN of laser research"
- a **distributed research infrastructure** based initially on 3 facilities in the Czech Republic, Hungary and Romania
- the first ESFRI project to be **implemented in the new EU Member States**
- **pioneering a novel fuding model** combining structural funds (ERDF) for the implementation and contributions to an ERIC for the operation

ELI roadmap


initiation
Parallel implementation
joint operation
ESFRI
ELI-PP
ELI-Beamlines
ELI-ALPS
ELI-NP
ELI
2008
2011
2013
2017
PP
MoU
ELI Delivery Consortium
ELI-ERIC

ELI-ALPS, Szeged, Hungary

Location in Hungary

Szeged

Szeged, Southern Great Plain

- **Brownfield investment 100 / 10 ha**
- **165 km from Budapest on motorway M5**
- **5 km from the city centre**
- **Perfect transport connection on the motorway to the international airport**

Milestones of ELI-ALPS construction

- April 2014: construction begins
- March 2017: end of construction
- 23 May 2017: official inauguration
- 12 June 2017: moving in the new facility
- 9 November 2017: Grand scientific opening
- 12 February 2018: first pilot experiment

Missions of ELI-ALPS

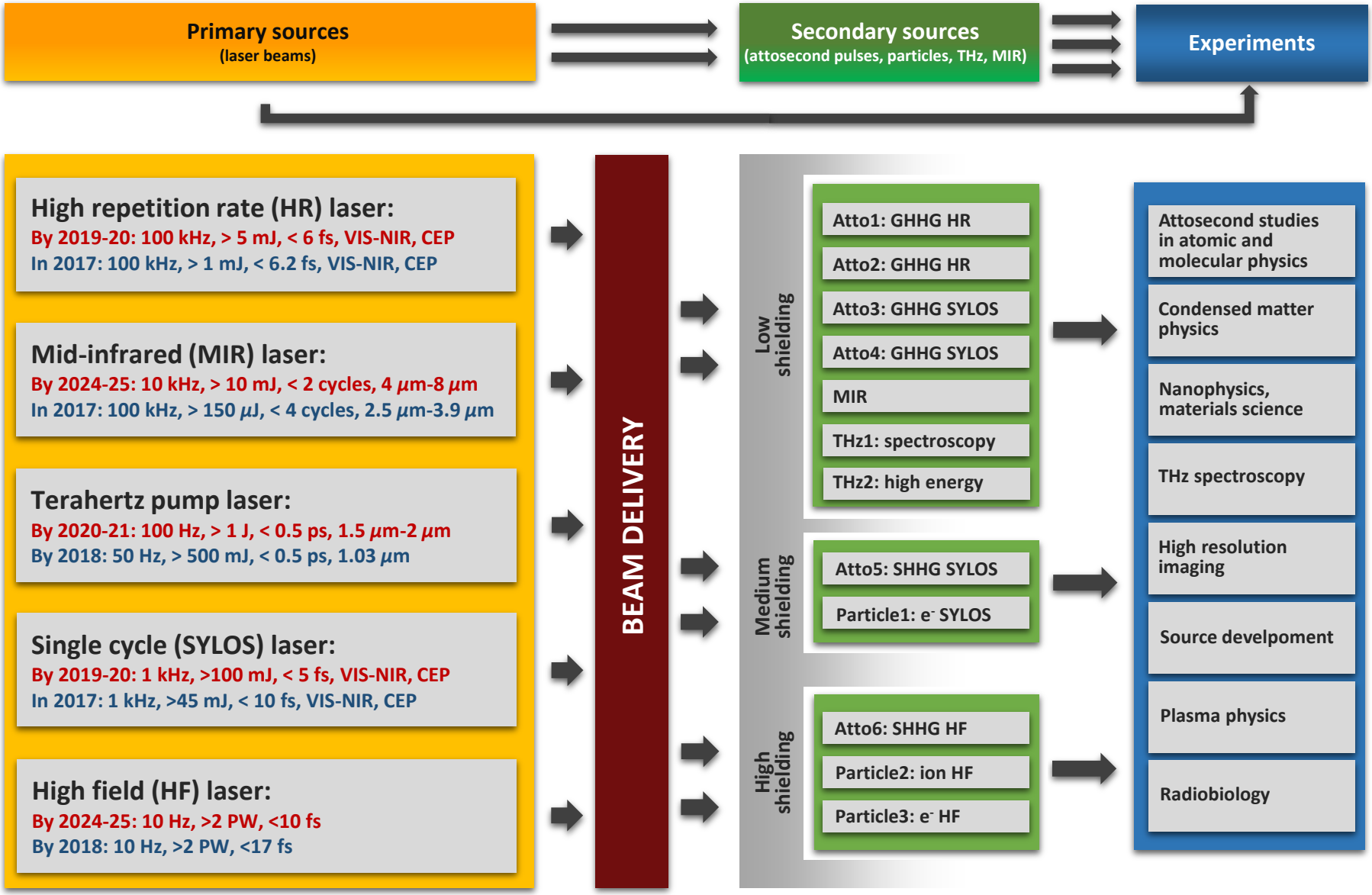
- To generate X-UV and X-ray femtosecond and attosecond pulses, for temporal investigation at the attosecond scale of electron dynamics in atoms, molecules, plasmas and solids.
- A user facility offering access to few cycle electromagnetic pulses (atto- and THz beamlines)
- To contribute to the technological development towards high average power, high peak intensity lasers.

