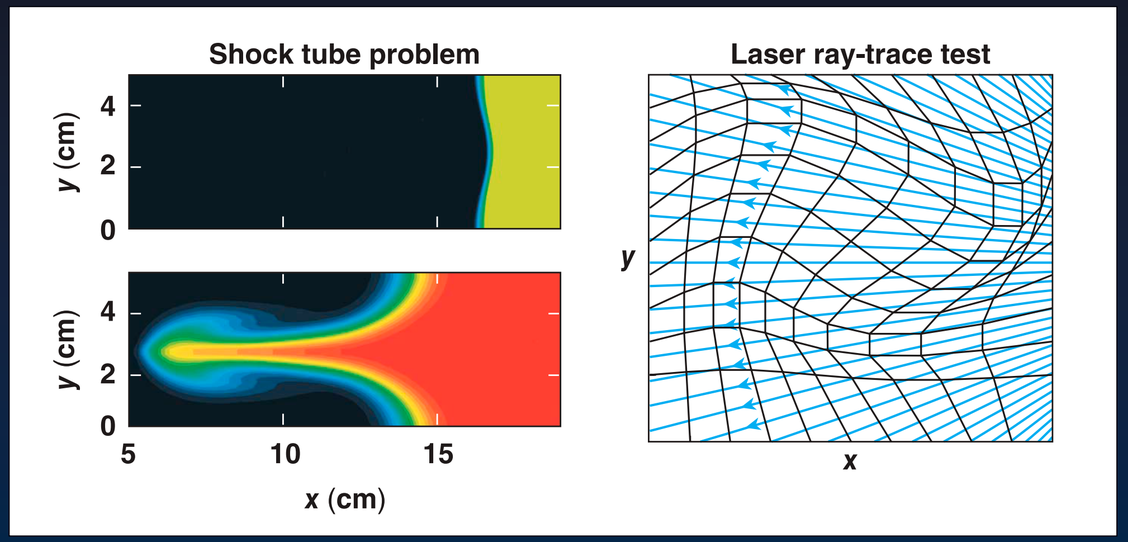
1997

Multidimensional Hydrodynamics Code *DRACO*



DRACO *tests*

LLE began to develop a new multidimensional hydrodynamics code *DRACO*, which is now a workhorse at the Laboratory and can run one-, two-, and three-dimensional simulations using an arbitrary Lagrangian–Eulerian hydrodynamics formulation and, where possible, common physics routines.

High-Bandwidth Frequency Tripling

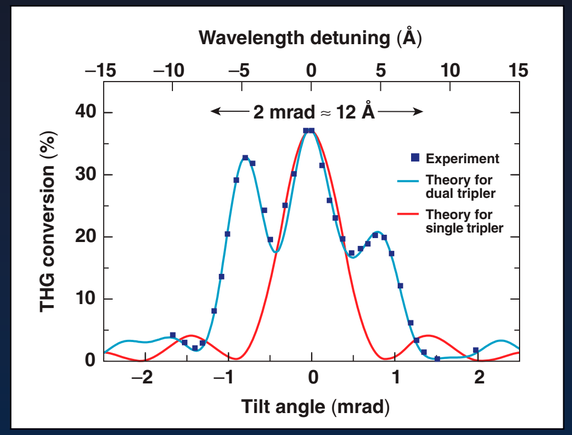
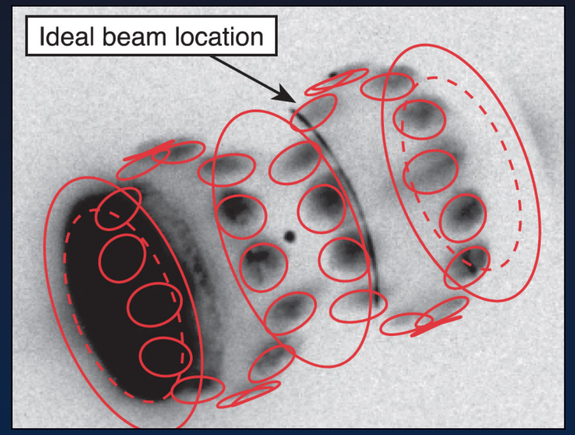


Figure demonstrating high-bandwidth frequency tripling

LLE implemented high-bandwidth frequency tripling on the OMEGA laser.

