USBPO U.S. BURNING PLASMA ORGANIZATION

eNews

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CONTENTS

Dear Burning Plasma Aficionados:

This newsletter provides a short update on U.S. Burning Plasma Organization activities. E-News is also available online at http://burningplasma.org/enews.html Comments on articles in the newsletter may be sent to the editor (R. Nazikian rnazikian@pppl.gov) or assistant editor (Rita Wilkinson ritaw@mail.utexas.edu).

Thank you for your interest in Burning Plasma research in the U.S.!

Director's Corner by J. Van Dam

Physics Task Agreements for ITER

The ITER Organization has recently issued calls for proposals on several task agreements. These work solicitations would be set up as task agreements between the ITER Organization and Domestic Agencies. The Domestic Agency for the US is the US ITER Project Office in Oak Ridge. Anyone who is interested in submitting a proposal on these tasks should send it to the US ITER Project Office for review and acceptance. The due date for submission has been extended to April 9. Pricing information should be submitted in an attachment separate from the proposal. The US ITER Project Office will determine the appropriate credit to be requested from the ITER Organization, obtain approval signatures, and finalize submittals to ITER. For proposals that the ITER Organization accepts, the US ITER Project Office will set up the necessary contracts with the task performers, since the funding will be provided through the US ITER Project Office. If there are any questions about the task agreements, please contact Wayne Steffey <steffeyrw@ornl.gov>, 865-574-8364.

Here is a brief summary of the task agreements.

1. *Task on the study of control of plasma current, position, and shape*—This task consists of two subtasks: plasma vertical stabilization, and control of plasma termination.

2. *Task on self-consistent simulations of plasma scenarios*—The design and self-consistent simulations of ITER representative plasma scenarios will contribute to the plasma scenario database used for assessment of capability of different engineering systems (power supply, center stack and poloidal field coils, cryoplant, etc.).
3. *Task on the study of plasma start-up*—This task involves the design and simulation of scenarios for plasma start-up, including plasma initiation and current ramp-up, in particular the simulation of operation of the poloidal field system at these stages of scenario. The results will be used for design of the power supply and the first wall, as well as for preliminary study of the plasma control strategy at the initial phase of plasma start-up.

The requested deliverables for each task are reports that describe the statement of each problem, input data and approximations used in the studies, and the results obtained (including figures and Excel tables). Intermediate reports will be due at the end of each four-month period, with completion at the end of 12 months.

Update on ITER Special Expert Groups

The *ITER Research Plan Working Group* has begun its activities to extend the ITER Research Plan document. So far, two teleconference meetings of the participants have been held. On-site meetings in Cadarache are scheduled for March 12-13 and April 15-17. The goal is to have Version 2 of the document ready for the next meeting of the Science and Technology Advisory Committee, which will be held May 25-27. The five US participants in the ITER Research Plan Working Group have taken on responsibilities to work in the following areas:

- Definition of scenarios (Mickey Wade)
- Burning plasma physics program (Steve Wolfe)
- Upgrade options (Ed Synakowski)
- Acceleration of the deuterium-tritium program (Michael Bell)
- Integration of the Test Blanket Module program (Stan Milora)

If you would like to provide input or support in any of these areas, please contact the corresponding US participant(s) directly.

The *Integrated Modeling Expert Group* for ITER has scheduled its annual meeting for June 22-26 in Cadarache, the week prior to the European Physical Society's Plasma Physics Meeting. The agenda for the meeting will cover the following items:

- Status of the ITER integrated modeling program
- Progress and plans in the Members' integrated modeling programs
- Progress and plans of the ITER integrated modeling program
- Priorities for tasks, user support, hardware and software infrastructure, etc.
- Updating the ITER Physics Work Program with respect to integrated modeling

Wayne Houlberg (formerly at ORNL, now at the ITER Organization) is the leader for this expert group. As a reminder, the two US participants are Don Batchelor and Lang Lao.

The *Test Blanket Module Program Committee* will have its first meeting March 25-26 in Aix-en-Provence. Last month I reported that the US representatives on this program committee would be Jeff Hoy, Mike Hechler, Mohamed Abdou, and a fourth person with experimental tokamak operations experience. I am pleased to announce that Rob Goldston will be this fourth participant.

Interactions with European Task Groups

The USBPO recently sponsored an internet seminar about recent developments related to a possible lower hybrid current drive system for ITER. The talk, presented by Tuong Hoang and Alain Becoulet from CEA Cadarache, who are leading a special European working group on lower hybrid for ITER, is posted on the USBPO web site for your reference (http://burningplasma.org/reference.html, "ITER Presentations").

Bruce Lipschultz recently attended a two-day meeting in Cadarache sponsored by a European task group on tungsten divertors for ITER. The present strategy for ITER is to begin with a divertor that has carbon graphite armor at the strike points and later, before operation with deuterium and tritium, to switch to a tungsten divertor in order to deal with the problem of tritium retention. However, there have been proposals to begin ITER operation with a tungsten divertor from Day One. The discussion of this question is complex. Several fusion devices in the world program (e.g., ASDEX-U, C-Mod, and JET) are studying high-Z plasma-facing components. These results will be important for quantifying high-performance operation with tungsten.

