



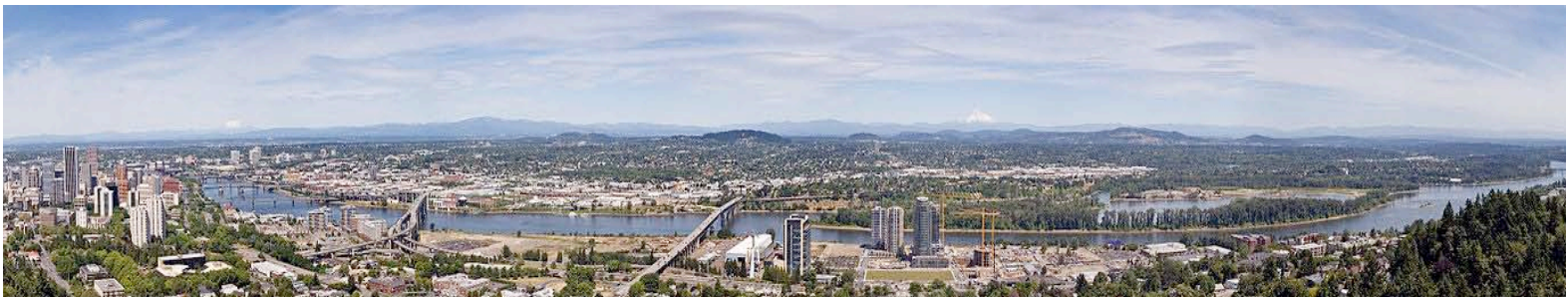
Portland, Oregon • 2011

# **10<sup>th</sup> International Symposium on Fusion Nuclear Technology**

11-16 September 2011

Portland, Oregon, USA

## **Program Book**



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## Welcome

The organizers of the 10<sup>th</sup> International Symposium on Fusion Nuclear Technology (ISFNT-10) welcome you to this symposium. The ISFNT is recognized as one of the premier gatherings for the international exchange of technical information on all aspects of fusion nuclear technology. The symposium addresses near-term fusion devices and long-term reactor technologies, as well as fostering international collaboration for the promotion of fusion energy development. This tenth symposium of the series follows these previous meetings:

ISFNT-1	Tokyo	Japan	April	1988
ISFNT-2	Karlsruhe	Germany	June	1991
ISFNT-3	Los Angeles	USA	June	1994
ISFNT-4	Tokyo	Japan	April	1997
ISFNT-5	Rome	Italy	September	1999
ISFNT-6	San Diego	USA	April	2002
ISFNT-7	Tokyo	Japan	May	2005
ISFNT-8	Heidelberg	Germany	October	2007
ISFNT-9	Dalian	China	October	2009

ISFNT addresses the technical aspects of fusion nuclear technology, with a focus on these topic areas:

1. First-wall Technology and High Heat Flux Components
2. Blanket Technology
3. Fuel Cycle and Tritium Processing
4. Material Engineering for Fusion Nuclear Technology
5. Vacuum Vessel
6. Nuclear System Design
7. Safety Issues and Waste Management
8. Models and Experiments for Fusion Nuclear Technology
9. Repair and Maintenance
10. Burning Plasma Control and Operation
11. Inertial Confinement Fusion Studies and Technologies
12. Fission-Fusion Synergy and Cross-cutting Technologies

ISFNT-10 collected 410 abstracts, and ~16% of these will be oral presentations. The symposium offers the opportunity for open exchange of ideas and information on fusion issues. We thank you for supporting the symposium and we welcome all participants.

