

Summary of 2009  
Japan / US Workshop  
on  
Fusion Power Plants and Related Advanced Technologies  
with  
participation from China

March 16 - 18, 2009  
University of Tokyo  
Kashiwa, Japan

<http://www-ferp.ucsd.edu/LIB/MEETINGS/0903-USJ-PPS/>

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# History of 11 US/JA Workshops over past 15 years

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**2009** Japan/US Workshop on Power Plant Studies and Advanced Technologies with **China** participation  
16-18, March 2009, **University of Tokyo** (Kashiwa Campus)

**2008** US/Japan Workshop on Power Plant Studies and Advanced Technologies with EU participation  
5-7 March 2008, **San Diego**, CA

**2007** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
5-7 February 2007, **Kyoto**, Japan

**2006** US/Japan Workshop on Power Plant Studies and Advanced Technologies with EU participation  
23-24 January 2006, **San Diego**, CA

**2005** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
11-13 January 2005, **Tokyo**, Japan

**2003** US/Japan Workshop on Power Plant Studies and Advanced Technologies with EU participation  
9-11 October 2003, **San Diego**, CA

**2002** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
6-7 April 2002, **San Diego**, CA

**2001** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
29-31 March 2001, **Tokyo**, Japan

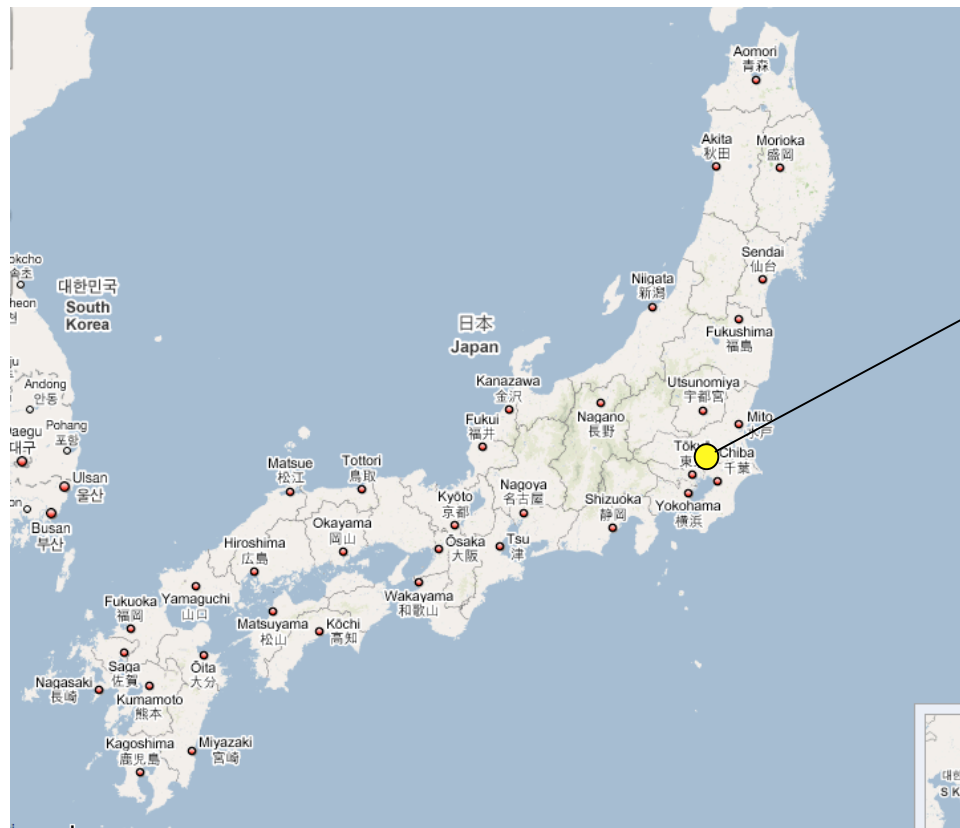
**2000** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
16-18 March 2000, **San Diego**, CA

**1999** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
24-26 March 1999, **Kyoto**, Japan

**1995** Japan/US Workshop on Power Plant Studies and Advanced Technologies with EU participation  
13-16 March 1995, **Kyoto**, Japan

# March 16-18, 2009 Workshop

- University of Tokyo, Kashiwa (~2 hr NE of Tokyo)
  - New campus, built in 2006
  - Several research institutes focusing on materials, HT plasma, energy, environment, life science, cosmic rays, solid state physics, and others.
  - 2,000 Grad students
  - 500 Faculty/researchers