Fusion as an Engineering Grand Challenge

The US National Academy of Engineering organized a survey last year to choose specific grand challenge problems that await engineering solutions in the general areas of human sustainability, health, vulnerability, and joy of living. Between February 15 and June 30, 2008 (when the poll closed), a total of 25,113 votes were received. The results from that poll were ranked, and Number 2 on the list was *Provide energy from fusion*. This challenge was described as follows: "Another popular proposal for long-term energy supplies is nuclear fusion, the artificial re-creation of the sun's source of power on Earth. The quest for fusion has stretched the limits of engineering ingenuity, but hopeful developments suggest the goal of practical fusion power may yet be attainable." The poll results are posted online (http://www.engineeringchallenges.org/cms/8996/9221.aspx, (click on "Poll"). My thanks to Chuck Greenfield for pointing out this web site.

People in the News

The February 2 issue of *Physics World* magazine has an interesting article about Sir Chris Llewelyn-Smith, former Director-General of CERN and recently retired Director of UKAEA Culham Laboratory, who is currently serving as Chair of the ITER Council (http://physicsworld.com/cws/article/print/37515).

The February 23 *ITER Newsline* reported that Dr. Robert Aymar, former Director of ITER in its Engineering Design Activities phase and recently retired as Director-General of CERN, has been appointed as Special Advisor to the new Administrator-General of the French Commissariat a l'Energie Atomique (CEA), Bernard Bigot.

The March 2 *ITER Newsline* reported that Dr. Michael Roberts, retired from the Office of Fusion Energy Sciences of the US Department of Energy, has been appointed by the ITER Council as Chair of the Export Control Working Group. This group helps to deal with controls on the flow of sensitive information about technology and materials that is exchanged between the ITER Organization and the Domestic Agencies of the ITER Members. Mike is very familiar with ITER, having been involved with the project since its inception. Another US member of this working group is John Glowienka (DOE/OFES).

Last, but not least, we welcome Rita Wilkinson as the new Administrator for the US Burning Plasma Organization. In this capacity she will also serve as the assistant editor for *eNews*. This issue is her first one. Welcome, Rita!

Announcements

Participation is invited for the 2009 Alcator C-Mod Ideas Forum on April 6-8, 2009. The Forum aids in the planning of the FY09/10 C-Mod Operating Campaigns by providing an opportunity for presentation of specific ideas appropriate for experiments during the upcoming runs. As usual, the Forum will be open to all interested parties, including current and potential future collaborators. We actively solicit proposals from the entire fusion community, and we will make remote participation available. All sessions will be held in the main conference room of the MIT Plasma Science & Fusion Center: Room NW17-218,175 Albany Street, Cambridge, MA. You are invited to visit the website at http://www.psfc.mit.edu/research/alcator/program/ideas2009/

2009 Burning Plasma Events

Jan 13-14
FESAC
Gaithersburg, MD

Jan 18-23
8th IEA International Wksp on SiC/SiC
Daytona Beach, FL

Mar 2-4
4th Workshop on Stochastic Fusion Plasmas
Julich, Germany

Mar 31-Apr 2/3
Joint mtg of the ITPA Transport & Confinement TG & the Integrated Operational Scenarios TG
Naka, Japan

Apr 6-8
ITER Export Control Working Group Mtg
Washington, DC

Apr 20-22
ITPA Pedestal & Edge Physics Topical Group Mtg
Cadarache, France

Apr 20-24
ITPA Diagnostics Topical Group Mtg
St. Petersburg, Russia

Apr 21-24
Joint mtg of the ITPA Energetic Particles TG & the MHD TG
Daejon, South Korea

Apr 28-May1
Transport Task Force Workshop
San Diego, CA

May 2-5
Sherwood Theory Fusion Conference/APS April Mtg
Boulder, CO

May 5-8
ITPA Sol & Divertor Topical Group Mtg
Utrecht Amsterdam, FOM Rijinhuizen

May 11-14
12th International Wksp on Plasma-Facing Materials & Components for Fusion Applications
Julich, Germany

May 25-30
STAC, MAC CPWG
TBD

May 31-Jun 5
ICOPS-SOFE 2009 Conference
San Diego, CA

Jun 14-18
ANS Annual Mtg
Atlanta, GA

Jun 24-26
18th Conf on RF Power in Plasmas
Gent, Belgium

Jun 29-Jul 3
14th International Conference on Emerging Nuclear Energy Systems (ICENES-2009)
Ericeira, Portugal

Jul 12-16
17th International Conference on Nuclear Engineering (ICONE 17)
Brussels, Belgium

Jul 15-16
ITPA Coordinating Committee Mtg
Cadarache, France

Sept 6-11
6th International Conf on Inertial Fusion Sciences and Applications (IFSA 2009)
San Francisco, CA

Sept 7-12
14th International Conf on Fusion Reactor Materials (ICFRM-14)
Sapporo, Japan

Sept 21-24
14th International Symp on Laser-Aided Plasma Diagnostics (LAPD-14)
Castelbrando, Treviso, Italy

Oct 5-7
ITPA Transport & Confinement Topical Group Mtg
PPPL, US

Oct 6-8
ITPA Pedestal & Edge Physics Topical Group Mtg
Princeton, New Jersey

Oct 11-16
9th International Symp on Fusion Nuclear Technology (ISFNT-9)
Dalian, China

Nov 2-6
51st APS-DPP Mtg
Atlanta, GA

Fusion Research-related events can also be seen on the USBPO web at http://burningplasma.org/events.html.