

# Nebraska Center for Materials and Nanoscience

## 2019 Spring Seminar Series

# Sean Regan

Laboratory for Laser Energetics  
University of Rochester  
Department of Mechanical Engineering

## *X-ray Spectroscopy and Inertial Confinement Fusion*

X-ray spectroscopy is a powerful diagnostic for high energy density physics research. It is used to understand the behavior of inertial confinement fusion (ICF) plasma, where spherical shell targets containing thermonuclear fuel (i.e., deuterium and tritium) are imploded with high-power lasers, like the 30-kJ, 351-nm, 60-beam OMEGA Laser at the University of Rochester and the 1.8-MJ, 351-nm, 192-beam National Ignition Facility at the Lawrence Livermore National Laboratory, to form a central hot-spot plasma. High-Z tracer elements provide diagnostic signatures in ICF plasma through emission and absorption of x rays.

In this seminar the diagnosis and physical understanding of hot-spot formation, hydrodynamic mixing, and shock-wave heating and compression using x-ray spectroscopy will be highlighted and discussed.

Sean P. Regan is a Senior Scientist at the Laboratory for Laser Energetics at the University of Rochester and has a secondary teaching appointment in the Department of Mechanical Engineering. He leads a team of scientists in the OMEGA Experiments Group.

He received his Ph.D. in the Department of Physics and Astronomy at the Johns Hopkins University (JHU) in 1995. After completing a Post Doctoral Fellowship with the Plasma Spectroscopy Group at JHU, he joined the Laboratory for Laser Energetics at the University of Rochester in 1997.

His research interests include high energy density physics, inertial confinement fusion, and novel diagnostic development. Sean is a Fellow in the American Physical Society and received 2018 Leadership Award from the Fusion Power Associates Board of Directors.



**February 13, 2019 | 4 p.m. | 136 Jorgensen Hall**

Refreshments in 1st floor vending area at 3:45

**Host: Yongfeng Lu**

Department of Electrical & Computer Engineering