**Kashiwa**  
(NE of Tokyo)



# March 16-18, 2009 Workshop (Cont.)

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- **~ 26 attendees:**
  - 19 from Japan
  - 4 from China
  - 3 from US
  - ? from Korea
  - None from EU.
- **26 presentations + lab tour**
  - **2 IFE** (from JA)
  - **24 MFE:**
    - 19 on Tokamaks, 5 on Stellarators
      - 14 from JA
      - 7 from US (2 Farrokh, 2 Rene, 3 Laila)
      - 3 from China



# Group Photo





# March 16 Agenda

<http://www-ferp.ucsd.edu/LIB/MEETINGS/0903-USJ-PPS/>

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## Monday, March 16, 2009

9:30 – 9:45 Welcome and Opening remarks

**Session : Overview of Tokamak Fusion Reactor** ( Chair : A. Sagara)

9:45 – 10:15 **K. Tobita** : What we have learned from SlimCS design study

10:15 – 10:45 **F. Najmabadi** : Use of TRL's in Defining Research Gaps and Guiding R&D for Fusion Technology

10:45 – 11:15 **Q. Huang** : FDS Series Fusion Reactor Conceptual Designs and R&D Activities in China

11:15 – 11:45 **S. Konishi** : Non-nuclear Hybrid concept with fuel production

**Lunch**

**Session : Divertor and Material Issues** (Chair : Y. Ogawa)

13:00 – 13:30 **R. Raffray**: Summary of International High Heat Flux Component Workshop, San Diego, December 2008

13:30 – 14:00 **N. Asakura** : Power exhaust and divertor physics issues for DEMO

14:00 – 14:30 **R. Hiwatari** : Divertor analysis and its related issue for DEMO

**Coffee Break**

14:45 – 15:15 **S. Zhu** : Effect of higher-Z impurity seeding on divertor plasmas

15:15 – 15:45 **R. Raffray**: Recent ARIES Progress on Developing He-Cooled W-Alloy Divertor Concepts

15:45 – 16:15 **L. El-Guebaly**: State-Of-The-Art Scheme for Managing Fusion Activated Materials:  
US Strategy and Regulations

**Coffee Break**

**Session : Helical Reactor Design (1)** ( Chair : F. Najmabadi)

16:30 – 17:00 **A. Sagara** : Overview of FFHR design activity

17:00 – 17:30 **S. Imagawa** : Magnet design of FFHR

19:00 – 21:00 **Welcome Dinner ( nearby JR Kashiwa station )**



# March 17 Agenda

## Tuesday, March 17, 2009

### **Session : Core Plasma Issues** (Chair : R. Raffray)

- 09:30 – 10:00 **K. Kurita** : Critical Beta Analyses of Low Aspect Ratio Tokamak
- 10:00 – 10:30 **K. Okano** : High beta and high bootstrap current equilibria with internal and external transport barriers
- 10:30 – 11:00 **F. Najmabadi** : New ARIES System Code Development and Validation
- 11:00 – 11:30 **Y. Ogawa** : Consideration on design window for a DEMO reactor
- 11:30 – 12:00 **L. El-Guebaly** : Toward the Ultimate Goal of Tritium Self-Sufficiency: Technical Issues and Requirements Imposed on ARIES Advanced Power Plants

### **Lunch**

- 13:00 – 14:45 **Tour to Plasma Experimental Devices in Kashiwa Campus**

### **Session : Helical Reactor Design (2)** ( Chair : K. Okano)

- 15:00 – 15:30 **T. Goto** : Development of System Design Code for Heliotron Reactors
- 15:30 – 16:00 **O. Mitarai** : Low temperature and high density ignited operation in FFHR
- 16:00 – 16:30 **Y. Kozaki** : Economic aspect of helical reactors

### **Coffee Break**

### **Session : Laser Fusion Reactor Design** (Chair : O. Mitarai)

- 16:45 – 17:15 **T. Norimatsu** : Critical issue in KOYO-F design
- 17:15 – 17:45 **Y. Someya** : Nucleus designs of final optical system and blanket system for a fast ignition ICF reactor FALCON-D



# March 18 Agenda

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**Wednesday, March 18, 2007**

**Session : Blanket Issues** ( Chair : K. Tobita )

- 09:00 – 09:30 **L. El-Guebaly**: Scoping Assessment of Advanced Tokamak with DCLL Blanket:  
Design Challenges and Economic Implications
- 09:30 – 10:00 **S. Nishio** : Prospects for fusion power density from view points of plasma, blanket  
and divertor issues
- 10:00 – 10:30 **M. Ichinose** : Design concept of near term DEMO reactor with high temperature blanket
- 10:30 – 11:00 **Y. Yamamoto** : Development of High temperature LiPb-SiC blanket
- 11:00 – 11:30 **C. Liu** : Research on thermo-hydraulic analysis of DEMO blanket
- 11:30 – 11:40 Closing Address  
**Adjourn**