



**Wednesday**  
**March 12, 2025**  
**3:10 pm**  
**Room 1003 EECS**

## **Dr. Verena Geppert-Kleinrath**

### **Los Alamos National Laboratory**

# **Synergies in Inertial Fusion Energy and Inertial Confinement Fusion Research**

Inertial confinement fusion research has been anchored in the Stockpile Stewardship program for decades. National laboratories and universities have partnered to drive fusion research at the National Ignition Facility through a highly complex National Diagnostics roadmap. Los Alamos National Laboratory has played a crucial role through unique expertise in nuclear diagnostics (neutron and gamma imaging, gamma reaction history measurements, radio-chemical analyses). These diagnostics have taken tremendous development effort and expertise, providing crucial information on fusion implosions (implosion asymmetries, bang time, contaminant mix). Now, since the achievement of ignition and energy gain on the NIF, the US fusion landscape is changing – private companies are emerging with the goal of realizing fusion energy. The DOE Fusion Energy Science program is encouraging private-public partnership to advance fusion energy for the US. While a fusion power plant will likely need a minimal suite of diagnostics, diagnostics will be needed on the path to a pilot plant and diagnostic expertise will be needed to develop a minimally viable set for a plant. This talk explores how the long history of diagnostic expertise at LANL can enable fusion energy research while simultaneously benefitting from a drive for innovation and an energized workforce.

**About the Speaker:** Verena Geppert-Kleinrath is Deputy Group Leader of the P-1 Dynamic Imaging and Radiography group in Los Alamos National Laboratory's Physics Division, managing over 60 scientists, engineers, postdocs, students, technologists and technicians. She also pursues nuclear imaging for inertial confinement fusion (ICF) and is excited about the prospect of fusion energy. She and her team have developed 3D neutron and gamma imaging for the National Ignition Facility (NIF). Her nuclear imaging diagnostics have delivered key performance metrics for high-yield ICF implosions on NIF – ultimately leading to the first successful ignition shots. She has authored over 60 publications in with over 2500 citations. For her successes in ICF diagnostics she has received the Department of Energy Secretary's Honors Award three times and the American Physical Society's John Dawson Award for Excellence in Plasma Physics Research. She serves as the vice-chair for the American Physical Society 4 Corners Section. She has been at LANL since 2012 when she started as a graduate student. Verena holds a PhD in Nuclear Physics from Vienna University of Technology and originally hails from Austria.