Planning for the next ARIES Town Meeting:
“Edge Physics Modeling and Experimental Verification for Fusion Power Plants”

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ARIES Project Meeting
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Motivation and Goals

**Motivation**
- We lack credible modeling capability for ARIES studies
- Insufficient attention has been paid to power plant specific needs
- Insufficient communication occurs between theoreticians, modelers, experimentalists and device designers
- We can help bring together the (international) community on this critical topic.

**Goals and Outcomes**
- Evaluate the current state of the art in numerical model development and experimental validations
- Establish the current best prediction of the edge physics conditions in a tokamak power plant
- Create a community of edge physics modelers and experimentalists
- Initiate a series of workshops (establish core organizers)
- Produce a journal article
Organization

1. Organizers
   • M. S. Tillack (UCSD), C. Kessel (PPPL), A. Turnbull (GA)

2. Steering Committee
   • A. R. Raffray (ITER IO)
   • T. Rognlien (LLNL)
   • G. Tynan (UCSD)
   • F. Najmabadi (UCSD)

3. Additional members are desired, e.g.
   • Dave Hill (DIII-D/LLNL)
   • Rajesh Maingi (NSTX/ORNL)
   • Bruce Lipschultz (C-Mod/MIT)
   • David Coster (EU)
   • Andre Kukushkin (ITER)
   • Nobuyuki Asakura (JAEA)
Timing and Location

1. To be held on the campus of UCSD

2. The week before PSI has emerged as the top choice
   • PSI is May 24-28; Town Mtg will be May 19-21 or 20-21
   • This will probably increase international participation
   • The disadvantages of preceding PSI are considered tolerable
   • We can advertise on the PSI web site
   • http://fusion.gat.com/conferences/psi2010

3. Can we (should we) squeeze into 2 days?
Topics are divided into 8 sessions

1. Opening Session, Background
   - Welcome, logistics, meeting goals
   - Overview of current ARIES study, definition of the reactor regime
   - Definition of ITER’s edge regime
   - IHHFC town meeting summary and conclusions (optional)
   - Guidance from ReNeW Theme III

2. Physics of the edge - current understanding and projections to ITER and power plants
   - ELM’s and ELM control
   - Scrape-off layer physics
   - Disruptions and off-normal events
   - PMI

3. Innovative divertor concepts
   - Super-X
   - Snowflake
   - Liquid metals
   - EU or Japan contributions???
Topics and Sessions, continued

4. **Modeling of the tokamak edge**
   - UEDGE, particle drifts, and kinetic effects
   - ITER and Demo modeling with B2-Eirene
   - SOLPS + PMI modeling
   - neutrals modeling

5. **Technology issues, constraints and modeling**
   - PMI
   - neutrons and material limitations
   - HHF
   - control coils and their design implications

6. **Experimental verification of models for power plants**
   - ReNeW angle on research gaps
   - D-III D plans for model verification
   - Alcator plans for model verification
   - NSTX plans for model verification
   - PISCES plans for model verification
   - EU or Japan experiments
Topics and Sessions, continued

7. New devices
   - the role of NHTX in edge physics verification
   - the role of FDF in edge physics verification
   - the role of CTF in edge physics verification

8. Working Group
   *(to discuss future plans, for those wishing to remain)*
   - Discussion
   - Conclusions
   - Documentation
   - Next steps
Hospitality

- Morning and afternoon breaks
- Hosted dinner (?)
  - If dinner is hosted, then we will charge $75~$100 reg fee
  - Where to hold dinner?
  - Provide transportation to dinner?
- Should we designate a meeting hotel?
Planning Schedule

- Contact additional steering committee members and seek their advice (Jan ‘10)
- Contact potential speakers (Jan ‘10)
- Obtain blessing from DOE? (Jan ‘10)
- Create 1st draft and distribute 1st announcement (Feb ’10)
- Finalize venue, lodging, dining plan, agenda (April ‘10)