NSTX

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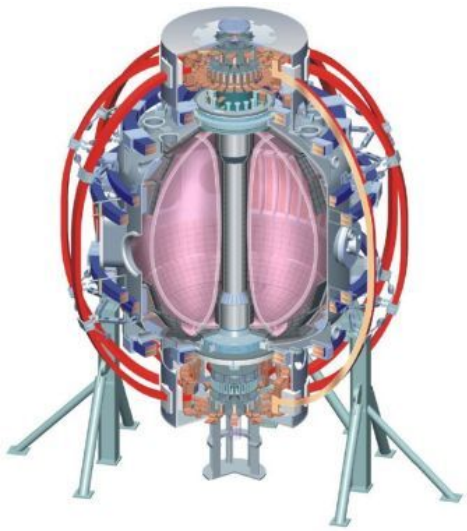
NSTX Program Update

J. Menard, S. Kaye

NSTX Team Meeting
B318, PPPL
May 5, 2009



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NSTX Program Update Topics

- PAC-25 highlights
- Stimulus funding for NSTX (ARRA)
- Research Needs Workshops (ReNeW)
- Recent ITPA/conference highlights – S. Kaye

NSTX held successful PAC-25 meeting (1)

- Introduction
  - "FY2008 run was a tremendous success by every measure."
    - "NSTX achieved more than 16 run weeks (exceeding its target) and completed 43 experimental proposals and 12 machine proposals. Management of the run was particularly effective." (Thanks to Mike for run coordinating, and to everyone involved!)
- General Observations and Recommendations:
  - "The PAC believes that the number of personnel on the NSTX National Team has not kept pace with the increased capability of the NSTX research facility"
    - "PPPL should use the opportunity provided by the start of an exciting 5-Year Plan to expand the staff and strengthen collaborations at NSTX."
  - "The PAC encourages the NSTX Team to more fully embrace their top-level research and programmatic priorities in annual research planning"
    - "During the next three years, experiments should be planned to resolve technical questions and reduce scientific uncertainty associated with the longer-pulse, higher-power discharges planned for the post-upgrade period."

NSTX held successful PAC-25 meeting (2)

- General Observations and Recommendations (continued):
  - "The PAC recommends that the NSTX Team consider ways to devote additional resources to the investigation and development of a high heat flux divertor…"
    - "For next year's PAC meeting, we request that the NSTX National Team make an explicit presentation detailing what will be the heat flux targets required in post-upgrade discharges and identification of high-heat flux divertor options compatible with reasonable density control targets"
  - "Additionally, the PAC anticipates significant progress resulting from the two major new NSTX capabilities: experiments using the LLD and the use of HHFW as a research tool for comparative discharge studies."
    - Because of the importance of boundary and pedestal physics, the PAC suggests that the installation of additional multipoint Thomson scattering channels should be accelerated
  - Comments on integrated scenarios:
    - …emphasis towards development of scenarios with controlled fuelling/density
    - …work towards the integration of HHFW H & CD into standard scenarios
    - …important to maintain staff/expertise in TSC modelling area

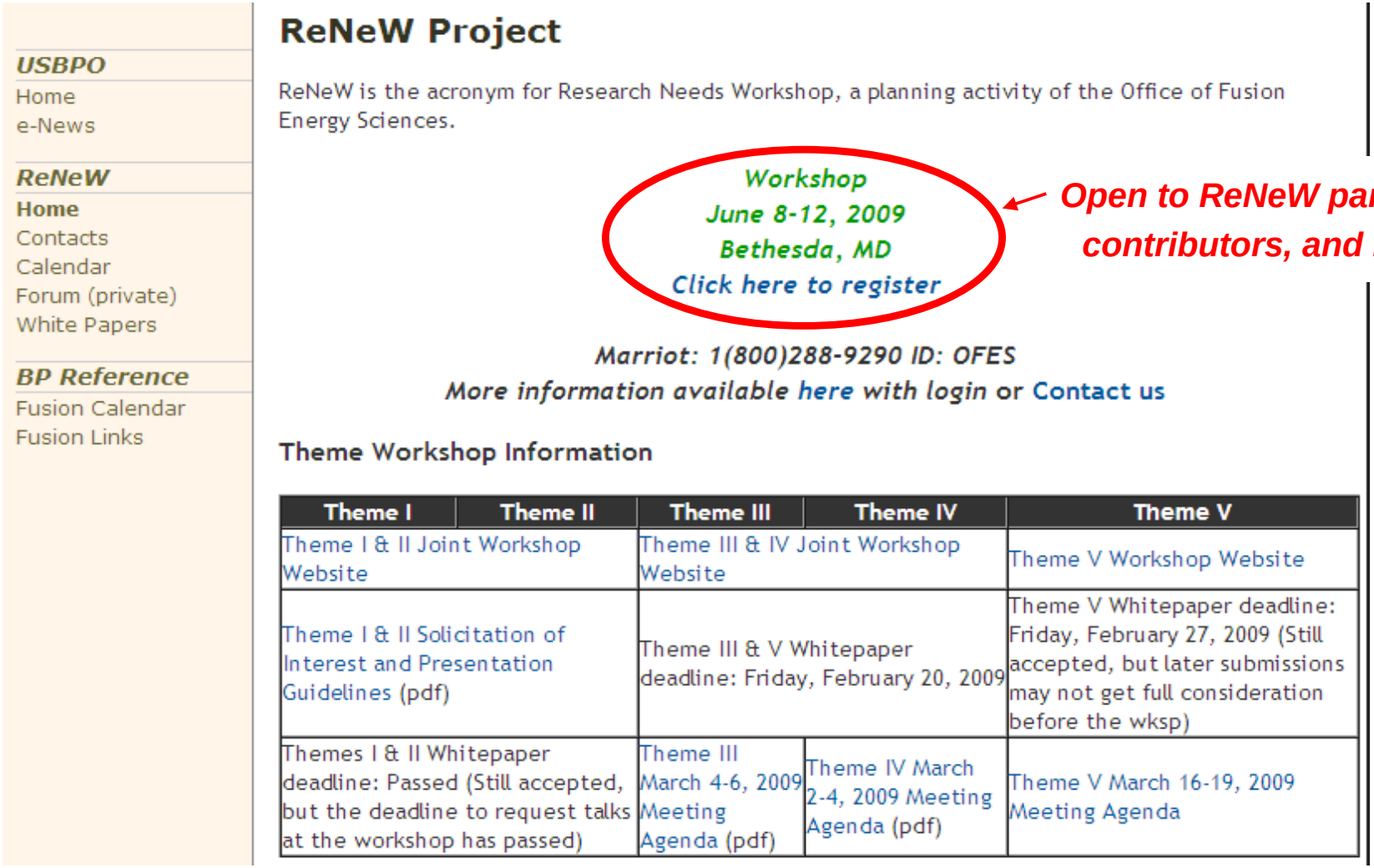
ARRA funding will greatly enhance research capability and scientific output of NSTX

