**The University of Rochester’s Laboratory for Laser Energetics joins other Universities and National Laboratories in LaserNetUS, a New Nationwide High-Intensity Laser Network**

To help foster the broad applicability of high-intensity lasers, the University of Rochester’s Laboratory for Laser Energetics (UR/LLE) is partnering in a new national research network called LaserNetUS.

The new initiative is funded at $6.8 million over the next two years by the Department of Energy’s Office of Fusion Energy Sciences (FES) within the Office of Science and includes institutions nationwide operating high intensity, ultrafast lasers. LaserNetUS includes the most powerful lasers in the United States including lasers with powers approaching or exceeding a petawatt. LaserNetUS will provide U.S. scientists increased access to the unique high intensity laser facilities at nine institutions: the University of Texas at Austin, The Ohio State University, Colorado State University, The University of Michigan, University of Nebraska-Lincoln, University of Rochester, SLAC National Laboratory, Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory.

High intensity lasers have a broad range of applications in basic research, manufacturing and medicine. For example, they can be used to recreate some of the most extreme conditions in the universe, such as those found in supernova explosions and near black holes. They can generate high energy particles for high energy physics research or intense x-ray pulses to probe matter as it evolves on ultrafast time scales. They are also promising in many potential technological areas such as for generating intense neutron bursts which could evaluate aging aircraft components, precisely cut materials or potentially deliver tightly focused radiation therapy to cancer tumors.

Petawatt lasers are lasers that generate light with at least a million billion watts of power, or nearly 100 times the output of all the world's power plants—but only in the briefest of bursts. Using a technology called chirped pulse amplification that was pioneered at the UR/LLE in 1980s by two winners of [this year's Nobel Prize in Physics](https://www.nytimes.com/2018/10/02/science/physics-nobel-prize.html), these lasers fire off ultrafast bursts of light shorter than a tenth of a trillionth of a second. The OMEGA EP laser at the UR/LLE is the only kilojoule-class high intensity laser in the LaserNetUS network.

The U.S. was the dominant innovator and user of high-intensity laser technology in the 1990s, but now Europe and Asia have taken the lead, according to a recent report from the National Academies of Sciences, Engineering and Medicine titled "[Opportunities in Intense Ultrafast Lasers: Reaching for the Brightest Light](https://www.nap.edu/catalog/24939/opportunities-in-intense-ultrafast-lasers-reaching-for-the-brightest-light)." Currently, 80 to 90 percent of the world's high-intensity ultrafast laser systems are overseas, and all of the highest power research lasers currently in construction or already built are also overseas. The report's authors recommended establishing a national network of laser facilities to emulate successful efforts in Europe. LaserNetUS was established for exactly that purpose.

LaserNetUS will hold a nationwide call for proposals for access to the network's facilities. The proposals will be peer reviewed by an independent proposal review panel. This call will allow any researcher in the U.S. to get time on one of the high intensity lasers at the LaserNetUS host institutions.

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Established in 1970 as a center for the investigation of the interaction of intense radiation with matter, the Laboratory for Laser Energetics of the University of Rochester is a unique national resource for research and education in science and technology. The Omega Laser Facility funded by the National Nuclear Security Administration (NNSA) and operated by the UR/LLE is the largest university-based laser facility in the world. The high-energy and high-intensity OMEGA EP laser system with over a decade experience supporting the NNSA’s science-based Stockpile Stewardship including external academic research, will bring unique energy, intensity, versatility, reliability and diagnostic capability to the LaserNetUS network. For more, visit www.lle.rochester.edu