



ELI will be an European Research Infrastructure for high-level research on ultra-high intensity lasers and laser-matter interaction comprising 4 pillars:

- ELI – Attoseconds in Szeged (Hungary);
- ELI – Beamlines in Prague (Czech Republic);
- ELI – Nuclear Physics in Magurele (Romania);
- ELI – High Fields (to be decided in 2012).

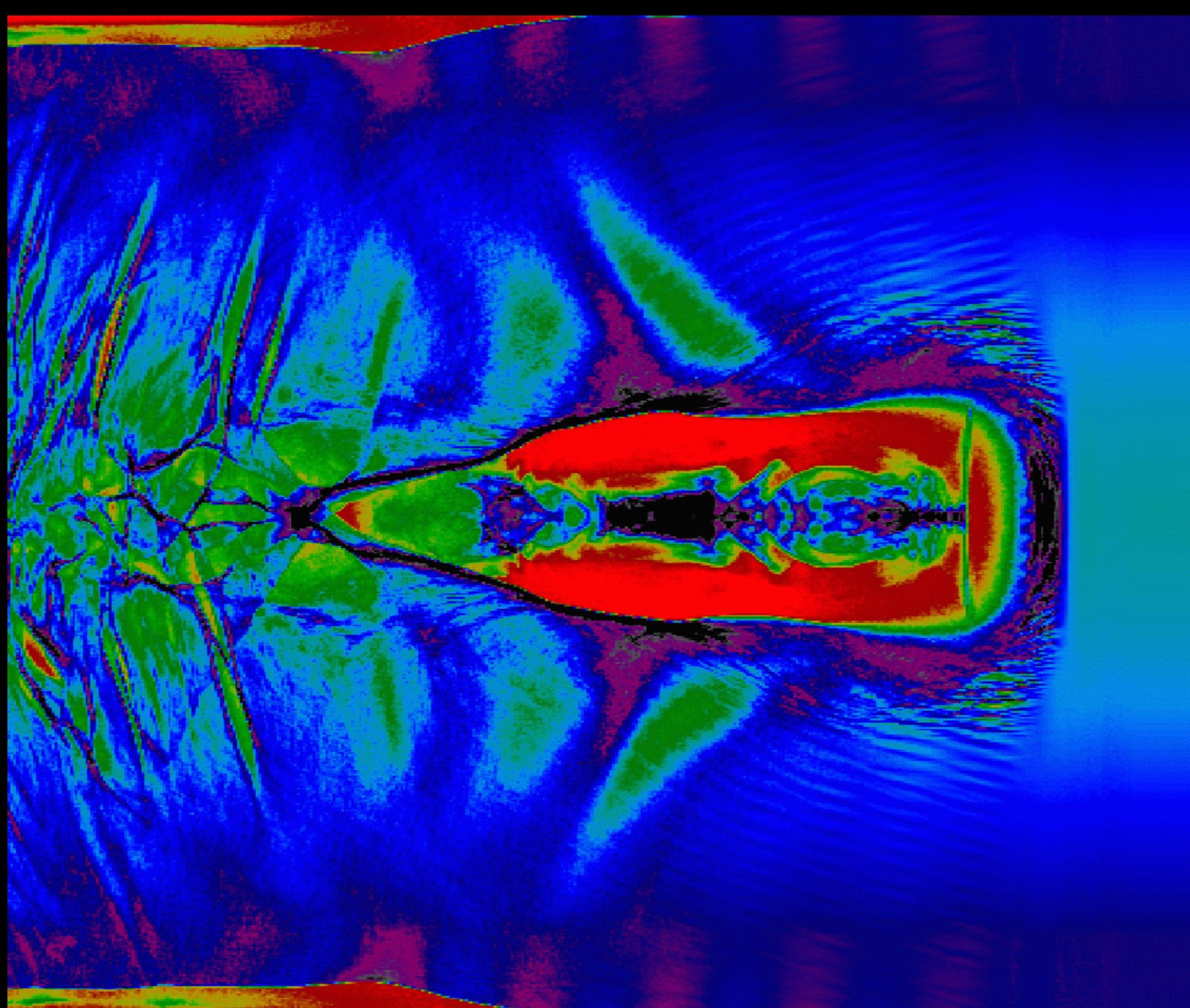
The cost of ELI-NP project is 293 M€.

The funding of the first phase (namely 180 M€) has been approved by the European Commission on September 18, 2012 from Structural Funds.

