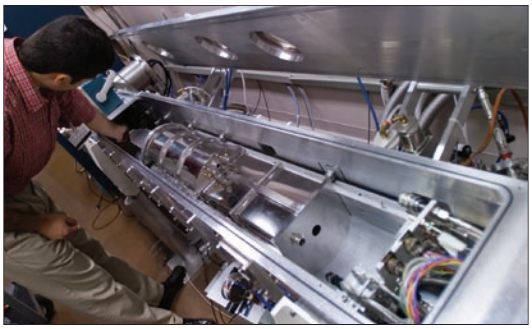
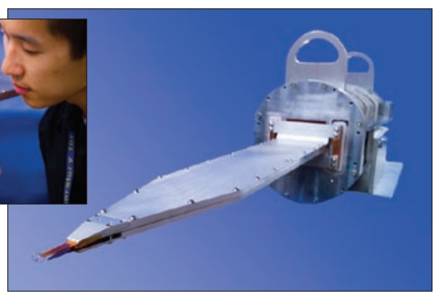
About the Cover:

A Helmholtz-type, single-turn coil (shown on the cover) provides the seed field in which the laser target is immersed during laser-driven, magnetic-flux-compression experiments on OMEGA. In these experiments, 40 OMEGA beams compress an 860-μm-diam, cylindrical CH shell (in the center of this photo) filled with D_2 gas. It is expected that in the process, the seed magnetic field will be trapped and amplified by the highly conductive converging plasma. The dimensions of the coil are optimized for the beam irradiation geometry of the experiment. Magnetic-flux compression with lasers is expected to facilitate implosions where megagauss fields will—by inhibiting the electron thermal transport—reduce the thermal losses out of the hot spot. This can provide for implosions with higher gain (or lower-ignition-energy requirements) than what is possible with conventional ICF. The generation of super-strong magnetic fields can also be used in a variety of nonfusion experiments such as laboratory astrophysics, material science, etc.





The top photo on the left shows the magneto-inertial fusion energy delivery system (MIFEDS) that is being tested in the diagnostic TIM (ten-inch manipulator) facility. MIFEDS, a 10-T magnetic-pulse generator, is the main piece of enabling technology for laser-driven, magnetic-flux-compression experiments. Two members of the magneto-inertial fusion (MIF) team—postdoctoral researcher Orlin Gotchev (left) and graduate student Neo Jang (both with the Department of Mechanical Engineering and LLE)—are preparing the device (inset) for upcoming experiments on OMEGA. The other TIM facility members include Professor Riccardo Betti (MIF project leader) and Dr. James Knauer (LLE senior scientist).

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