



**of the European Community for research, technological
development and demonstration activities (2007-2013)**

Collaborative Project & Coordination and Support Action

ELI-PP

Project title: **Extreme Light Infrastructure Preparatory Phase**

Project number: **212105**

Project coordinator: **Centre National de la Recherche Scientifique CNRS,
Paris, France**

Project homepage: <http://www.extreme-light-infrastructure.eu/>

FZD participant: **Institute of Radiation Physics**

Starting date: **01.11.2007**

Duration (months): **36**

Summary

Among the most significant scientific inquiries defined by Science (July 2005) was whether or not scientists will be able to build a laser of intensity sufficient to “rip photons into electron-positron pairs”. ELI will be the first infrastructure to approach this limit, it represents the consensual effort of 13 European countries, more than 50 laboratories and numerous international collaborators. Dedicated to the fundamental study of laser-matter interaction in a new and unsurpassed, “ultra-relativistic” regime, this facility will be based on an exawatt-class laser delivering ultra-short (down to fractions of attosecond) pulses at least 100 times more powerful than any other existing or planned.

ELI will strive to be a highly multidisciplinary platform with specialized laser, particle or radiation beam lines dedicated to wide scientific fields, from fundamental ones: atomic, particle, nuclear, gravitational, and cosmology, to special ones. ELI will for instance benefit in life science, nanotechnology material science, or environment. ELI will finally foster technology transfers, as well as education and training.

The EU preparatory phase aims at establishing all the elements for the start of a successful construction and operation of the facility. It includes the technical studies that define within single safety guidelines, the laser and its experimental characteristics, leading into site selection issues. It examines the legal and governance networking elements that will ensure a stable and smooth operation. It allows steady evaluation of construction and operation costs, as well as decommissioning ones. This three years period will furthermore allow investigating new opportunities opened by the ultrarelativistic regime and consolidating the European users community and its international counterparts.