Multibeam-Phasing Configuration



Multibeam-phasing configuration

The first experiments using a "NIF-like multibeam phasing" configuration on hohlraum targets were conducted on OMEGA

Indirect-Drive and Stockpile Stewardship Support

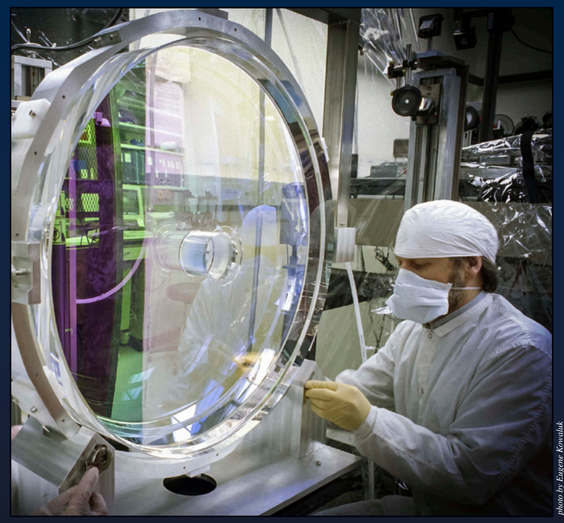
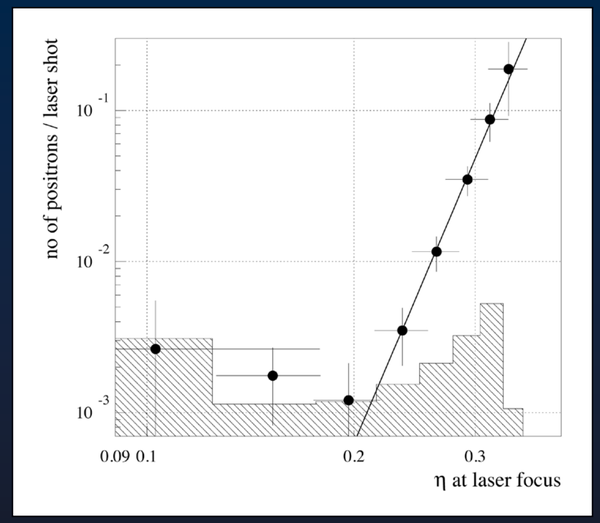


photo by Eugene Kowalak

◀ *Final focusing parabola for the LLNL Petawatt Laser is prepared for final photometric testing in LLE's OMAN Shop (Doug Smith)*

The final focusing parabola for the LLNL Petawatt Laser is prepared for the last photometric testing of the optical thin-film coating. The parabola was coated with a high-damage-threshold, high-reflectivity coating by the Optical Manufacturing Group at LLE in a collaboration with LLNL on new laser technologies. The parabola was installed into the LLNL Nova chamber for petawatt experiments in the summer of 1997.

Positron Production in Multiphoton Scattering



◀ *Dependence of the positron rate per laser shot on the laser-field-strength parameter η*

"Positron Production in Multiphoton Light-by-Light Scattering" was published in Physical Review Letters. The work was the result of a multi-institutional collaboration that made use of an LLE-developed laser source on the Stanford Linear Accelerator Center (SLAC) to provide the first laboratory evidence for inelastic light-by-light scattering involving only real photons.

D. L. Burke, R. C. Field, G. Horton-Smith, J. E. Spencer, D. Walz, S. C. Berridge, W. M. Bugg, K. Shmakov, A. W. Weidemann, C. Bula, K. T. McDonald, E. J. Prebys, C. Bamber, S. J. Boege, T. Koffas, T. Kotseroglou, A. C. Melissinos, D. D. Meyerhofer, D. A. Reis, and W. Ragg, "Positron Production in Multiphoton Light-by-Light Scattering," Phys. Rev. Lett. **79** *(9), 1626–1629 (1998).*