Diagnostics In High Energy Density Plasmas

April 2-June 6, 2024

Graduate level course offered by University of California San Diego and Lawrence Livermore National Laboratory, Tuesdays and Thursdays at 12:30-1:50 PM PT via WebEx. Lectures will be recorded

- *Offered to all UC students for credit*
- *Offered to LLNL, SNL, and LANL staff for professional development*
- *Offered to all non-UC academic staff and students*
- *Exams and homework will be required of all students wanting credit*
- *UC students, please contact Professor Farhat Beg at fbeg@ucsd.edu for details. Everyone else, please contact Jessica Karlton at karlton1@llnl.gov*

Course Description

The course will introduce the evolving and diverse technologies underlying many of the diagnostics for HED plasmas, with an emphasis on the basic physics and engineering of measurement techniques. Students will explore examples of measurements provided by three large HED facilities—LLNL's National Ignition Facility (NIF), OMEGA at the University of Rochester, and Z Machine at Sandia National Laboratories. The course is open to all national laboratory and university students, postdocs, faculty, and staff.

Selected Topics

- Measurements and theory
- HED facilities
- Implosions, yield measurements
- Neutron and X-ray imaging
- Radiochemistry
- X-ray sources
- Streak cameras
- Opacity and X-ray spectroscopy
- Visar, optical Thomson scattering
- High rep rate, inertial fusion energy
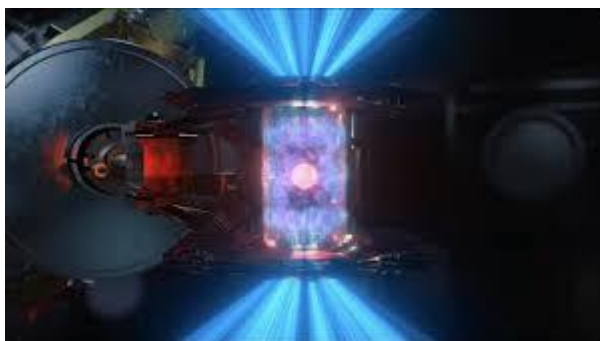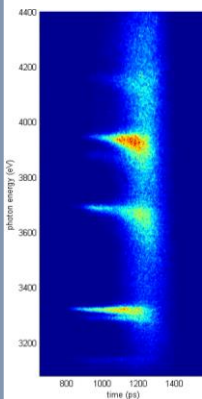
Lecturers

H. Chen	J. Kilkenny
D. Shaughnessy	A. Moore
D. Fittinghof	M. Rubery
B. Kozioziemski	P. Celliers
G. Swadling	N. Lumos
N. Izumi	C. Trosseille