

**Shock Compression Seminar Series
APS GSCCM Announcement**

Monday, December 7, 2020 3:00 p.m. Eastern Time

Planetary Defense

*Dr. Megan Syal
Lawrence Livermore National Laboratory*

The question of how to defend Earth from hazardous asteroids and comets has gained substantial U.S. government and international attention in recent years, particularly since the February 2013 Chelyabinsk meteor event. A National Near-Earth Object Preparedness Strategy and Action Plan, released by the White House's Office of Science and Technology Policy in 2018, lays out the goals that NASA, the National Laboratories, and other Federal Departments and Agencies must work toward over the next 10 years to increase the country's readiness. A major goal of this national effort is improving simulations of asteroid mitigation; two of the most effective methods for asteroid impact avoidance, kinetic impact deflection and nuclear deflection or disruption, require extensive shock physics simulations (many in 3D), in order to understand and anticipate asteroid response. Another major goal, strengthening impact emergency procedures, requires accurate shock physics simulations to assess Earth-impact consequences, including airbursts, water, and land impacts. This talk will provide an overview of current planetary defense research activities, including: new meshless methods for assessing airburst consequences; large ocean-wave generation, propagation, and flooding from asteroid impacts; simulations to support the first asteroid deflection test, to be carried out by NASA's DART mission at the "moonlet" asteroid Dimorphos in 2022; and recent work to improve multiphysics modeling and simulation capabilities for nuclear and kinetic deflection of asteroids.

Bio: Megan Bruck Syal is a Design Physicist at Lawrence Livermore National Laboratory (LLNL), where she leads the Planetary Defense project and serves as a Group Leader in the Design Physics Division. She first joined LLNL as a postdoc on the Planetary Defense project in 2014, after receiving her PhD in Geological Sciences from Brown University.

For more information, or to recommend future speakers contact Seminar Organizer, Tracy Vogler at tjvogl@sandia.gov. Or, GSCCM Secretary/Treasurer, Matt Lane at jlane@sandia.gov.