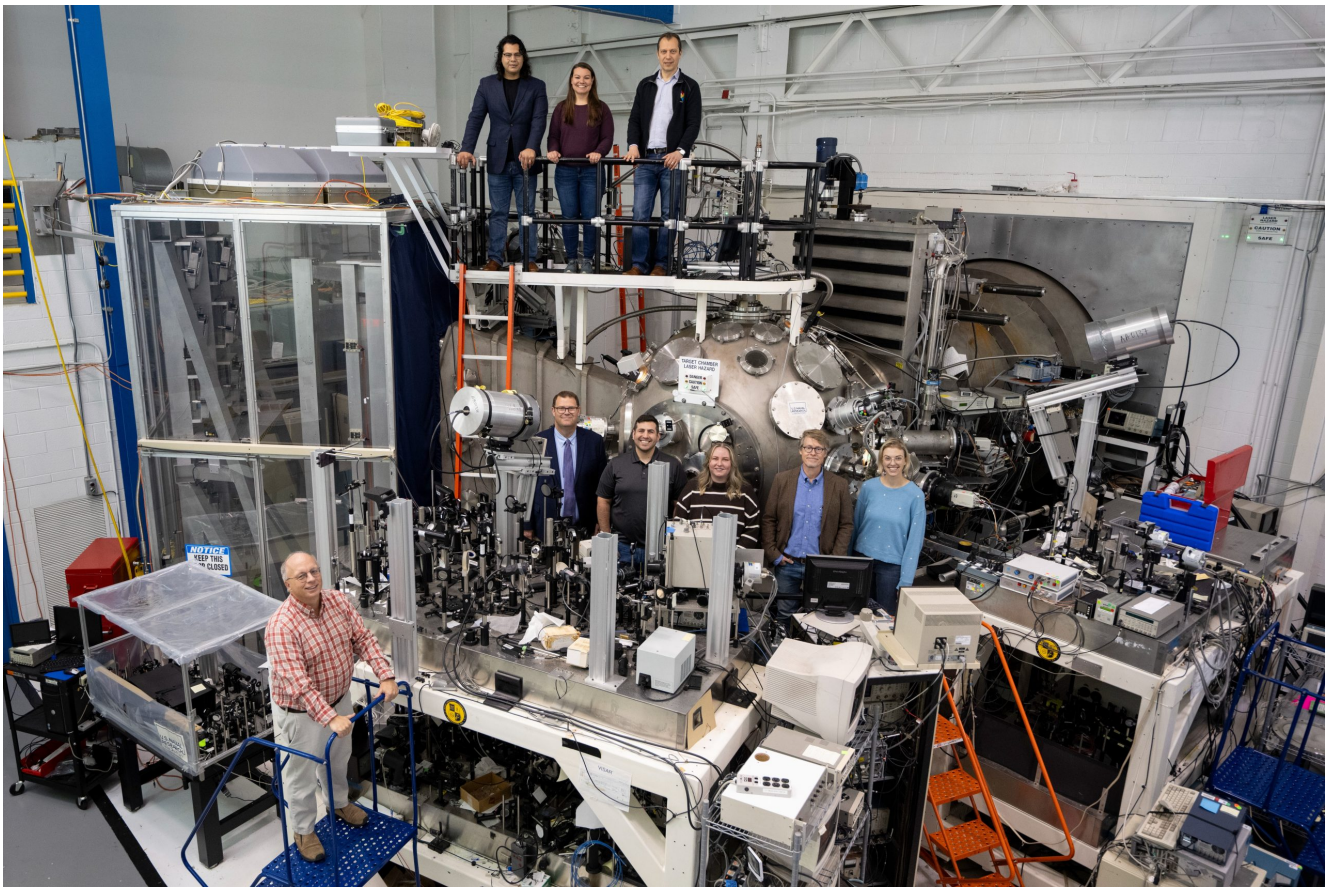
U.S. Naval Research Laboratory's NIKE Laser-Target Facility Helps to Advance DoD Nuclear Mission



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WASHINGTON, D.C. – The U.S. Naval Research Laboratory (NRL) has announced a new strategic direction for its NIKE laser-target facility to align its world-class capabilities with the Department of Defense's (DoD) nuclear strategic priorities.

