Contribution ID: **34** Type: **not specified**

High Power Laser Science at the Extreme Light Infrastructure ELI

Thursday 27 June 2013 11:00 (10 minutes)

The Extreme Light Infrastructure ELI will be the world's first international user facility for the scientific laser community. It is part of the ESFRI Roadmap for Pan-European Research Infrastructures of high priority, and it is presently being constructed as a de-centralized facility in the Czech Republic, Hungary and Romania. ELI will be instrumental for establishing and exploiting new scientific communities in the host countries and their neighbouring regions, apart from being open to access by an international user community. ELI's innovative funding model utilizes European Regional Development Funds (ERDF) for construction, and –most likely – an European Research Infrastructure Consortium (ERIC) of participating countries for operation. Investment costs are presently estimated at about 850 M€, not including ELI's yet to be decided fourth pillar.

The recently founded ELI-DC International Association will promote the sustainable development of ELI as a unified pan-European research infrastructure, support the coordinated implementation of the ELI research facilities, and preserve the consistency and complementarity of their scientific missions. It will also organise the establishment of the international ERIC consortium in charge of the future operation of ELI. The Association is open to membership from interested countries.

ELI will be dedicated to the fundamental study of laser-matter interaction in the intensity regime I > 1023 W/cm2 , and even higher in ELI's forthcoming fourth pillar. Technology is based on chirped pulse amplification of fs optical pulses in broadband solid-state laser materials and (or) nonlinear crystals. Single laser beam peak-power will exceed 10 PW, diode pumping will allow for up to 10Hz operation at the multi-PW level. Most of these specifications are at least one order of magnitude above today's top values.

Besides studying fundamental effects of ultra-strong electro-magnetic forces associated with such intensities ELI will serve to investigate a new generation of compact secondary sources delivering particle and radiation beams of femtosecond to attosecond duration at high energies. In this respect, ELI welcomes the ICAN initiative to develop new technologies for even higher average powers of high-power laser systems, which may become the next generation of drivers for novel secondary sources.

Author: GLIKSOHN, Florian (ELI-DC AISBL)

Presenter: GLIKSOHN, Florian (ELI-DC AISBL)

Session Classification: Project Overview & Background