The Local Organizing Committee

## Committees and Sponsors

### Symposium Committee

Honorary Chair	Dr. M. Abdou (UCLA, USA)
General Chair	Dr. K. A. McCarthy (INL, USA)
Scientific Secretary	Mr. B. J. Merrill (INL, USA)
Publication Co-Chairs	Dr. P. W. Humrickhouse (INL, USA)
	Dr. M. Shimada (INL, USA)

Local Organizing Committee	Mr. L. C. Cadwallader (Chair, INL, USA)
	Ms. S. Mitcheltree (ConferenceDirect, USA)
	Ms. S. Eddins (INL, USA)
	Ms. T. Smith (INL, USA)
	Ms. J. Baker (INL, USA)
	Ms. B. Monson (INL, USA)

### ISFNT International Standing Committee

H. Takatsu	JAEA, Japan, Chair	R. Lässer	F4E, Spain
M. Abdou	UCLA, USA	J. Li	ASIPP, China
L. Boccaccini	KIT, Germany	D. Maisonnier	EC, EU
L. Cadwallader	INL, USA, observer	I. Mazul	Efremov, RF
S. Cho	NFRI, Korea	K. McCarthy	INL, USA
V. Chuyanov	ITER IO, France	W. Meier	LLNL, USA
S. Deshpande	IPR, India	N. Morley	UCLA, USA
K. Feng	SWIP, China	C. Pan	SWIP, China
M. Gasparotto	F4E, Spain	Y. Poitevin	F4E, Spain
L. Giancarli	ITER IO, France	P. Sharpe	GE Hitachi, USA
T. Hayashi	JAEA, Japan	Y. Strebkov	NIKIET, RF
B. Hong	KAERI, Korea	S. Tanaka	Tokyo U., Japan
G. Janeschitz	ITER IO, France	Y. Wan	USTC, China
A. Kohyama	Kyoto U., Japan	Y. Wu	ASIPP, China
E. R. Kumar	IPR, India		

## ISFNT International Program Committee

M. Y. Ahn	NFRI, Korea	T. Nishitani	JAEA, Japan
P. Batistoni	ENEA, Italy	R. Nygren	SNL, USA
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Q. Huang	ASIPP, China	A. Sagara	NIFS, Japan
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G. M. Kalinin	ENTEC, Russia	S. Suzuki	JAEA, Japan
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R. Kurtz	PNNL, USA	M. Q. Tran	EPFL, China
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D. W. Lee	KAERI, Korea	M. Ulrickson	SNL, USA
S. Lee	NFRI, Korea	F. Wan	USTB, China
D. Luo	CAEP, China	S. Willms	LANL, USA
M. Merola	ITER IO, France	C. P. C. Wong	GA, USA
A. Mineev	Efremov, Russia	T. Yamanishi	JAEA, Japan
M. Ni	CAS, China	A. Ying	UCLA, USA

### Sponsors

This symposium has been organized by the Fusion Safety Program at the Idaho National Laboratory with the permission of the US Department of Energy. The fusion staff at the University of California-Los Angeles has supported the organizers.

## **Venue and Attendee Information**

The symposium is held in the Red Lion Hotel on the River at Jantzen Beach in Portland, Oregon. A map of the hotel is on the last page of the Program Book, it shows the rooms used for the symposium and satellite meetings.

The Registration Desk and Conference Office will be in the hotel lobby on Sunday, September 11, opening at noon and closing at 9:00 pm when the welcome session ends. Registration will open on September 12 from 7:30 am to 5:00 pm in the lobby. Then the Registration Desk and Conference Office will move to the Pendleton room on the lower level.

Poster presenters are asked to set up their posters in the Mt. St. Helens Ballroom in the morning of the conference day, before sessions begin at 8:30 am, so that all attendees can view the posters throughout the day. Poster presenters on Wednesday are asked to set their posters up in the morning or after the Portland Spirit docks at the hotel. All poster presenters are asked to take down their posters at the end of the poster session, which is the end of the conference day.

Oral presenters are asked to turn in their presentations at the Registration Desk or Conference Office the day before they speak so that the presentations can be tested and cued to the proper session.

