

Apollon multi-PW laser facility: Presentation and Scientific Program

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Designed in collaboration between CNRS, CEA, Ecole Polytechnique, the Paris Saclay University and their industrial partners, the upcoming “Apollon” laser facility on the plateau of Saclay, South of Paris (France), is expected to reach for the first the 10 Petawatt power level. At the heart of the opportunities offered by the facility will be compact particle acceleration, in particular testing new schemes for future generations of high-energy accelerators, but also a wide range of other applications, from the generation of highly energetic radiation that can complement what is produced on the latest generation X-ray sources, or the production of high-energy-density matter states, allowing e.g. laboratory investigation of extreme astrophysical phenomena. The facility will comprise two short-pulse laser beams (F1 at 10 PW nominal, with a first step at 5 PW, and F2 at 1 Pw, both at 15 fs duration), a chirped laser pulse (up to 250 J, 1 ns) and a probe beam (up to 100 mJ, 20fs minimum), all available at a repetition rate of one shot per minute at full power and in stable manner. Two target areas will be serviced by these laser beams in alternate mode: LFA, dedicated to long-focal length focusing experiments, and SFA, dedicated to short-focusing ($f/2.5$) and development of the highest intensity on target. The facility will be open to users following the current access mode of the LULI facilities (ELFIE, LULI2000), i.e. to Europe as well as international users.

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