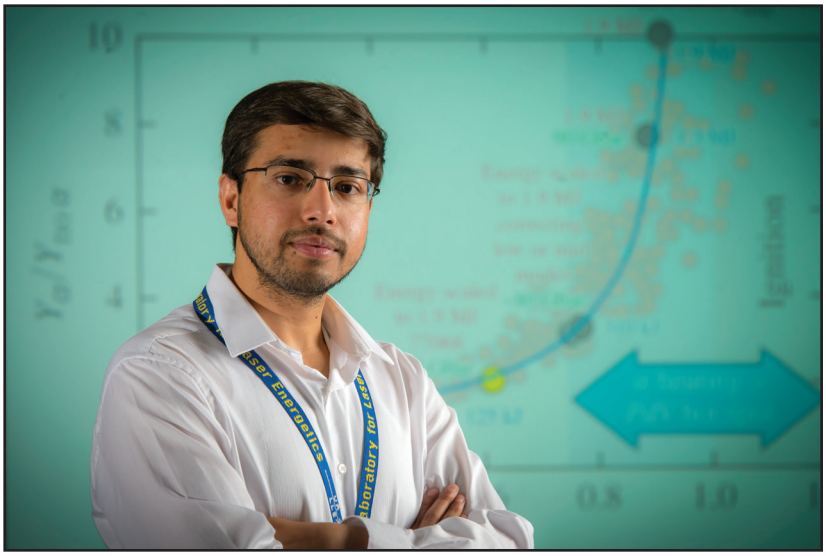
About the Cover:

The figure on the front cover illustrates that a combination of low- ($\ell < 6$) and mid-mode ($6 < \ell < 40$) asymmetries is necessary to reproduce and explain the experimental observables of high-convergence cryogenic implosions on OMEGA. The reconstructed simulation of high-performing shot 77068 is shown. It is expected that mid-mode asymmetries, such as $\ell = 10$, can be introduced by the overlapped intensity variation arising from the superposition of all 60 laser beams on OMEGA. A multi-objective analysis technique has been developed for investigating such systematic degradation mechanisms of an imploding core. This technique was applied to an ensemble of cryogenic DT implosions that generated hot-spot pressures of ~50 Gbar, which showed that a systematic and repeatable combination of modes is responsible for the observed performance degradation. This concept-driven, multi-objective technique for analyzing data from cryogenic DT implosions on OMEGA takes into account the trends in all the experimental observables, thereby providing a technique for investigating the cause of the performance degradation and systematic errors in the measurement.



In the photo on the right, student A. Bose is shown with a plot depicting the current standing and future potential of the 100-Gbar Direct-Drive Campaign on OMEGA. This plot illustrates the advantage of the direct-drive approach in producing high fusion yields compared to indirect drive with same laser energy. The downside of this approach is the anticipated drive asymmetries—mid and high modes—that have been analyzed in the context of the experimental results.

The work described in this volume includes current research at the Laboratory for Laser Energetics, which is supported by New York State Energy Research and Development Authority, the University of Rochester, the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-NA0001944, and other agencies.

For questions or comments, contact Sid Sampat, Editor, Laboratory for Laser Energetics, 250 East River Road, Rochester, NY 14623-1299, (585) 275-2596.

Worldwide-Web Home Page: http://www.lle.rochester.edu/

Printed in the United States of America
Available from
National Technical Information Services
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
www.ntis.gov