- Enhanced operation of Major Fusion Facilities in FY09 and FY10
  - NSTX: 5 extra run weeks in FY2009-10
- Diagnostic and Facility Upgrades in FY2009-11:
  - Additional (10-15) channels for multi-pulse Thomson scattering
    - Improved resolution of H-mode pedestal (FY11 joint milestone), core ITB, edge/SOL
  - Complete Motional Stark Effect - Laser Induced Fluorescence
    - Internal |B| and radial electric field measurements
  - Enhanced LLD capability for improved divertor pumping, ν^* control
    - Considering improved Li replenishment, inboard divertor LLD
  - 2^{nd} switching power amplifier system
    - Improved error field/resistive wall mode/resonant magnetic perturbation spectral control
    - First step for implementing near-edge rotation profile control using NTV
    - Also benefits CHI absorber coil ops, possible (future) internal 3D coil system
  - Upgrade to a plasma wave heating system
    - Start-up, ramp-up and plasma sustainment research crucial for ST development path.
- Post-docs: now: MPTS, CHERS, near-term: Li/PMI, HHFW, TRANSP/TSC

Stan Kaye will chair meeting to discuss ARRA upgrades – May 19, 1:30PM, B318

Three ReNeW meetings in March had strong ST/NSTX/LTX participation (CTF/FNSF, NHTX, liquid Li, e-transport, etc…)

- http://burningplasma.org/web/renew.html
- Meeting in Austin now to coordinate chapters and “Thrusts”



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ReNeW Project

ReNeW is the acronym for Research Needs Workshop, a planning activity of the Office of Fusion Energy Sciences.

Workshop
June 8-12, 2009
Bethesda, MD
Click here to register

Open to ReNeW participants, contributors, and invitees

Marriot: 1(800)288-9290 ID: OFES
More information available here with login or Contact us

Theme Workshop Information

Theme I	Theme II	Theme III	Theme IV	Theme V
Theme I & II Joint Workshop Website		Theme III & IV Joint Workshop Website		Theme V Workshop Website
Theme I & II Solicitation of Interest and Presentation Guidelines (pdf)		Theme III & V Whitepaper deadline: Friday, February 20, 2009		Theme V Whitepaper deadline: Friday, February 27, 2009 (Still accepted, but later submissions may not get full consideration before the wksp)
Themes I & II Whitepaper deadline: Passed (Still accepted, but the deadline to request talks at the workshop has passed)		Theme III March 4-6, 2009 Meeting Agenda (pdf)	Theme IV March 2-4, 2009 Meeting Agenda (pdf)	Theme V March 16-19, 2009 Meeting Agenda

ITPA Meeting Participation

- Transport and Confinement (Naka, 3-4/09) – Kaye, Mikkelsen, Hahm
  - Effect of rotation on confinement
  - Electron transport
    - Possible JEXs on microtearing (NSTX, MAST, AUG, …..), "GAE"-induced transport (NSTX, MAST, ???)
      - To be discussed at next meeting (PPPL, 10/5-7/09)
- Pedestal (Cadarache, 4/09) – Maingi
  - Edge stability properties with nRMP ELM suppression
  - ELM-pacing
- MHD (S. Korea, 4/09) – Sabbagh
  - RWMs, NTV, NTM, Aspect ratio comparison
- Others?

Joint U.S./EU TTF (San Diego, 4/28-5/1/09)

- Stan Kaye talk: Momentum Transport Studies in NSTX
- Doug Darrow talk and poster: Neutral Beam Ion Loss During TAE Avalanches in NSTX Plasmas
- Eric Fredrickson poster: Modeling Fast Ion Transport in TAE Avalanches in NSTX
- David Smith Plenary talk: Observations of electron gyro-scale fluctuations near ETG marginal stability in NSTX plasmas with large ExB flow shear

- Discussion of disagreements between theory & experiment
- Discussions on tying U.S. TTF more into ITPA, EU TTF