The new strategic direction marks a shift from the facility's historical focus on Department of Energy (DoE) missions, specifically those related to the National Nuclear Security

Administration (NNSA). The initiative emphasizes NRL's commitment to advancing national security through cutting-edge science and technology.

Originally constructed in 1995 with support from the NNSA, the NIKE (pronounced nai-kee) laser was designed to explore the physics of direct-drive inertial confinement fusion in support of the Nation's nuclear stockpile stewardship mission.

"NIKE is the world's most energetic krypton-fluoride excimer laser, delivering ultrasmooth pulsed beams at a wavelength of 248 nanometers with 2-3 kilojoules of energy," said Jason Bates, Ph.D., head of NRL's Laser Plasma Branch. "These unique capabilities enable researchers to generate strong, stable shock waves and create exceptionally clean experimental conditions for studying extreme physical states of matter."

For decades, the NIKE facility and its scientific team have contributed to NNSA's flagship laser program at the National Ignition Facility (NIF), which recently achieved its landmark goal of ignition where the fusion of hydrogen nuclei produces more energy than the laser energy used to drive the reaction.

Over the years, NRL researchers have pioneered several critical innovations that have transitioned to other NNSA programs including monochromatic x-ray radiography, the Virgil gold M-band spectrometer, and the flashlamp-pumped disk amplifiers for neodymium-doped glass (Nd:glass) lasers. Nd:glass is a material used in certain high-powered laser systems.

Through the creative work of its research team, and a strategic partnership with the Air Force, NIKE's capabilities are now being harnessed to address the central science and technology needs of the DoD nuclear deterrence mission.

"This partnership between NRL and the Air Force Research

Laboratory represents a vital leap forward in our ability to simulate and understand the extreme environments that nuclear assets must navigate," Bates said. "NIKE's unique laser and diagnostic capabilities are unmatched, enabling us to close critical gaps in assessing the survivability of our platforms."

With adversaries such as China and Russia racing to build similar excimer-laser technologies, maintaining and safeguarding the NIKE facility is essential. A recapitalization and reinvestment strategy is underway to secure NIKE's future and support the revitalization of the Nation's nuclear deterrence capability.

"NRL's NIKE facility is an important national asset with unique capabilities that allow it to serve a broad range of missions supporting stockpile stewardship, fusion energy research, directed energy, hypersonics, and fundamental studies of materials at extreme conditions. Its continued operation for the good of the Nation remains our goal through its new focus," said Joe Peñano, Ph.D., superintendent of NRL's Plasma Physics Division.

The Plasma Physics Division conducts broad theoretical and experimental programs of basic and applied research in plasma physics, laboratory discharge, and space plasmas, intense electron and ion beams and photon sources, atomic physics, pulsed power sources, laser physics, advanced spectral diagnostics, and nonlinear systems.

The effort of the Division is concentrated on closely coordinated theoretical and experimental programs in key areas. Considerable emphasis is placed on large-scale numerical simulations related to plasma dynamics; ionospheric, magnetospheric, and atmospheric dynamics; nuclear weapons effects; inertial confinement fusion; atomic physics; plasma processing; nonlinear dynamics and chaos; free electron lasers

and other advanced radiation sources; advanced accelerator concepts; and atmospheric laser propagation.

The NRL Laser Fusion Program traces its origins to the late 1960s, when laser-produced plasmas were first used to investigate the effects of high-altitude nuclear explosions. The program was formally established in 1972 by the Atomic Energy Commission, the predecessor to today’s NNSA.

About the U.S. Naval Research Laboratory

NRL is a scientific and engineering command dedicated to research that drives innovative advances for the U.S. Navy and Marine Corps from the seafloor to space and in the information domain. NRL, located in Washington, D.C. with major field sites in Stennis Space Center, Mississippi; Key West, Florida; Monterey, California, and employs approximately 3,000 civilian scientists, engineers and support personnel.