

Nuclear Science and Applications with Next Generation of High Power Lasers and Brilliant Low Energy Gamma Beams at ELI-NP

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The development of high power lasers and the combination of such novel devices with accelerator technology has enlarged the science reach of many research fields, in particular High energy, Nuclear and Astrophysics as well as societal applications in Material Science, Nuclear Energy and Medicine.

The European Strategic Forum for Research Infrastructures (ESFRI) has selected a proposal based on these new premises called “ELI” for Extreme Light Infrastructure. ELI will be built as a network of three complementary pillars at the frontier of laser technologies. The ELI-NP pillar (NP for Nuclear Physics) is under construction near Bucharest (Romania) and will develop a scientific program using two 10 PW class lasers and a Back Compton Scattering High Brilliance and Intense Low Energy Gamma Beam (0.5 to 19 MeV) produced by High Energy (720 MeV) electron linear C-Band accelerator, a marriage of Laser and Accelerator technology at the frontier of knowledge. In the present paper, the technical description of the facility, the present status of the project as well as the science, applications and future perspectives will be discussed.

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