

A Strategic Plan for U.S. Burning Plasma Research

Update and Schedule

University Fusion Association Meeting
Milwaukee, WI
October 23, 2017

Mike Mael, Columbia University, Co-Chair
Mel Shochet, University of Chicago, Co-Chair

<http://nas.edu/fusion>



Study Origin

**U.S.
Participation
in the ITER
Project**

May 2016

United States Department of Energy
Washington, DC 20585

Message from the Secretary

- ITER remains the best candidate today to demonstrate sustained burning plasma, which is a necessary precursor to demonstrating fusion energy power.
- Having fully assessed the facts regarding the U.S. contributions to the ITER project, I recommend that the U.S. remain a partner in the ITER project through FY 2018 and focus on efforts related to First Plasma. ...
- Prior to the FY 2019 budget submittal (late in calendar year 2017 to early 2018), I recommend that the U.S. re-evaluate its participation in the ITER project to assess if it remains in our best interests to continue our participation.
- My recommendation to support First Plasma cash and in-kind contributions is predicated on continued and sustained progress on the project, increased transparency of the ITER project risk management process, as well as a suite of management reforms proposed in this report ...



Study Origin

U.S.
Participation
in the ITER
Project

May 2016

United States Department of Energy
Washington, DC 20585

National Academy of Sciences Study of the U.S. Fusion Program

- The DOE will request that the National Academies perform a study of how to best advance the fusion energy sciences in the U.S., given the developments in the field since the last Academy studies in 2004, the specific international investments in fusion science and technology, and the priorities for the next ten years developed by the community and FES that were recently reported to Congress.
- This study will address the scientific justification and needs for strengthening the foundations for realizing fusion energy given a potential choice of U.S. participation or not in the ITER project, and will develop future scenarios in either case.

Committee Membership

Michael Mael, Columbia University, Co-Chair

Melvyn Shochet, University of Chicago, Co-Chair

Christina Back, General Atomics

Riccardo Betti, University of Rochester

Ian Chapman, UK Atomic Energy Authority

Cary Forest, University of Wisconsin, Madison

T. Kenneth Fowler, Univ of California, Berkeley

Jeffrey Freidberg, MIT

Ronald Gilgenbach, University of Michigan

William Heidbrink, University of California, Irvine

Mark Herrmann, LLNL

Frank Jenko, IPP, Garching

Stanley Kaye, Princeton University

Mitsuru Kikuchi, National Institutes for Quantum and Radiological Science and Technology

Susana Reyes, LBNL

C. Paul Robinson, Advanced Reactor Concepts, LLC

Philip Snyder, General Atomics

Amy Wendt, University of Wisconsin, Madison

Brian Wirth, University of Tennessee, Knoxville

David Lang, NRC Study Director

Work Plan

Six Meetings, Interim & Final Reports, Town Halls...

- ✓ (June 2017) NAS/D.C.
- ✓ (Aug 2017) NAS/Irvine, CA
- ➡ (Soon 2017) **Interim Report**
 - ▶ (Dec 2017) Austin, TX
 - ▶ (Feb 1-2, 2018) EU
 - ▶ (Feb 26-28, 2018) GA
 - ▶ (~May/June 2018) PPPL
 - ▶ (~Aug 2018) NAS/D.C.
- ➡ (~Oct 2018) **Final Report**
 - Community Workshops:
 - U Wisc-Madison (July 24-28) ←
 - U Texas-Austin (Dec 11-15)
 - Open presentations from experts and community
 - Video Presentations
 - ➡ Contributed input from community submitted online:
<http://nas.edu/fusion>

Towards Completion of the Final Report

- Committee is working hard to carry out the analyses of the many elements required to guide the nation's long-term strategic plan for fusion energy development, **but we need your input and help.**
- Community input: **several site visits, FESAC Transformative Enabling Capabilities Subcommittee**, and your direct input, ...
- ➔ **2nd Community Workshop** (Austin) **Join a Working Group:** Principles, Metrics, and Criteria, Impact of Access to ITER, Fusion Attractiveness, Strategic Approaches, ...
- The final report will fully address the Statement of Task
 - ▶ Strategies built upon status and recent advances in burning plasma science, fusion nuclear science, and the larger international effort.
 - ▶ Consideration include health of fusion research within the United States, continued progress toward a burning plasma experiment, the role of international collaboration, the impact of science and technology innovations, and strategies that may shorten the time and reduce the cost required to develop commercial fusion energy.