

OMEGA's 100,000th Shot

Shot number 100,000 is a historic marker of the productivity and longevity of the OMEGA Laser System. Originally commissioned in 1995, the OMEGA shot counter has cycled the "state machine" through all shot types from diagnostic timing test shots to target shots. The 100,000 shot cycles in 25 years equates to a rate of roughly 4,000 per year. While not all of these are for investigating the various elements of inertial confinement fusion or high-energy-density physics, this particular one marks the 33,374th target shot, which means that more than 33% of the total were for target physics. The balance of these on OMEGA are used for laser system shots to accomplish goals such as to balance the energy in the 60 beams, test intricately shaped pulses, and precision time various diagnostic instruments. The Omega Laser Facility is a unique national resource, and approximately 60% of the shot days are for external non-LLE users. It is therefore fitting that this milestone shot taken for Sasi Palaniyappan and his collaborators from Los Alamos National Laboratory conducting the CylDRT-21A Campaign. Shown is a view of the shot from port P2 inside the target chamber and a group photo of the operations team.



Matt Maslyn, Ben Stanley, Dan Neyland, Alyson Kittle, Tim Ilardo, *Kyle Boutin, Sean Carey, Doug Kelly, Liz Hill (Shot Director),* Dave Kuhn, Steve Engels, Brian Lee, Albert Consentino, Lyndsey Kamm, Sid Sampat, Carol Meyers, and Tory Hillenbrand

Record Fusion Yield for Direct-Drive Layered DT Implosions Achieved on OMEGA



Connor Williams, left, and his record-breaking target shot 100956

Connor Williams, a second year Ph.D. student in the Department of Physics and Astronomy at the University of Rochester, developed a novel laser-fusion target design to achieve the highest fusion yields to date on the OMEGA laser. Connor's target used an ~1.01-mm-diam, 7.5- μ m-thick plastic shell enclosing a cryogenic DT ice layer of several tens of microns and yielded over 300 trillion fusion reactions—a new facility fusion yield record.

Laboratory for Laser Energetics

LLE's Laser Technology Impact Extends **Beyond New York State**



DCS target chamber: designed to house samples under vacuum and facilitate time-resolved x-ray measurements of laser-driven compression

The Dynamic Compression Sector (DCS), operated by Washington State University and located at Argonne National Laboratory, conducted a review highlighting the progress in measurements to link atomic to continuum length scales in materials subjected to dynamic compression. This includes the development by DCS of a new capability that provides high-flux, narrowband x rays at 36 keV for diffraction—a first for dynamic compression science. The review praises the 100-J, 3ω laser with precision pulse shaping developed by Jon Zuegel and the Laser and Materials Technology Team at LLE.

a unique national resource

Dustin H. Froula Receives E. O. Lawrence Award



Dustin Froula, recipent of the E.O. Lawrence Award, and the certificate awarded to him

On 19 January 2021, Dr. Dustin H. Froula was presented with the Ernest Orlando Lawrence Award from Department of Energy Secretary Dan Brouillette for "seminal and creative contributions in fundamental laser-matter interaction physics, and laser-driven plasma accelerators that have significantly advanced the Department of Energy's mission, including pioneering spatiotemporal pulse shaping techniques, focused laser plasma instability research, and novel high-resolution Thomson scattering methods." The E. O. Lawrence Award honors scientists for their exceptional contributions in research and development in supporting the Department of Energy and its mission to advance the national, economic, and energy security of the United States.

The BEST Research Program for Rochester City Schools

The LLE Broad Exposure to Science and Technology (BEST) Research Program for high school students and teachers was held durring the summer of 2021 at East High, part of the Rochester City School District (RCSD). Examples of the many experimental activities can be seen on the TV screen shown here. These participants will serve as ambassadors of the research program as it expands within the RCSD.



East High teachers (from left to right) Trent Russell and Gavin Jenkins; East High students Yusuf Gazali, Reganae Walters, Taiasia Gibson, Ramir Wearen; and program coordinator Terry *Kessler, Senior Research Engineer and LLE Diversity Manager.*