Attendees are asked to wear their name badges each day of the symposium. Only persons with name badges are admitted to symposium sessions. Those attendees who are taking the Portland Spirit cruise are asked to wear their name badges to comply with Oregon State law for watercraft.

The official language of ISFNT-10 is English. Papers to be published in Fusion Engineering and Design journal will be published in English.

All attendees are invited to the Welcome/opening session on Sunday evening in the Mt. St. Helens Ballroom from 7:00 pm to 9:00 pm. Attendees who have a ticket for the Portland Spirit cruise on Wednesday are invited to board buses at 7:30 am at the Banquet Entrance; the buses will convey our group to the ship's berth at Salmon Street. After the cruise around Portland on the Willamette and Columbia Rivers, the ship will dock at the Red Lion Hotel on the River. Then we shall have a conference group photo before disembarking. Attendees who have purchased a ticket for the Working Dinner at the Portland Art Museum (PAM) are invited to board buses at 6:30 pm at the Banquet Entrance to travel downtown to the PAM. Buses will return attendees to the hotel after the evening session is completed.

An Automated Teller Machine (ATM) is available in the hotel lobby. Another is available at the Wells Fargo bank branch building adjacent to the hotel parking lot. There is a currency exchange kiosk at the Portland International Airport.

## Technical Program Daily Schedule

**Monday, September 12, 2011**

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Symposium Keynote Session 1, Grand Ballroom  
Session chairs: Kathy McCarthy, Brad Merrill

8:30 – 8:40	Greeting and Opening	Mr. Brad Merrill
8:40 – 9:00	INL Overview	Dr. Kathryn McCarthy
9:00 – 9:15	Role and History of ISFNT	Dr. Hideyuki Takatsu
9:15 – 10:00	Overview of the ITER Project	Dr. Mitsunori Kondoh

Break

Symposium Keynote Session 2, Grand Ballroom  
Session chairs: Mohamed Abdou, Hideyuki Takatsu

10:30-11:15	A Vision for Fusion Energy Sciences Research in the U.S.	Dr. Ed Synakowski
11:15-12:00	Overview of Fusion Program in China	Dr. Yuanxi Wan

Lunch

Oral Session 1, ITER Technology, Grand Ballroom West  
Session chairs: Rene Raffray, Jeff Latkowski

1:30 – 2:00	Remote Handling of ITER Blanket	Dr. Senji Mori
2:00 – 2:30	Russian Development of Enhanced Heat Flux Technologies for ITER First Wall	Dr. Igor Mazul
2:30 – 3:00	Design and Procurement Process of the ITER Thermal Shields	Dr. Yuri Utin
3:00 – 3:30	Optimization of Hot Isostatic Pressing Bonded Joints SS/SS Conditions for ITER Shield Blanket	Dr. Isabelle Bobin-Vastra

Oral Session 3, Neutronics, Timberline Room  
Session chairs: Mohamed Sawan, Michael Loughlin

1:30 – 2:00	The Impact of Nuclear Analysis on ITER Design and Licensing	Dr. Michael Loughlin
2:00 – 2:30	Final Results on a Neutronics Experiment on a HCLL Blanket Mock-up	Dr. Paola Batistoni
2:30 – 3:00	Neutronics Analysis of the IVVS/GDC Plug in ITER	Dr. Ulrich Fischer
3:00 – 3:30	State-of-the-Art 3-D Assessment of Design Elements Degrading TBR of DCLL Blanket	Dr. Laila El-Guebaly

Monday, September 12, 2011

Oral Session 5, Blanket Development, Grand Ballroom East

Session chairs: Lorenzo Boccaccini, Mikio Enoeda

1:30 – 2:00	Progress of Liquid Breeder Blankets in China	Dr. Yican Wu
2:00 – 2:30	R&D Progress of Korean HCSB TBM	Seungyon Cho
2:30 – 3:00	Overview of the TBM R&D Activities in India	Rajendra K. Ellappan
3:00 – 3:30	Status of Ceramic Breeder Pebble Bed Thermo-mechanics R&D and Impact on Breeder Material Mechanical Strength	Dr. Alice Ying

