

# International Workshop on MFE Roadmapping in the ITER Era

Princeton University, McDonnell Hall  
Princeton, NJ, U.S.A.

7 -10 September 2011

## Agenda

### Workshop Topics

- Perspectives on Demo and the Roadmap to Demo
- Technology: Basis, Gaps, Risks, and Facility Needs
- Physics-Technology Integration and Optimization: Basis, Gaps, Risks, and Facility Needs
- Major Facilities on the Path to Demo: Missions, Requirements, and Risks

### Wednesday, 7 September 2011.

#### Perspectives I. H. Zohm, Chair

- 08:30 S. Prager, *Welcome*  
08:45 D. Maisonnier, *Toward a Credible EU Roadmap for Fusion*  
09:45 J. Li, *On Chinese Strategy for Fusion Energy*  
10:30 Break  
  
10:45 M. Kwon, *On Korean Strategy for Fusion Energy*  
11:30 R. Srinivasan, *On India's Strategy to Fusion Energy*  
12:15 Discussion  
12:30 Lunch

#### Perspectives II. G. Federici, Chair

- 13:45 K. Okano, *Case Study of Roadmap to Tokamak Demo Reactor in Japan*  
14:30 E. Azizov, E. Velikhov, *On Russian Strategy for Controlled Fusion*  
(presented by B. Kuteev)  
15:15 N. Lopes Cardozo, *Placing Fusion in the spectrum of energy development programs*  
15:20 Break

#### Technology I: Materials Mini-Session. G. Federici, Chair

- 15:30 S. Zinkle, *Materials Issues and Facility Needs on the Pathway to Fusion Energy*  
16:15 E. Diegele, *Structural Material Development and Database for Future Fusion Reactors –Current Status and Prospects*  
17:00 R. Kurtz, *Materials Issues and Facility Needs on the Pathway to Fusion Energy*  
17:45 Discussion  
18:15 Adjourn  
19:00 Banquet at Salt Creek Grille, Princeton Forrestal Village  
Rt. 1 and College Road West, Plainsboro, NJ (Across Rt. 1 from PPPL)

**Thursday, 8 September 2011.**

**Perspectives III. B. Kuteev, Chair**

- 08:30 H. Yamada, *Current Status of Discussion on Roadmap of Fusion Energy Research and Development in Japan*
- 09:15 J. Sheffield, *Path to a High-Availability MFE Power Plant*
- 10:00 Break

**Technology II. B. Kuteev, Chair**

- 10:15 D. Stork, *Technical Challenges on the Path to Demo*
- 11:15 M. Abdou, *Fusion Nuclear Science and Technology Issues, Facilities, and Challenges on the Path to Demo*
- 12:00 Discussion
- 12:15 Lunch

**Technology III. J. Li, Chair**

- 13:30 F. Najmabadi, *Fusion Science and Technology Challenges on the Path to Demo*
- 14:15 C. Wong, *Design Limits of Helium-Cooled Large Area First Wall*
- 15:00 Break
- 15:15 D. Rasmussen, *Efficient Heating, Current Drive, and Fueling for Demo*
- 16:00 E. Diegele, *IFMIF- Necessity and Status of Preparations*
- 16:45 Adjourn to Posters

**Posters I.**

- B. Kuteev, *Fusion for Neutrons as a Necessary Step to Commercial Fusion*
- H.J.Kim, *R&D Facilities of Korea, Planned in ITER Era*
- E. Tsitrone, *The ITER Era: the 10-Year Roadmap for the French Fusion Programme*
- N. Lopes Cardozo, *The Place of Fusion in the Clean Energy Spectrum*
- 18:15 Adjourn

**Friday, 9 September 2011.**

**Integration/Optimization I: Physics Basis Mini-Session. H. Yamada, Chair**

- 08:30 H. Zohm, *Assessment of Demo Challenges by the German Demo Working Group*
- 09:15 M. Zarnstorff, *Prospects and Risk Tradeoffs for Steady-State MFE Configurations*
- 10:00 Discussion
- 10:30 Break

**Integration/Optimization II. H. Yamada, Chair**

- 10:45 D. Ward, *Assumptions, Options, and Risks for an MFE Demo*
- 11:30 C. Day, R. Wolf, *An Integrated View on High Density Plasma Operation and Fuel Cycle*
- 12:15 Discussion
- 12:30 Lunch

**Integration/Optimization II. / Facilities I. M. Kwon, Chair**

- 13:45 C. Beidler, *A Stellarator Demo and Fusion Power Plant Based on the HELIAS Concept*
- 14:15 W. Biel, *An Approach towards Different Design Options for DEMO*
- 14:45 Break
- 15:00 A. Sagara, *Force Free Helical Reactor*
- 15:45 Discussion of Workshop Questions & Follow-up
- 16:30 Adjourn to Posters

**Posters II.**

- T. Goto, *Development of System Code for a Helical Fusion Reactor*
- R. Goldston, *Plasma-Materials Interactions: Mission Risks, Current Data Status and Future Data Sources*
- L. Boccaccini and A. Kallenbach, *An Integrated View on Plasma Power Exhaust and In-vessel Components*
- G. Wurden, *Dealing with the Risk and Consequences of Disruptions in Large Tokamaks*
- A. Sternlieb, *et al.*, *R&D Roadmap to Generate the Database for a Liquid Lithium Wall/Divertor Option for a Next Step Nuclear Facility*
- 18:15 Adjourn

**Saturday, 10 September 2011.**

**Facilities II. M. Abdou, Chair**

- 08:30 M. Peng, *Fusion Nuclear Science Facility Based on the ST*
- 09:15 A. Garofalo, *Fusion Nuclear Science Facility Based on the AT*
- 10:00 Break.
- 10:15 H. Neilson, *A Pilot Plant Option for the MFE Roadmap*

**Summaries. S. Cowley, Chair**

- 11:00 G. Federici, *Technology: Basis, Gaps, Risks, and Facility Needs*
- 11:20 R. Wolf, *Physics-Technology Integration and Optimization: Basis, Gaps, Risks, and Facility Needs*
- 11:40 J. Li, *Major Facilities on the Path to Demo: Missions, Requirements, and Risks*
- 12:00 D. Maisonnier, *Perspectives on Demo and the Roadmap to Demo*
- 12:20 Discussion
- 12:30 Adjourn
- 14:00 PPPL Tour