Broad Scientific Program

- **Laser research and development**
- **Research and development of secondary sources**
- **Atomic, molecular and nanophysical research**
- **Applied research activities: biomedicine, materials science**
- **Industrial applications**

ELI-ALPS: Scientific Advisory Committee
ELI: International Scientific and Technical Advisory Committee

SCHEMATICS OF ELI-ALPS

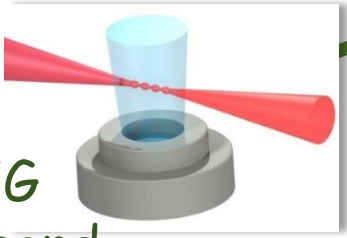


ELI-ALPS: collection of sources

Primary sources (laser pulses)

Secondary sources (harmonics, particles, THz, etc.)

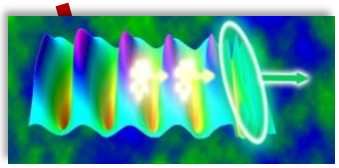
Experiment / User stations



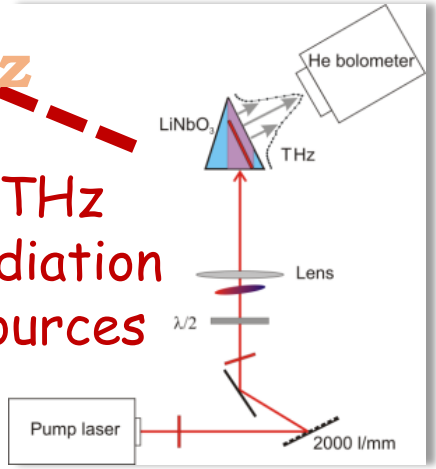
GHHG attosecond sources

Attosecond Sources

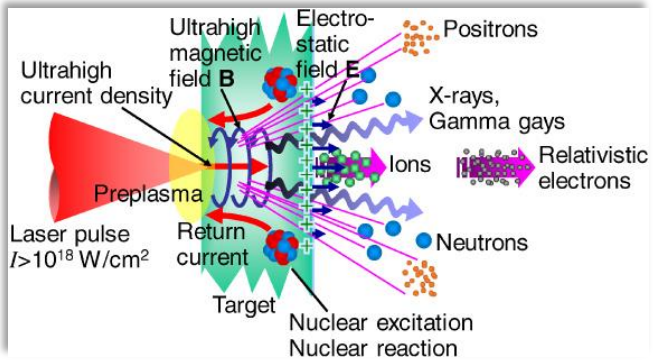
Particle and THz Sources



THz radiation sources

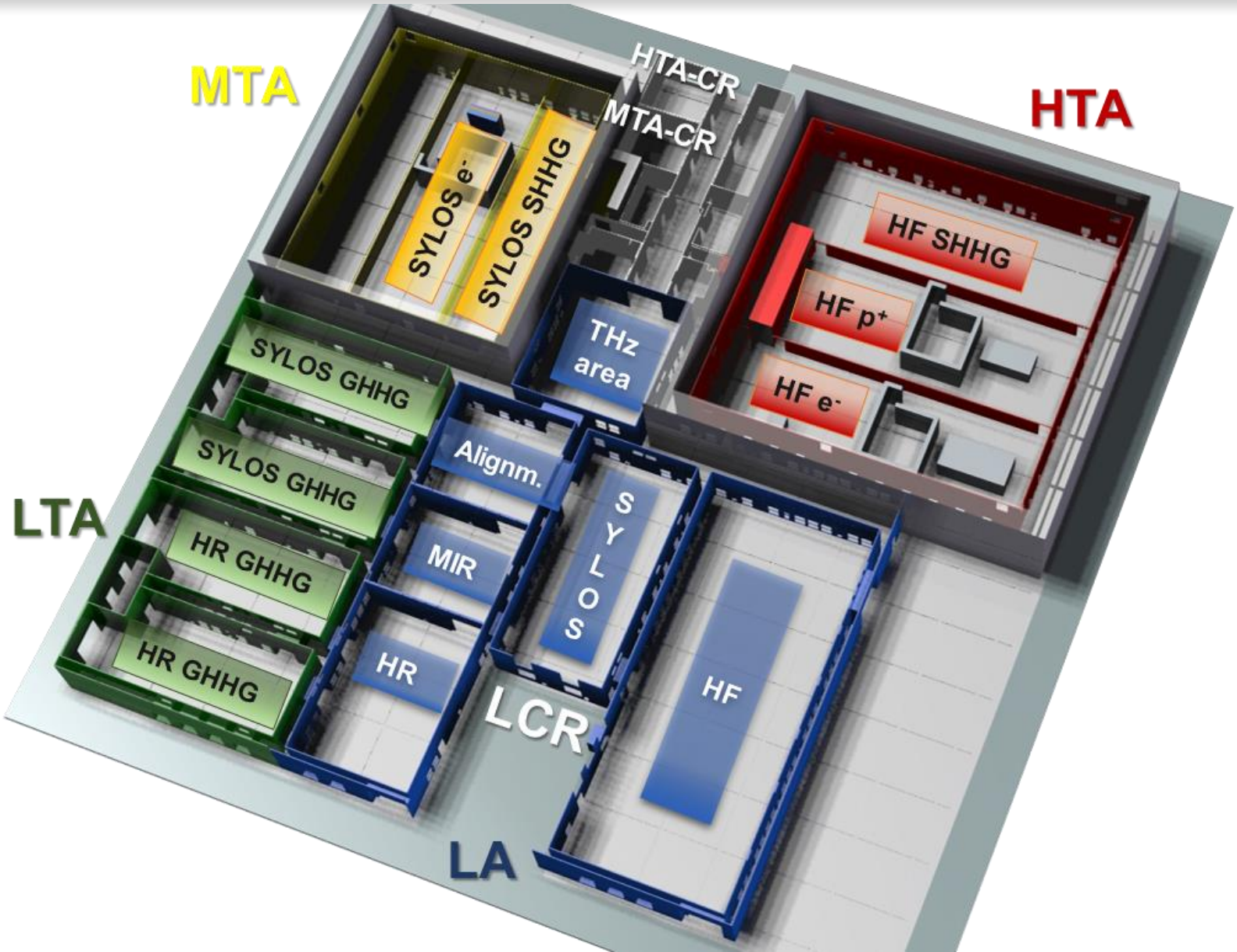


SHHG attosecond sources



Electron, ion accelerators

FLOOR PLAN
Main experimental building (A)



Full range of supporting labs

Mechanical and electrical workshops

Optical preparation laboratory

Optical workshop

Chemical, medical and radiobiological labs are under installation

USER ACCESS

Commissioning users

Expert users in a field
Part of commissioning, testing.
For equipment has just been installed
Full time operation is not guaranteed.
Upon collaboration agreements
Discretion of ELI-ALPS scientific management

”Zeroth call” users

(call to be launched in 2018 by ELI-DC/ERIC)

For selected, user ready equipment (HR1, MIR, THzSp)
Full time operation is on a best effort basis.
Based on scientific merit – international peer-review committee

Regular users

For the user ready equipment
Full time operation is guaranteed.
Based on scientific merit – international peer-review committee

”National” users

As above, but a dedicated time slot up to 20% of the beam time.
MUST go through peer review!

ELI ERIC

- An ERIC is a legal entity set up by a decision of the European Commission. It has legal personality and full legal capacity recognized in all EU Member States.

- ERICs are not be bound by the procedures of the Public Procurement Directive but may set their own procurement rules based on transparency, non-discrimination and competition

- Statutory seat in a Member State or Associated Country; research locations anywhere

- Members' liability:
  - limited to committed contribution (cash, in-kind)
  - may specify in the Statutes a fixed liability above their respective contributions or unlimited liability.

First working day in the facility– 12 June 2017

THANK YOU FOR YOUR ATTENTION!

SZÉCHENYI 2020
HUNGARIAN GOVERNMENT
European Union
European Regional Development Fund
INVESTING IN YOUR FUTURE