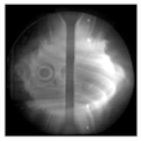


A Request to
*the **Wisconsin** Congressional Delegation*

THE UNIVERSITY of WISCONSIN MADISON

SUPPORT FUSION ENERGY SCIENCES IN FY 2013

HELP THE UNITED STATES REMAIN A WORLD LEADER IN FUSION RESEARCH
RESTORE FUNDING FOR THE DOMESTIC FUSION PROGRAM
AND MAINTAIN OUR COMMITMENT TO ITER

It is imperative that both the domestic research program and the U.S. contributions to ITER be funded to achieve the goals of the U.S. fusion program. To realize the promise of participation in ITER, cultivate future fusion researchers, prepare for the commercialization of fusion energy as an international leader in the field, and steward the fundamental field of Plasma Science, the U.S. must have its own internationally competitive fusion research programs and facilities while fully participating in the groundbreaking ITER project.

FY 2013 BUDGET REQUEST FOR THE OFFICE OF FUSION ENERGY SCIENCES

The President's FY 2013 budget requests $398.3 million for OFES. This includes a $45M increase for the U.S. contributions to ITER, but falls $50M short of the U.S. ITER project's plan and makes it extremely difficult to meet the ITER schedule expectations. It also includes a $49M ***decrease*** from the current funding level for domestic fusion and plasma science research.

This cut will reduce our ability to participate in the exciting scientific promise of the ITER experiment, truncate our ability to plan beyond ITER, and reduce support for Plasma Science. After years of operating on minimal budgets and essentially level funding, the domestic fusion program cannot absorb the proposed reductions without significant negative impacts to the program and our scientific and engineering contributions. Specifically, this Budget Request would result in:

- ***Reduction in the number and utilization of major experiments***
  - Shutdown of Alcator C-Mod at MIT, one of three major U.S. fusion research facilities;
  - Cutbacks in operations, productivity, and upgrades at remaining facilities
- ***Substantial reduction of relevant research for fusion and related Plasma Sciences***
  - Significant cutbacks in Plasma Sciences, fusion theory, computation and simulation;
  - Accelerating cutbacks in university research
- ***Major, negative impacts on workforce development***
  - Layoffs of scientists, engineers, and support personnel throughout the country
  - Loss of graduate students and professors; discouraging potential future researchers
- ***Severe weakening of U.S. competitive position in the world***
  - ITER partners expending considerably more effort toward fusion than the U.S.
  - Reduced ability to contribute to and benefit from scientific advances made by ITER
  - Reductions in our ability to design and build future fusion facilities in the U.S.

RECOMMENDED ACTION

Increase the Fusion Energy Sciences budget request by $49 million to a total of $447 million in FY 2013. This will allow funding for the Domestic Fusion Program to remain at the FY 2012 level, prevent a serious weakening of U.S. fusion research and ensure that the U.S. will remain a world leader in fusion research and a first-tier contributor to ITER with the researchers and program elements in place to fully benefit from ITER when it is complete.

BACKGROUND ON THE U.S. FUSION PROGRAM

Fusion energy is the power source of our sun and the stars. As an energy source for the future it is unrivaled: capable of providing large-scale energy supply using domestically available, virtually unlimited fuel; no greenhouse gas or acidic emissions; inherently safe operation (no Fukushima-like accidents are possible); and no need for long-term waste disposal. Fusion energy is created routinely in laboratories around the world; the remaining challenge is its development into a practical energy source, which only recently has come within our reach.

The U.S. Fusion Program, funded by the DOE Office of Fusion Energy Sciences has two components:

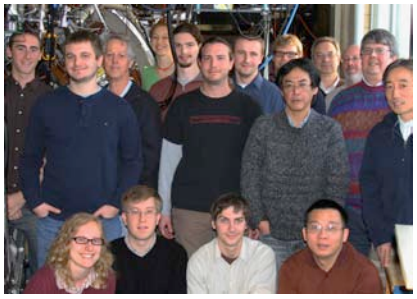
The Domestic Research Program: The domestic fusion program operates three magnetic fusion research facilities (DIII-D at General Atomics in California; C-MOD at MIT in Massachusetts; and NSTX at the Princeton Plasma Physics Laboratory in New Jersey). It also supports numerous university research programs, work in high energy density laboratory plasmas, fusion theory and modeling, enabling R&D, and general plasma science. Together, these elements are key to developing the scientific basis for fusion, educating our future workforce, supporting international collaborations, establishing the foundation for the next steps in the U.S. fusion program and providing scientific advances for the international ITER project.

- **The U.S. Contributions to ITER Project:** The creation, control and study of a self-heated "burning plasma" is a major next step for fusion. ITER is a large facility that will demonstrate the feasibility of fusion power and contribute to its commercialization. The components are designed and fabricated by seven partners (the European Union, China, India, Japan, Russia, South Korea, and the U.S.) and is now under construction. Over 80 percent of the U.S. funds for this project are spent within the U.S. for research, design, and fabrication of components by U.S. industry that will ultimately be shipped to the ITER site for assembly and research operation. Another ten percent funds U.S. personnel working at the ITER site and common expenses. The U.S. will have access to all ITER-developed technology and scientific data while bearing only nine percent of its construction cost.

Photos: Some of the Badgers in fusion R&D…

BENEFITS TO THE STATE OF WISCONSIN

- UW-Madison is a leading contributor to the US fusion R&D programs
  - A recognized center of excellence in Plasma and Fusion sciences
  - Educates our next generation of scientists and engineers
- Adds over $12 million per year to the Wisconsin state economy
  - Obtained by winning competitive, peer-reviewed grants
  - Supports high-quality jobs in Wisconsin
- Employs and nurtures Wisconsin industry



* The graphic on the front page shows a high-speed (1/100,000 sec) photo of instability at the surface of a fusion-related plasma in an experiment at the UW-Madison. This instability is similar to one expected in ITER and beyond. These studies by graduate students contribute to efforts to test the theory of this instability and deploy techniques to suppress it, and thereby enhance the potential efficiency of fusion reactors.

Research Today for Tomorrow's Energy