Break

Oral Session 2, The US/Japan TITAN Program, Grand Ballroom West

Session chairs: Takeo Muroga, Dai Kai Sze

4:00 – 4:30	Overview of TITAN Project	Dr. Takeo Muroga
4:30 – 5:00	Deuterium Permeation in Tungsten by Mixed Ion Irradiation	Dr. Yoshio Ueda
5:00 – 5:30	The Effect of Paramagnetic (or Diamagnetic) Shift during Thermal Quench on Internal Components of Fusion Devices	Dr. Michael Ulrickson
5:30 – 6:00	Recent Results from the TITAN Project	Dr. Dai Kai Sze

Oral Session 4, Fusion Code Development, Grand Ballroom East

Session chairs: Tomoaki Kunugi, Shinchi Satake

4:00 – 4:30	Recent Advances in Computational Techniques for MHD Fluid Flow and Applications to Fusion	Dr. Ming-jiu Ni
4:30 – 5:00	Models, Codes and Analysis to Address MHD/ Heat & Mass Transfer Processes in LM Blankets	Dr. Sergey Smolentsev
5:00 – 5:30	Towards a Zero Lost Particle Guarantee	Dr. Paul Wilson
5:30 – 6:00	Development of 4-Dimensional System for Integrated Design and Simulation of Advanced Reactors	Dr. Pengcheng Long

Monday, September 12, 2011

Oral Session 6, Safety, Timberline Room

Session chairs: Laila El-Guebaly, Lee Cadwallader

- |             |   |                        |
|-------------|---|------------------------|
| 4:00 – 4:30 | Overview of the Specialist Assessments Undertaken to Support the JET Safety Case Review     | Dr. Joelle Vallory     |
| 4:30 – 5:00 | Shutdown Dose Rate Benchmark Experiment at JET  | Dr. Rosaria Villari    |
| 5:00 – 5:30 | Development of Shutdown Dose Rates Calculation Code and Its Application to the EAST Tokamak | Dr. LiangLiang Wu      |
| 5:30 – 6:00 | Safety Approach in the EU Test Blanket Systems Design                                       | Dr. Dobromir Panayotov |

## **Tuesday, September 13, 2011**

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Plenary Session 1, Grand Ballroom

Session chairs: Michael Ulrickson, Kimihiro Ioki

- |             |  |                    |
|-------------|--|--------------------|
| 8:30 – 9:05 | Overview of Recent Fusion Technology Activities in Japan | Dr. Masato Akiba   |
| 9:05 – 9:40 | Overview of the ITER D/T Fuel Cycle Systems              | Dr. Manfred Glugla |

Break

Plenary Session 2, Grand Ballroom

Session chairs: Yican Wu, Luis Sedano

- |               |  |                       |
|---------------|--|-----------------------|
| 10:15 – 10:50 | Overview of ITER TBM Program   | Dr. Luciano Giancarli |
| 10:50 – 11:25 | Progress in the Fusion Nuclear Technology on the Broader Approach Project        | Dr. Takeo Nishitani   |
| 11:25 – 12:00 | Development and Application of High Volume RH Systems in Support of JET and ITER | Dr. Tony Loving       |

Lunch

Tuesday, September 13, 2011

Oral Session 7, Fuel Cycle Systems, Grand Ballroom West

Session Chairs: Manfred Glugla, Romain Pascal

- |             |   |                         |
|-------------|---|-------------------------|
| 1:30 – 2:00 | Design Development of Cryo-pumping Systems for ITER in View of Future DT Fusion Devices | Dr. Christian Day       |
| 2:00 – 2:30 | Overview of the Fuel Cycle and Tritium Processing Technology                            | Dr. Toshihiko Yamanishi |
| 2:30 – 3:00 | A Description of the ITER Gas Injection Systems and their Development                   | Dr. Li Wei              |
| 3:00 – 3:30 | Progress of China's TBM Tritium Technology  | Dr. Luo Deli            |

