

February 27, 2012

The Honorable Steven Chu
Secretary of Energy
Washington, DC 20585

The Honorable John P. Holdren
Director, Office of Science and Technology Policy
Washington, D.C. 20502

Dear Secretary Chu and Director Holdren,

As you know, the United States has been an international leader in fusion energy research for decades, delivering numerous scientific and technical advances, and building a world-class fusion science workforce. Following in-depth deliberations and multiple reviews, the U.S. government committed to the international ITER project and to a strong domestic fusion program as the optimal strategy for fusion energy.

With ITER pioneering the study of burning plasma science, the world fusion program is poised to enter the final era of fusion research, where commercialization can be realistically envisioned. This is one of the grand scientific challenges of our time, as expressed by the National Academies of Engineering. Studies by the National Academies and others articulate that the United States must sustain a vigorous domestic research program that enables us to prepare for experiments on ITER, benefit from ITER operation, and solve the remaining challenges for fusion energy.

As leaders and stewards of the current U.S. fusion research effort, we are unfortunately compelled to point out that the Fiscal Year 2013 budget request will demote the U.S. program to a second-tier player in the world fusion effort. After years of operating on minimal budgets and essentially level funding, **the domestic fusion program cannot withstand the proposed reductions without severe negative impact to our essential capabilities and our scientific contributions to the international fusion program in ITER.** If implemented, the \$49 million cut contained in the budget request will result in the layoff of hundreds of fusion scientists, engineers, graduate students, and support personnel, with the following consequences:

- Of our three major fusion research facilities, one will be abruptly terminated (C-Mod at MIT); one will be severely reduced in its operations with facility enhancements cancelled; and one will experience significant delay in its upgrade.
- It will require the shutdown or slowdown of major university programs, with subsequent discouragement of new researchers that could potentially cost us an entire generation.
- It will severely reduce our efforts both in basic plasma physics research and in alternative fusion concept research, which are foundational for the field.
- It will eliminate many opportunities for theoretical and computational discoveries in fusion systems, possibly stunting our ability to exploit advances in high performance computing.
- It will substantially curtail activities in high energy density physics.
- It will endanger our ability to develop fusion-enabling technologies, and to design and build future fusion facilities in the U.S.

The FY 13 budget reductions will deal a blow to the U.S. fusion research program and the U.S. position in the field that will be felt for many years to come.

Further, while the budget's \$150M for U.S. participation in ITER is a \$45M increase from the FY2012 level, it is \$50M below the U.S. ITER Project's plan, making U.S. achievement of the ITER schedule expectations extremely difficult.

As documented in the National Academies' 2004 report, *Burning Plasma: Bringing a Star to Earth*, ITER is the seminal science experiment through which we will explore, understand, and control the burning plasma state. The knowledge gained will inform our predictions of burning plasma behavior in a wide variety of potential confinement systems for fusion reactors. As such, ITER is tightly integrated with the domestic research enterprise that is developing the knowledge base for tokamaks and alternative confinement configurations. The U.S. will have access to all ITER-developed technology and scientific data, while bearing only nine percent of its construction cost. There are few, if any, U.S. government-funded R&D program with such high leverage.

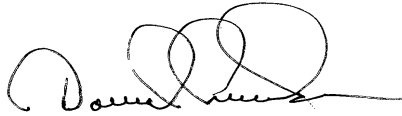
The proposed cuts to the domestic program are rationalized by the need to increase funding for the U.S. contribution to ITER construction. In contrast, our ITER partners are strongly fulfilling their construction obligations, and several nations are additionally strengthening their domestic fusion programs. The proposed FY13 budget takes the U.S. program in the other direction: it puts us well on the road to a time when only our international partners can benefit from ITER (and the U.S. contribution to it) and pursue the remaining steps for fusion.

The fusion community will be working with Congress to restore funding to the program. Meanwhile, we respectfully, but urgently, request that in developing future budgets for the Office of Science, the Administration endeavor to provide funding levels adequate for the U.S. to meet its ITER obligations, but not at the expense of either a strong domestic fusion effort or of other Office of Science programs.

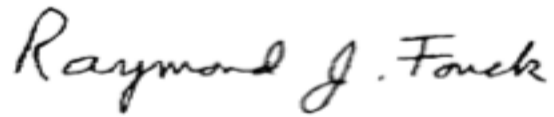
We very much appreciate the challenges of advancing science and energy research, and of balancing the needs of multiple programs. We also thank you for your eloquent advocacy of science as the foundation of a secure energy future. We look forward to working with you to ensure that fusion is part of that future.

Sincerely,

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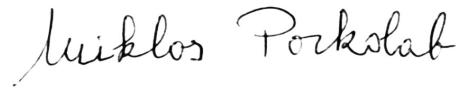
David Anderson
President, University Fusion Association
Professor of Electrical & Computer Engineering
University of Wisconsin - Madison



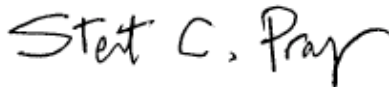
Raymond J. Fonck
Steenbock Professor in Physical Science
Department of Engineering Physics
University of Wisconsin - Madison



Stanley Milora, Director
Fusion Energy Division
Oak Ridge National Laboratory



Miklos Porkolab
Professor of Physics and Director
Plasma Science and Fusion Center, MIT



Stewart C Prager
Professor of Astrophysical Sciences
Princeton University



Ned. R. Sauthoff
Director
U.S. ITER Project Office



Tony S. Taylor
Vice President
Magnetic Fusion Energy Division
General Atomics

cc: The Honorable Dr. William Brinkman, Director, Office of Science
The Honorable Jeffrey Zients, Director, Office of Management and Budget
Dr. Edmund Synakowski, Associate Director, Office of Fusion Energy Science