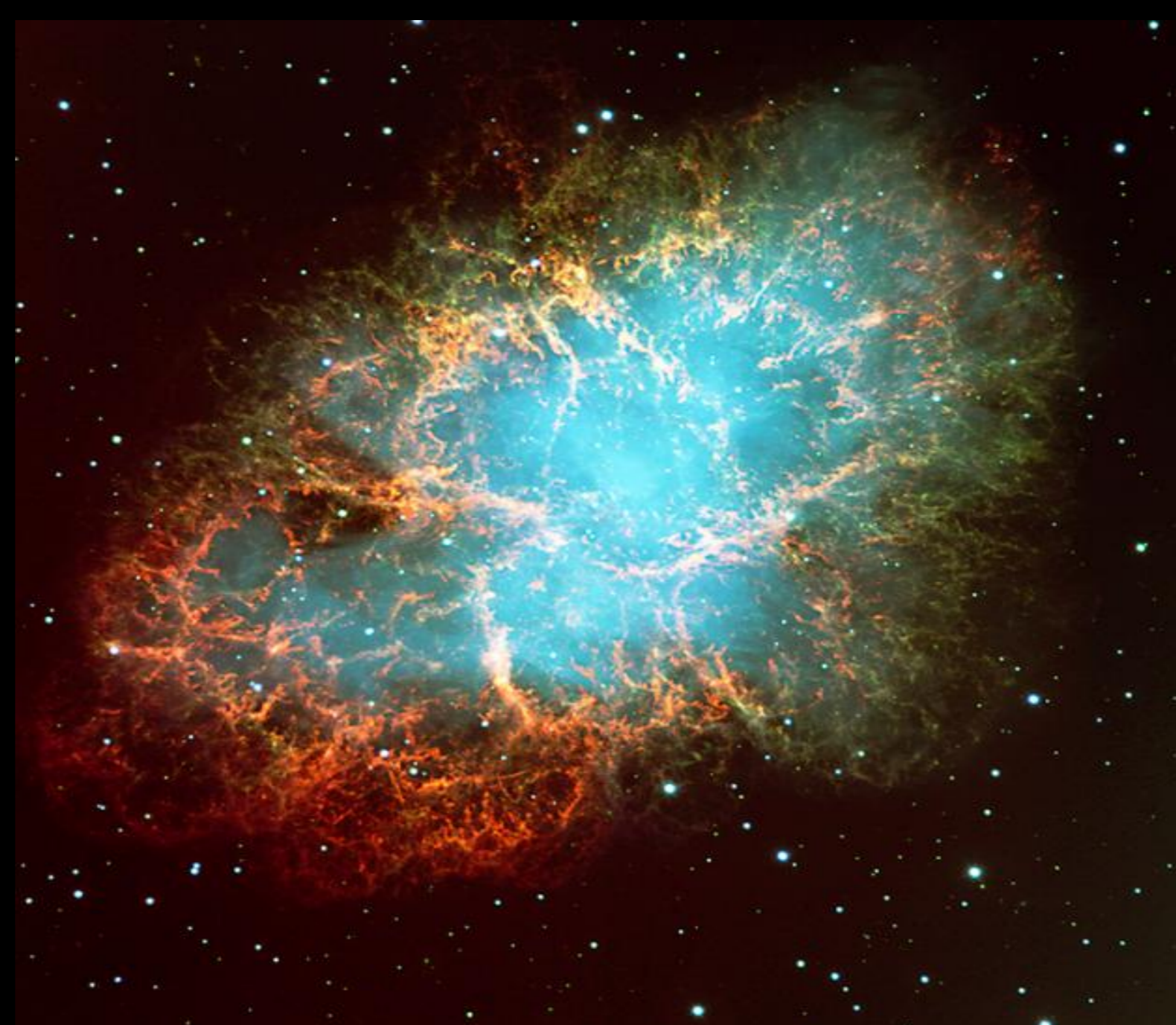
This facility shall provide till 2017 50 PhD and 107 post doc/junior researcher positions out of a total of 218 research positions.