Tuesday, September 13, 2011

Oral Session 8, ITER Test Blanket Module, Grand Ballroom East

Session chairs: Luciano Giancarli, Seungyon Cho

- |             |   |                        |
|-------------|---|------------------------|
| 1:30 – 2:00 | Scientific Evaluation of TBM Testing in ITER                              | Dr. Neil Morley        |
| 2:00 – 2:30 | Progresses in the European Test Blanket Modules Systems for ITER          | Dr. Lorenzo Boccaccini |
| 2:30 – 3:00 | Progress on Design and R&D for Helium-cooled Ceramic Breeder TBM at China | Dr. Kaiming Feng       |
| 3:00 – 3:30 | Development of the Water Cooled Ceramic Breeder TBM                       | Dr. Mikio Enoeda       |

Oral Session 9, Blanket Design, Timberline Room

Session Chairs: Akio Sagara, Takayoshi Norimatsu

- |             |   |                      |
|-------------|---|----------------------|
| 1:30 – 2:00 | Progress in the Spanish Program for Dual-Coolant Advanced Breeding Blanket  | Dr. Luis Sedano      |
| 2:00 – 2:30 | Beyond TBM Toward DEMO, Strategy and Technical Issues to Solve, Including Overview of the Current Technical Development and Proposals | Dr. Satoshi Konishi  |
| 2:30 – 3:00 | R&D Activities of Liquid Breeder Blanket in Korea   | Dr. Dong Won Lee     |
| 3:00 – 3:30 | LiPb 900 Degree Blanket Study and Recent Results  | Dr. Yasushi Yamamoto |

Note: the afternoon break will be served from 3:30 to 4:00 during the poster session.

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Dr. Michael Rieth	A Cost-effective, Large-scale and Fail-safe First Wall Fabrication Method	001
Dr. Jean Boscary	Design Improvement of the Target Elements of Wendelstein 7-X Divertor	002
Mr. Slim Constans	Infrared True Temperature Measurement at FE200 Facility	003
Dr. Yuming Chen	Thermo-hydraulic Simulations on IFMIF High Flux Test Module	004
Mrs. Isabelle Bobin	Manufacture of First Wall Mock-ups with Calibrated Defects for the Development of Fabrication Control Methods	005
Mr. Thorsten W. Loewenhoff	Tungsten and CFC Degradation under Combined High Cycle Transient and Steady State Heat Loads	006
Mr. Xueren Wang	Recent Improvements of the Helium-Cooled W-based Divertor for Fusion Power Plants	007
Mr. Shinichiro Ishikawa	Desorption Behavior of Hydrogen Isotopes from Tungsten Deposit caused by Plasma Exposure	008
Dr. Arnold Lumsdaine	Thermal Fluid Multiphysics Optimization of Spherical Torus Centerpost	009
Dr. Yuji Hatano	Measurements of H, D and He in Plasma-Facing Materials by Glow-Discharge Optical Emission Spectroscopy	010
Dr. Yuji Hatano	Measurement of Tritium Concentration in Water with Imaging Plate	011
Mr. Do-Hyoung Kim	Design and Analysis of High Temperature Divertor Component for Biomass Hybrid Fusion Reactor: GNOME	012
Dr. Igor B. Kupriyanov	Progress in High Thermal Energy Load testing of Beryllium for ITER First Wall Application	013
Mr. Takaaki Wada	Structure and Retention Characteristics of C/W Codeposition Film	014
Dr. Masashi Shimada	Overview of the US-Japan Collaborative Investigation on Hydrogen Isotope Retention in Neutron-Irradiated and Ion-damaged Tungsten	015
Dr. Masashi Shimada	Tritium Plasma Experiment for Fusion Nuclear Science Studies	016
Dr. Xiang Ji	Structural and Thermal Analysis of the EAST First Wall Molybdenum (Mo) Tile Armour	017
Dr. Xiang Ji	The Design and Assemble of Protecting Structure for Cooling Water Tubes at EAST Divertor	018

