ANNOUNCEMENT (December 2, 1997)

FY-1998 (Second) National Spherical Torus Experiment (NSTX) Research Forum

December 3-5, 1997, PPPL

I. Purpose and Motivation

The FY-1998 NSTX Research Forum, being the second of such Forums, will provide an efficient opportunity for

* Outreach to the broad expertise of the U.S. plasma and fusion science community for input to update the scientific elements of the National NSTX Research Program, and
* Provide information useful for researchers in preparing Letters of Interest to the NSTX Program and Research Proposals to DOE.

You are cordially invited to participate in the Forum and contribute to achieving these goals.

The NSTX Research Forum is an important step in a nationally based process to develop and update the NSTX Research Program. The Letters of Interest provide crucial input to assist the NSTX Program in formulating the national NSTX Research Program Proposal to DOE, in parallel with separate Research Proposals by institutions and groups to DOE for funding to participate in research utilizing the NSTX facility. Detail of this national process is available at

http://fileroom.pppl.gov/nstxhome/nstx/Research_Program/National_Process/

in Acrobat Reader (*.pdf) and (*.html) formats. This announcement is available at

http://fileroom.pppl.gov/nstxhome/nstx/Research_Program/Meetings/FY98_Research_Forum/

and is updated there as necessary.

There will be no registration fee for attending the Forum. We intend, with support of presenters and participants, to make all presentations available for Internet access in a timely manner.

The NSTX, beginning in FY 1999, will be capable of testing the scientific principles of the new ST plasma regime. For this regime it is possible to have

* Stable ultra high beta plasmas with high, well-aligned self-driven current fractions;
* Confinement associated with strong magnetic well, magnetic shear, sheared plasma flow, and large gyroradius relative to plasma size;
* Noninductive startup and current drive involving minimized magnetic flux and helicity per plasma current;
* Supra-Alfvenic energetic particle speed; and
* Impurity control through scrape-off layers characterized by strong mirror-ratio and magnetic expansion.

Opportunities for discovery, innovation and advancement in fusion and plasma sciences are therefore indicated.

The mission and the scientific motivation of the NSTX Program and the NSTX Project to build the world-class NSTX facility located at the Princeton Plasma Laboratory is available at

http://www.pppl.gov/oview/pages/NSTX.html

II. NSTX Working Groups (WGs) and Contributions

A centerpiece of the Forum will be the open topical NSTX WG Sessions. The WGs serve to

* Encourage and receive input synopses suggesting important and interesting updates to the scientific elements of NSTX Research summarized in the WG reports of the first NSTX Research Forum (see, http://fileroom.pppl.gov/nstx/research program/meetings/FY97 Research Forum/);
* Organize open WG Sessions during the NSTX Research Forum;
* Hold the WG Sessions for all contributors to present, discuss, improve, and integrate their inputs into scientific elements with logical time sequence;
* Present summaries of the WG Session results at the NSTX Research Forum; and
* Produce reports on the updated scientific elements of NSTX Research.

The WG research areas are organized as follows:

WG1. Slow (MHD) Mechanisms for Current Formation and Sustainment
WG2. Fast Mechanisms for Heating, Current Formation and Sustainment
WG3. Magnetics and Stability Limits
WG4. Transport and Fluctuations
WG5. Divertor, Scrape-Off Layer, Power and Particle Handling
WG6. Diagnostics

Each report for WG1-WG5 should contain updated information on

- Scientific goals for the WG research area during the initial 3 years of the NSTX experimentation, emphasizing the unique ST plasma properties
- Elements of research to achieve these goals, including for each element
  * anticipated scientific results
  * relevance to the research goals
  * needed plasma operating conditions
  * necessary measurements and accuracy
- Recommended an time order for these elements
- Appendix: input synopses

WG6 report should contain updated information on

- Required diagnostics during the initial 3 years of the NSTX experimentation, emphasizing the unique ST plasma diagnostics needs
- Elements of development for these diagnostics, including
  * anticipated plasma operating conditions
  * suggested techniques
- Recommended time order for developing the diagnostics
- Appendix: input synopses

