

# Extreme Light Infrastructure (ELI)

The ELI – Extreme Light Infrastructure – or as it is commonly referred to: the SUPERLASER will be one of the large research facilities of the European Union. Through this, the first structure in the world for studying the interaction between light and matter with ultrahigh intensity laser will be created with Hungarian cooperation. The most significant centre for attosecond pulse light research will operate in Szeged, the administrative centre for the county of Csongrád.

The ELI project intends with a trans-European cooperation the construction of a research super-laser with ultra-short pulses, which has considerably higher power density than the largest laser currently in existence and is of extreme scientific importance. It is one of the significant large facilities included in the European Strategic Forum on Research Infrastructures (ESFRI Roadmap: <http://cordis.europa.eu/esfri/>).

The ELI will be the first facility in the world to enable the investigation of the interaction between light and matter with the highest intensity, in the so called ultra-relativistic range. It will open a doorway into new territories within physics as well as establishing such new technical developments as relativistic microelectronics and small laser particle accelerators. The ELI will have a considerable impact on numerous fields of material sciences, medicine and environment protection.

The government is providing support for the innovative project to be implemented in Szeged amongst National Programmes within the framework of the New Széchenyi Plan. Due to its key significance the implementation will be directly supervised by the Ministry of National Development. The National Programmes of the New Széchenyi Plan include large projects resulting in considerable benefits to the Union and take account of all regions. We backed the ELI programme with the hope and the definite idea that it could become the engine for significant regional economic and social developments.

The ELI- programme reflects the spirit expressed in the New Széchenyi Plan: the cooperation of the Hungarian scientific and economic sphere is essential for the successful operation of the research base. The key return of the project is the knowledge transfer, which could develop the region into an economic, innovative and scientific centre.

The programme that will be implemented in a European cooperation will not end with the completion of the facility and the international research centre: the ELI represents a huge opportunity for the Hungarian and international scientific world, potentially influencing higher education in Hungary and having a beneficial effect on the economy in the Szeged region – including cross-border areas with Serbia and Romania.

## The building site for the facility

Besides Hungary, the Czech Republic, France, Great Britain and Romania also applied to build the facility. After careful consideration, the management of the preparatory project made the final decision on 1 October 2010 to have the ELI built on three sites focusing on slightly differing but complementing scientific programmes:

- In the Czech Republic, in Prague a laser technology and laser application centre
- In Hungary, in Szeged a centre focusing on short pulse laser technology and its applications
- In Romania, near Bucharest the emphasis is laid on photonuclear technology and its applications

With the three site solution, the scientific programme of ELI has widened. Each research centre site is planned to be built with approximately 250-280 M€ investment costs. In each laser centre, probably approximately 200-300 local and foreign specialists will work. According to the plans the activities of the sites will be coordinated by the European Research Infrastructure Consortium (ERIC), an international consortium based on the new legal framework of the European Union. The members shall include in addition to the three site-countries (the Czech Republic, Hungary and Romania), member states with a strong background in laser technology (primarily France, Great-Britain, Germany). The consortium will be open to other ELI-PP project partners, and later also to third countries.

The completion of the laser centre in Szeged will act as a magnet (stimulating force) for the technical-scientific development of Hungary and the competitiveness of the background industries, as well as strengthen the economy of the region. By becoming one of the regional centres of international scientific life it will be a contributory factor in attracting foreign experts and in the resettlement of Hungarian researchers.

More information: <http://www.eli-hu.hu/index>