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Advances @ ELI Beamlines: Status of user facility development

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An overview on the development of the “ELI-Beamline facility” being built within the Extreme Light Infrastructure (ELI) project based on the European Strategy Forum on Research Infrastructures process. ELI-Beamlines will be a high-energy, repetition-rate laser pillar of the ELI (Extreme Light Infrastructure) project. The main objective of the ELI-Beamlines Project is the delivery of ultra-intense high-energy pulses for high field experiments and the generation and applications of high-brightness X-ray sources and accelerated particles. The different laser systems will be delivering pulses with length ranging between 10 fs and 150 fs and will provide high-energy Petawatt and 10-PW peak powers. Two lasers will be available: 1. A 10 Hz, 1 PW (30fs) laser using as the active medium Ti:sapphire with a new gas cooled diode pumped Nd doped Glass pump laser and 2. A mixed Nd doped glass laser with 1.5 kJ in 150fs and an enhanced repetition rate. The lasers will be able to provide focused intensities attaining $>10^{22-23} \text{ Wcm}^{-2}$, while this value will might be increased in a later phase without the need to upgrade the building infrastructure using nonlinear compression schemes and relativistic plasma mirror investigation to go to the ultra-relativistic interaction regime above 10^{24} Wcm^{-2} and higher.

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