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Ignitng fusion plasmas with the Natonal Igniton Facility

Wednesday 29 May 2024 15:30 (30 minutes)

It is a tremendously exci5ng 5me for fusion energy: a9er six decades of research and experimenta5on, self-propaga5ng fusion burns have been achieved in the laboratory at the Na5onal Igni5on Facility (NIF) at the Lawrence Livermore Na5onal Laboratory (LLNL) in California. NIF, the world's largest and most energe5c laser, uses 192 laser beams to deliver over two megajoules of energy in nanoseconds, compressing and hea5ng mm-scale fusion fuel capsules to temperatures and densi5es greater than the center of the sun. On December 5, 2022, for the first 5me in the history of laboratory fusion research, igni5on was achieved, where a target released more energy out than went in to drive it, a key goal of the U.S. stockpile stewardship program and an essen5al first step on the path to fusion energy. This talk will give an overview of the scien5fic and engineering advancements that brought about this breakthrough in iner5al confinement fusion (ICF), and the next steps being taken to push to higher yields.

The success of the NIF has contributed to a surge of interest in fusion energy, in both the public and private sectors. The progress and challenges for iner5al fusion energy (IFE) will be presented, along with the work being done at LLNL and elsewhere to bring about this energy source of the future.

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