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Mr. D. Mandal	Study of Hydrodynamics of Packed-bed Fluidization of Binary Lithium-Titanate Pebbles	019
Dr. Duck-Hoi Kim	Cooling Optimization for Preliminary Design of ITER Blanket Shield Block	020
Dr. Hans J. Konys	Impact of Heat Treatment on the Behavior of Al-based Anti-corrosion and T Permeation Barriers in a Flowing Pb-15.7 Environment	021
Dr. Victor Kapyshev	On Monitoring the Tritium Breeder in Lead-Lithium Cooled Ceramic Breeder (LLCB) Module of ITER	022
Dr. Hongyan Wang	Analysis of LiPb Slug Flow inside Channel with Thin Wall in the SLL Blanket	023
Mr. Guoshu Zhang	Application of Structured Porous Media on Helium Coolant Pebble Bed	024
Dr. Ming-Jiu Ni	The Influence of Flow Channel Insert with Pressure Equalization Opening (Holes and Slots) on MHD Flows in Dual Coolant Lead Lithium Blanket	025
Dr. Romain Pascal	Progress in the Integration of Test Blanket Systems in ITER Equatorial Port Cells and in the Interfaces Definition	026
Dr. Mu-Young Ahn	Design Update of Korean Helium Cooled Solid Breeder TBM in Vertical Arrangement	027
Mr. Christian Zeile	A Revised Design Approach of the Attachment System for the ITER EU-HCPB-TBM Based on a Central Cylindrical Connection Element	028
Mr. Jin Qiang	Design and Optimization Analysis on Improving Heat Transfer for the First Wall of DFLL-TBM in ITER	029
Mr. Chen Yunlong	Preliminary Simulation and Analysis of Flow Fields in the Cold Trap of DRAGON-IV Loop	030
Dr. Kentaro Ochiai	Tritium Recovery Online Experiment for $\text{Li}_2\text{TiO}_3$ Pebble Blanket under DT Neutron Irradiation	031
Mr. Zi Meng	Code Development for the Calculation of Magnetohydrodynamic Flow at High Hartmann Number Based on Unstructured Mesh	032
Dr. Ali Abou-Sena	Experimental Measurements of the Purge Gas Pressure Drop across Different Pebble Beds for the HCPB Blanket	033
Dr. Takahiko Sugiyama	Lithium Isotope Separation with Displacement Chromatography using Crown Ether Resin Immobilised on Porous Silica Beads	034
Dr. Takahiko Sugiyama	Transient Response Simulation of Tritium Removal with Gas Separation Membrane	035

