

October 24, 2018

The Honorable James N. Mattis  
Secretary of Defense  
U.S. Department of Defense  
1000 Defense Pentagon  
Washington, DC 20301-1000

The Honorable Rick Perry  
Secretary of Energy  
U.S Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585

Dear Secretary Mattis and Secretary Perry:

On behalf of The Optical Society (OSA), the international society for optics and photonics (SPIE), and Advanced Nuclear Weapons Alliance (ANWA) Advocacy, we are writing to express our support of the National Nuclear Security Administration's (NNSA) Inertial Confinement Fusion (ICF) and urge you to provide at least \$565 million for the program in the Fiscal Year 2020 Budget. This program is critical to our national security. It is an integral part of the science-based Stockpile Stewardship Program, which is to ensure our nuclear weapons are safe, secure, and effective. The ICF program is more important than ever as the country modernizes its strategic nuclear deterrent.

Effective stockpile stewardship requires ongoing funding and maintenance of all three major, world-leading ICF facilities: the National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory (LLNL) in Livermore, CA, the Z Facility at the Sandia National Laboratories (SNL) in Albuquerque, NM, and the OMEGA Laser Facility at the Laboratory for Laser Energetics (LLE) at the University of Rochester in Rochester, NY. It also requires funding and maintenance of the central facility at General Atomics that provides more than 90% of the targets needed for experiments in the ICF facilities. OSA and SPIE members are users of these facilities and know first-hand the tremendous scientific value these facilities have to national security, discovery science, and U.S. competitiveness.

With the United States voluntarily ending underground nuclear explosive testing in 1992, the only way to annually assess and certify the nuclear weapons stockpile is through the use of experimental and computational scientific capabilities like those maintained by NNSA's ICF program. These facilities play such an important role because they are the only experimental facilities that can achieve the extreme heat, densities, and pressures found in ninety-nine percent of the country's nuclear weapon yield. Without underground testing, inertial confinement fusion research is the only way to understand specific aspects of nuclear weapons performance, weapon effects, and the nuclear survivability of our current stockpile. The results of experiments at ICF facilities also support important decisions related to the maintenance and modernization of weapons systems and achieving scientific milestones set in NNSA's ten-year strategic plan.

The ICF program also maintains U.S. leadership at a time when Russia and China are making significant investments in research capabilities and nuclear forces modernization programs. Recent reports indicate that Russia and China are planning facilities that would rival or exceed the size of NIF, for example. Concern for avoiding "technical surprise from another country" was highlighted in the 2018 Nuclear Posture Review.

The ICF program is a magnet for drawing talented scientists, engineers, and students to national security and related research. These scientists not only ensure the safety and reliability of the country's nuclear stockpile, they are also the experts called upon to evaluate the capabilities of U.S. adversaries. For example, as the DOE's and the NNSA's largest university program, the LLE provides an invaluable national security workforce pipeline, having trained more than 500 PhD candidates as well as offered research opportunities to generations of undergraduates and many high school students. There are also other smaller university programs across our country, such as those at Princeton and in the University of California system, that train the personnel who will be key to the success of this important program. The 2017 Nuclear Posture Review recognized the need to ensure that scientists and engineers of the highest quality are attracted to employment in national security laboratories, and these experimental facilities within the ICF program play a critical role in meeting that objective.

The ICF program also maintains a critical science and technology capability for the country with broad applications for national security, medicine, scientific research, and industry. For instance, ground-breaking work into the design of high-powered lasers, initially completed at LLE for the stockpile stewardship program, was recently recognized with the 2018 Nobel Prize in Physics. Everyday applications include enabling the manufacturing of glass for smartphone screens, cancer treatments, Lasik eye surgery, and ultrafast imaging. These advancements would not have been possible without NNSA's leadership and support.

The ICF program is vitally important for our national and economic security and we thank you for your support. Therefore, we ask that you continue to build on the strong Congressional support for the program in the final FY 2019 Energy and Water Appropriations bill and provide at least \$565 million for the ICF program in the FY 2020 budget request.

Sincerely,



Jeffrey C. Crater  
Managing Director  
Advanced Nuclear Weapons  
Alliance Advocacy



Kent Rochford  
CEO  
SPIE, the international society  
for optics and photonics



Elizabeth A. Rogan  
Chief Executive Officer  
The Optical Society (OSA)

cc: The Honorable Mick Mulvaney