

## Cover Photos

Top left: Graduate students and postdocs receiving poster awards at the Tenth Annual Omega Laser Facility Users Group Workshop in April 2018. The Workshop was attended by 130 researchers from five countries including the U.S., Canada, U.K., France, and Israel.

Top center: An OMEGA Basic Science experiment led by Marius Millot with collaborators from Lawrence Livermore National Laboratory, University of California-Berkeley, and LLE confirmed a new “strange” form of water that is simultaneously solid and liquid. The result was published in the journal *Nature Physics* and featured in *The New York Times*.

Top right: A new transport system coupling the wavelength tunable OMEGA P9 beam (TOP9) using OMEGA EP Beamline 1 to the OMEGA target chamber for joint operations with the OMEGA 60-beam laser for focused laser–plasma interaction study, particularly to validate the modeling of cross-beam energy transfer.

Middle left: Two former LLE researchers, Profs. Donna Strickland and Gérard Mourou, were awarded the 2018 Nobel Prize in Physics “for groundbreaking inventions in the field of laser physics” for their invention of chirped-pulse amplification (CPA) while at LLE in the 1980s. As a graduate student, with

Prof. Mourou as her advisor, Prof. Strickland developed CPA at The Institute of Optics.

Middle right: Metallic hydrogen is one of the rarest materials on earth yet it makes up more than 80% of planets like Jupiter. Dr. Mohamed Zaghoo and Prof. Gilbert “Rip” Collins have studied the conductivity of metallic hydrogen using experiments on the OMEGA Laser System to understand how planets form magnetic fields.

Bottom left: Scientist Danae Polsin assembles a powder x-ray diffraction image-plate target for a Laboratory Basic Science experiment to study sodium in an unexplored pressure regime (5 million atmospheric pressure).

Bottom center: A schematic of the chromatic focusing system coupled to a spectrally chirped laser pulse used to generate “flying focus,” an advanced focusing scheme that was detailed in a *Nature Photonics* article with Prof. Dustin Froula as lead author.

Bottom right: Neutron yield versus areal density for OMEGA cryogenic implosions. Data from the July 2018 shots (as black circles) are the highest-performance direct-drive cryogenic implosions to date.

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