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The ZEUS laser user facility

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The Zettawatt Equivalent Ultrashort pulse laser System (ZEUS) is a National Science Foundation-funded user facility housed at the University of Michigan. The laser will be capable of producing 3-Petawatt pulses, or may be split to create synchronized 2.5-PW and 0.5-PW pulses. The first user experiments are due to begin in late 2023. This presentation will describe the different capabilities of the facility available to users in each of the three target areas and the current laser status. Target Area 1 has a very long focal-length optic, ideal for laser wakefield acceleration (LWFA) of electron beams, and can accommodate dual pulse, including colliding beam experiments. Target Area 2 houses short focal-length optics and a dual plasma mirror set-up to achieve the highest intensity and best pre-pulse contrast. Target Area 3 accommodates up to 0.5-PW pulses, but at a higher repetition rate of 1-5 Hz burst modes and is suited to LWFA and betatron x-ray studies and applications. There will be a modest long-pulse capability available for pump-probe experiments.

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