Fundamental research: 3 types of experiments

to be carried out with the two synchronized arms of 10 PW (200 J/20 fs) Apollon type laser @ 0.02 Hz repetition rate with OPCPA Front End providing 10^{24} W/cm² and the gamma source with peak brilliance $>10^{21}$ γ /s/mm²/mrad²/(0.1% BW) with 2 ps pulse duration, 10^{-3} $\Delta E/E$ γ BW resulting from the interaction of 10 J laser & 600 MeV linac (scatter of light photons on the high energy e^-)



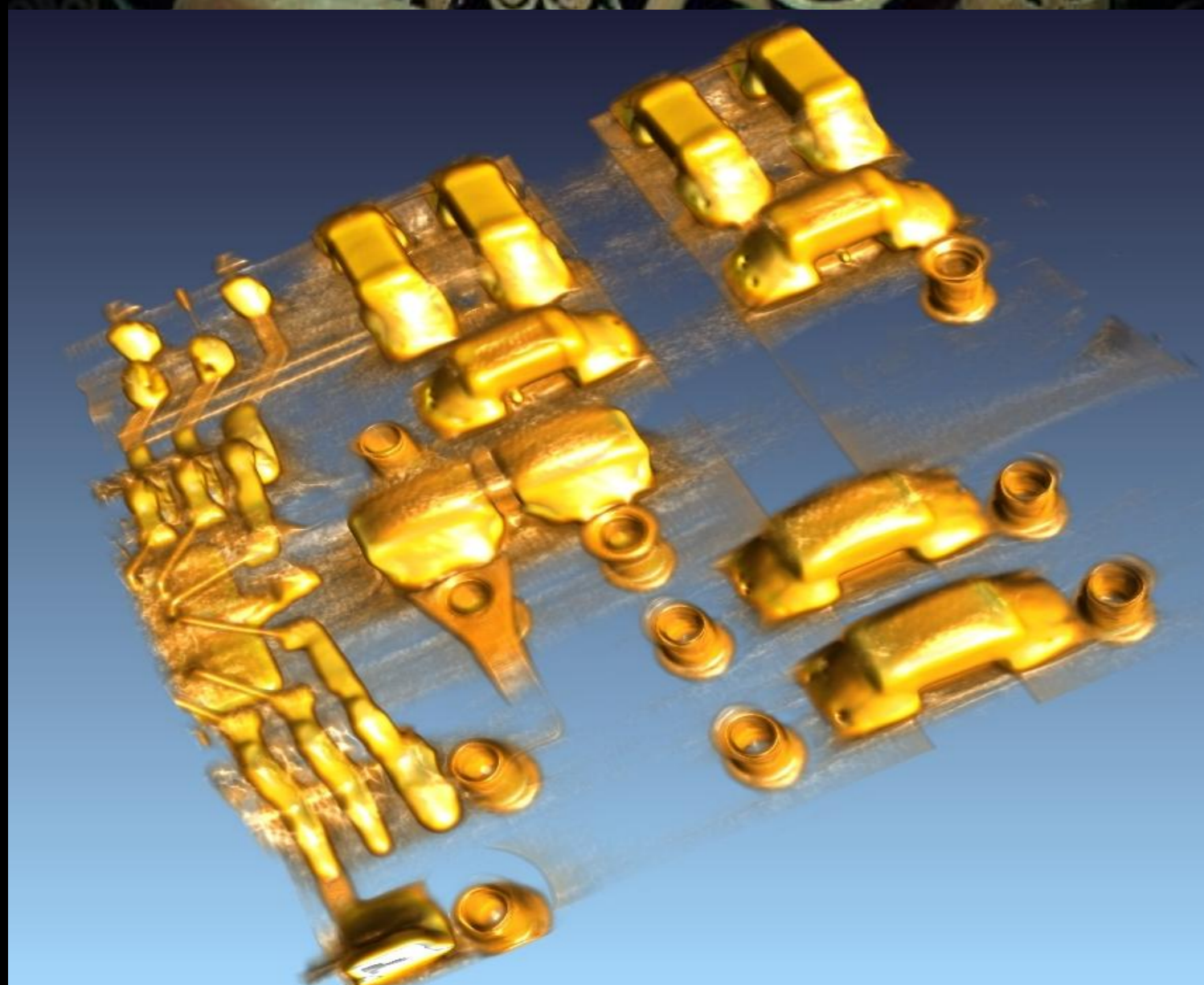
Apollon type laser stand alone experiments, such as the laser driven acceleration mechanism



Stand alone gamma/electron beam experiments, e.g. cross section measurements for nucleosynthesis in astrophysics



Experiments with Apollon type laser and gamma/electron beams, such as particle creation in vacuum



Applications

Various stand alone or combined experiments for a great variety of applications, such as radioactive materials management (upper left), production of radioisotopes for nuclear medicine (upper right) industrial tomography (left), materials/organisms under extreme irradiation (right), and many others in different fields, from medical to industrial use or energetic purposes.