III. Participants' Input to the Working Groups

Researchers interested in participating in the NSTX Research Program are encouraged to send (via email if possible) input (one-page synopsis) by November 14, 1997 to the WG leaders of the appropriate topic, Martin Peng (mpeng@pppl.gov), Masayuki Ono (mono@pppl.gov), and Stan Kaye (skaye@pppl.gov). The WG members are encouraged to inform colleagues of this opportunity of providing important input to the National NSTX research program. The WG leaders will organize the WG session agenda based on the input.

For WG1-WG5, the synopsis should contain:

1. Scientific issue being addressed (experimental and/or theoretical)

2. Relevance to ST plasma and fusion science, identifying issues unique to the ST
3. Plasma parameters and operating condition required
4. Measurements needed and/or recommended

For WG6, the synopsis should contain:

1. Plasma properties to be measured by the new or improved diagnostics
2. Relevance to ST plasma and fusion science, identifying issues unique to the ST
3. Plasma parameters and operating condition anticipated
4. Development needed and recommended

IV. Working Group Members

The FY 1998 WG members to date are tentatively listed below. The WG leaders (L) and members have graciously agreed to serve in the capacity described above and according to the schedule described in Section VI. We very much welcome volunteers and suggestions of additional WG members to strengthen our ability to cover a wide range of interesting research topics. Please get in touch with the WG leaders of the topic of interest provided below, or the NSTX leaders provided in Section VII.

WG1. Slow (MHD) Mechanisms for Current Formation and Sustainment

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K.C. Shaing (IFS)	shaing@hagar.ph.utexas.edu

WG2. Fast Mechanisms for Heating, Current Formation and Sustainment

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WG3. Magnetics and Stability Limits

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WG4. Transport and Fluctuations

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WG5. Divertor, Scrape-Off Layer, Power and Particle Handling

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WG6. Diagnostics

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V. Format of Research Forum

The Forum will have three components:

1. Plenary session (one-day) to present information on NSTX scientific mission, research topics of interest and areas available for enhanced research collaboration, expected facility capabilities and schedule, and approach for research preparation. Also to be presented are ST research plans of CDX-U (PPPL), Pegasus (University of Wisconsin), and HIT-U (University of Washington).
2. Open parallel WG Sessions (one-day) for the contributors to present, discuss, improve, and integrate the input on NSTX research and diagnostics.
3. Plenary session (half-day) to summarize the WG session results for comments, in preparation of the updated reports on scientific elements of the NSTX Research; and to announce the solicitation of Letters of Interest.

An opportunity will be available following the forum (1-2 pm) for the interested to tour and comment on the planned NSTX site, equipment, and facilities.

VI. Schedule and Working Group Reports

The following schedule is suggested:

November 14: Receive input synopsis on presentations in the WG sessions
November 26: Organize WG sessions and distribute Forum agenda
December 3-5: NSTX Research Forum
December 19: Produce and distribute updated WG Reports on Internet

VII. Questions and Suggestions

Please contact the WG leaders, or the following if you have questions and/or suggestions:

Bob Kaita, NSTX Diagnostics WBS Manager	rkaita@pppl.gov
Dave Johnson, PPPL Diagnostics Leader	djohnson@pppl.gov
Stan Kaye, NSTX Project Physics Manager	skaye@pppl.gov
Masa Ono, NSTX Project Director	mono@pppl.gov
Martin Peng, NSTX Program Director	mpeng@pppl.gov
Joanne Savino, 609-243-3379	jsavino@pppl.gov

will provide administrative assistance for the NSTX Research Forum. She will issue on Internet information on the local arrangements for the Forum.

Steve Davis, 609-243-3170	sdavis@pppl.gov

has kindly agreed to assist in building web pages on Internet to provide the latest information on the NSTX Research Forum.