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Mr. Kouichi Satori	Hybrid SiC Plates Produced by NITE-method for Thermal Insulators on DCLL Blanket System	036
Ms. Iole Palermo	Octalithium Plumbate as Breeding Blanket Ceramic: Neutronic Performances, Synthesis and Partial Characterisation	037
Mr. Iván Fernández	Design Analyses of a Thin-plate Lead-lithium/SC_CO <sub>2</sub> Heat Exchanger at DEMO Power Conversion Ranges	038
Dr. Haibo Liu	ATTILA Application to ITER Test Blanket Module and Shielding Block Nuclear Design Analysis	039
Mr. Jack N. Young	Experimental Study of the Transition between 3D and 2D MHD Flows in Insulated Ducts with a Transverse Magnetic Field	040
Dr. Seolha Kim	Numerical Analysis Code Validation and System Code Development for MHD Analysis in the Liquid Metal Breeder Flow in Korean TBM	041
Dr. Hongsuk Chung	Fusion Tritium Research Facilities in KAERI	042
Dr. Yasunori Iwai	Change in Activity of Catalysts for the Oxidation of Tritium during a Fire Event	043
Mr. Yusuke Hatachi	Analysis of Hydrogen Isotopes Absorption between Liquid Lithium and Yttrium under Dynamic Conditions	044
Dr. Stylianos Varoutis	Numerical Modeling of an ITER type Cryopump	045
Mr. Hiroaki Okitsu	Analysis of Hydrogen Isotopes Diffusion and Dissolution in Lead Lithium in Two Component System	046
Mr. Thomas Giegerich	Development of a Tritium Compatible Vapour Diffusion Pump for a Commercial Fusion Power Plant	047
Dr. Wei Huang	The Radiation Effect of Electron Beams on Polytetrafluoroethylene Cushions	048
Mr. Cao Wei	Deuterium Permeation Barrier by Hot-dipping Aluminum	049
Mr. Song Jiangfeng	Tritium Measurement Technologies for ITER Tritium Systems Developed in CAEP	050
Dr. Hyun-Goo Kang	In-bed Calorimetry Performance of Thin Double-layered Annulus Metal Hydride Bed	051
Dr. Xueli Luo	Monte Carlo Calculation of the Radiation Heat Load of the ITER Pre-production Cryopump	052
Dr. Yong Song	Requirement of Tritium Self-sufficient for Fusion Power Reactor FDS-II	053

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Ms. Nuria Moral	Understanding and Modeling the Behavior of Hydrogen Isotopes in a Tungsten Wall for HiPER Phase 4a	054
Mr. Pablo Miguel Martinez Alcalde	Optimizing Tritium Extraction from a Permeator Against Vacuum (PAV) by Dimensional Design Using Different Tritium Transport Modeling Tools	055
Mrs. Maria Rosa Sacristan	Design, Performance and Manufacturing Analysis for a Compact Permeator against Vacuum Concept fuskite®	056
Ms. Paloma Castro	Heat Transfer Modelling of Printed Circuit Heat Exchange for Supercritical CO <sub>2</sub> Cycles in Fusion Reactors	057
Dr. Shin-ichi Satake	Direct Numerical Simulation of Combined Forced and Natural Turbulent Convection in a Vertical Plane Channel under a Magnetic Field	058
Ms. Haiying Fu	Mechanical Properties Study of Fine-grained Particle-dispersed V-4Cr-4Ti Alloys	059
Dr. Matthias Kolb	Synthesis of Tritium Breeder Ceramics from Metallic Lithium	060
Dr. Christine Maria Klein	Hydraulic Testing of Helium Cooled Irradiation Rigs of the IFMIF High Flux Test Module	061
Dr. Hiroo Kondo	Completion of IFMIF/EVEDA Lithium Test Loop Construction and Commissioning	062
Mr. Changho Park	The Compatibility of Tungsten Exposed to Liquid PbLi Flow for Development of Divertor Component	063
Dr. Paolo Rossi	Overview of the Testing Activities on ITER Scaled Pre-Compression Rings	064
Mr. Georg W. Schlindwein	Start-up Phase of the HELOKA-LP Low Pressure Helium Test Facility for IFMIF Irradiation Modules	065
Dr. Bo Huang	Experimental and Simulation Analysis on Hydroforming Process of the China Low Activation Martensitic Steel Rectangular Tube	066
Dr. Takashi Nozawa	Determination and Prediction of Axial/Off-axial Mechanical Properties of SiC/SiC Composites	067
Mr. Takahiro Abe	Fabrication of SiC/SiC Composite Heater by NITE-method for High Flux Test Module on IFMIF	068
Dr. Juro Yagi	Operation of Nitrogen Trapping Test Loop for IFMIF-EVEDA	069
Mr. Cheng yu Lei	Experimental Study on Pores in TIG Welding of Oxide Dispersion Strengthened (ODS) MGH956 Alloys	070
Dr. Sachiko Suzuki	Characteristics of Surface Oscillation on High Speed Liquid Li Jet	071

