DATA SCIENCE COLLOQUIUM

Dr. Daniel S. Clark

Lawrence Livermore National Laboratory (LLNL) &
National Ignition Facility's (NIF) Capsule Modeling
Working Group, Inertial Confinement Fusion Program

Thursday, April 3rd, 2025
@ 2 pm | On-Site & Online

Recent Progress on Inertial Fusion Ignition at the National Ignition Facility and the Path Ahead

The National Ignition Facility (NIF) at Lawrence Livermore National Laboratory is a 2.2 MJ laser facility designed to achieve inertial confinement fusion ignition. In this approach, the 192 laser beams of NIF are used to compress and heat a millimeter-scale capsule of deuterium-tritium fuel to fusion ignition conditions where the fusion energy produced exceeds the laser energy delivered to the target. On Dec. 5, 2022, a NIF experiment crossed this ignition threshold for the first time. In the two years since, significant further progress has been made with recent experiments producing more than double the amount of laser energy used to drive the implosion.

This talk reviews the importance of the interplay of theory and high-performance computing with experiments, and critical hurdles that had to be overcome to reach ignition, recent progress in NIF experiments since ignition was achieved, and some of the current and future plans aiming for even higher fusion yields.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Chair: Prof. Nina Rohringer

SUBSCRIBE HERE

DASHH Data Science in Hamburg HELMHOLTZ Graduate School for the Structure of Matter

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

DESY.

TUHH Hamburg University of Technology

CLUSTER OF EXCELLENCE
CUI: ADVANCED IMAGING OF MATTER

WOLFGANG PAULI CENTRE Interdisciplinary centre for theoretical physics

INSTITUTE OF MATHEMATICS

CLUSTER OF EXCELLENCE
QUANTUM UNIVERSE

DEPARTMENT OF INFORMATICS

ZBH ZENTRUM FÜR BIOINFORMATIK