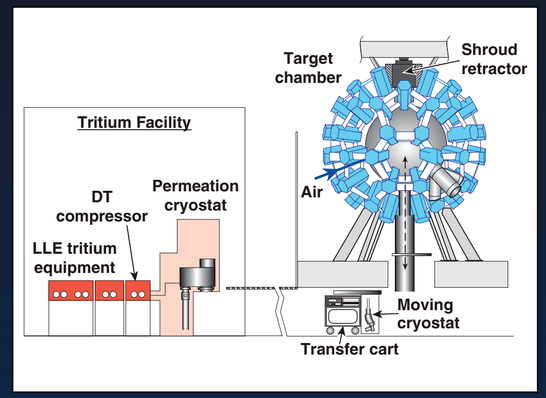
1992

OMEGA-24 Fires Its Last Shot

Dr. Robert McCrory and Terleta "T." Willis

At 5:09 pm on 18 December 1992, the last target shot was fired on the original 24-beam OMEGA laser. Operations of OMEGA, which had been operated in various configurations including 6-beam and 24-beam infrared and 24-beam ultraviolet and had been fired approximately 25,000 times since its first shot in 1978, were suspended to support the upgrade of OMEGA to a 60-beam, 30-kJ, UV laser. OMEGA was successfully upgraded on schedule and within budget and met or exceeded all its specifications.

Cryogenic Target Handling System



Schematic of the OMEGA Cryogenic Target Handling System

General Atomics, in collaboration with LLE and LANL, began work on designing a new cryogenic target handling system to support hydrodynamically equivalent cryogenic target experiments on OMEGA. These targets required very thick (~100-μm) DT layers in very thin (~a few microns) polymer containers, with extremely tight uniformity specifications. The key system requirements for the OMEGA Cryogenic Target Handling System (CTHS) were to fill as many as 12 targets per week at gas pressures as high as ~1500 atm, with cryogenic layer uniformity controlled with either beta layering or other D_2- or DT-ice smoothing techniques. The target had to be placed within 5 μm of target center, and the cryogenic protective shroud had to be retracted, in a predetermined manner, <100 ms prior to the shot. Work on this system began in 1992 and the initial design was completed and delivered to LLE in 1999.

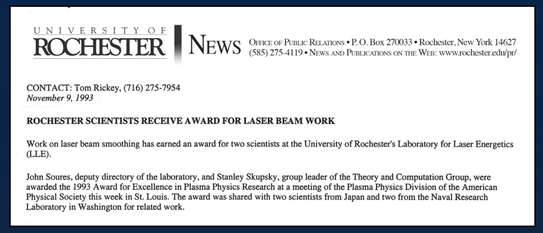
1993

Laser Construction Begins

OMEGA Laser construction and installation

In 1993, building modifications were completed and laser construction began. The OMEGA upgrade laser was designed to be a 60-beam ultraviolet laser with an energy-on-target capability of 30 kJ, and an eventual irradiation uniformity of 1% to 2% rms (root mean square). To maximize its experimental utility, the system was designed for at least one shot per hour. Approximately $61 million—about $2000 per UV joule—was budgeted for the laser construction.

Award for Excellence in Plasma Physics Research



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ROCHESTER SCIENTISTS RECEIVE AWARD FOR LASER BEAM WORK

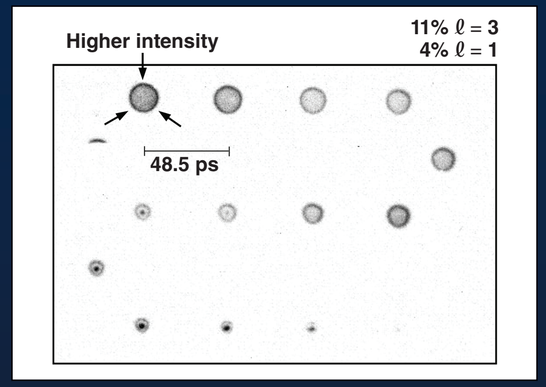
Work on laser beam smoothing has earned an award for two scientists at the University of Rochester's Laboratory for Laser Energetics (LLE).

John Soures, deputy directory of the laboratory, and Stanley Skupsky, group leader of the Theory and Computation Group, were awarded the 1993 Award for Excellence in Plasma Physics Research at a meeting of the Plasma Physics Division of the American Physical Society this week in St. Louis. The award was shared with two scientists from Japan and two from the Naval Research Laboratory in Washington for related work.

UR Press Release: Rochester Scientists Receive Award for Laser Beam Work

In recognition of the roles played by their respective teams in the innovation of laser-beam–smoothing techniques for inertial confinement fusion (ICF), the American Physical Society awarded the 1993 Award for Excellence in Plasma Physics Research to researchers from Osaka University in Japan, the U.S. Naval Research Laboratory, and Stanley Skupsky and John M. Soures from the Laboratory for Laser Energetics at the University of Rochester.

Inferring Camera with 40-ps Time Resolution



Development of x-ray framing camera with 40-ps time resolution (first prototype donated to and on display at George Eastman House)

Framing-camera image showing implosion of glass microballoon with intentionally applied drive nonuniformities in the $\ell = 1$ and $\ell = 3$ modes.