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Dr. HyunSoo Kim	Design of the In-Wall Shielding for the ITER Neutral Beam Ports	072
Dr. Wladi Rigato	MITICA Vacuum Vessel, Interfaces, Structural Analyses and Status of the Design	073
Dr. Junchaun Hao	Structure and Thermal Analysis for ITER In-Wall Shielding Block	074
Dr. Qing xi Yang	Mechanical Design of the Second ICRF Antenna for EAST	075
Mr. Peter Spaeh	Manufacturing Studies of Double Wall Components for the ITER EC H&CD Upper Launcher	076
Dr. Takuya Goto	Proposal of an MFE-IFE Cooperative System for a Steady-State Tritium Balance	077
Dr. Pavel Pereslavitsev	Shutdown Dose Rate Analyses for the European TBM System in ITER	078
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Dr. Tongqiang Dang	First Neutronics Analysis for ITER Bio-shield Equatorial Port Plug	081
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Dr. Xue Zhou Jin	Preliminary Safety Analysis of Ex-Vessel LOCA for the European HCPB TBM System	083
Mr. Steven Lilley	Neutronics and Activation Analyses for Updating ITER Radioactive Waste Assessment	084
Mr. Myoung-suk Kang	Design Failure Mode and Effect Analysis for Korean Fusion DEMO Plant	085
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Dr. Hiroko Ohuchi-Yoshida	Tritium Depth Profile in Matter Using an Imaging Plate	090

Tuesday, September 13, 2011

Poster Session 1, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Brad Merrill

<u>Author</u>	<u>Poster Title</u>	<u>Poster number</u>
Mr. Petr Kurinskiy	X-Ray Study of Surface Layers of Air-annealed Be <sub>12</sub> Ti and Be <sub>12</sub> V Samples using Synchrotron Radiation	091
Mr. Lee W. Packer	UK Fusion Technology Experimental Activities at the ASP 14 MeV Neutron Irradiation Facility	092
Dr. Sergey Peschanyy	Verification of TOKES Simulations against the MGI Experiments in JET	093
Dr. Dieter Leichtle	Verification and Validation of the R2Smesh Approach for the Calculation of High Resolution Shutdown Dose Rate Distributions	094
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Dr. Alberto Beltran	Development and Comparison Study of MHD Computational Tools for Blanket Applications	096
Mr. Motohiro Sato	Validation and Verification of Prediction Models of Fusion Materials under Irradiation by STM Combined by an Ion Accelerator	097
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Dr. Andrey Leshukov	Overview of RF Activity on the LLCB TBM Design and Analysis	099
Dr. Yi-Kang Lee	Analysis of the D-T Neutron Narrow Gaps Streaming Experiment for ITER with TRIPOLI-4 Monte Carlo Code	100
Dr. Cornelis Heemskerk	Analysis of ITER Upper Port Plug Remote Handling Maintenance Scenarios	101
Mr. Pengcheng Qiao	The Conceptual Design of a Folding Inspection Rod for the EAST PFCs	102
Ms. Gwendolijn Schropp	On the Influence of Visual Feedback on Human Task Performing in Remote Handling	103
Mr. Xuebing Peng	Kinematic and Dynamic Simulation of Series-wound Robot for Inspection Process in EAST Vacuum Vessel	104
Mr. Laurent Gargiulo	Mini-invasive Remote Operations: A Need for Fusion Machines Exploitation	105
Dr. M. D. Mathew	Creep Properties of 9Cr Ferritic-Martensitic Steels for Fission and Fusion Applications	106
Mr. Kentaro Matsui	Evaluation of Advanced Flibe Blanket using Cs-137	107
Dr. Didier van Houtte	A Functional Approach for Managing ITER Operations and Machine Availability	108
Dr. Carl M. Stoots	Highlights of Experimental Activities at STAR	109

## **Wednesday, September 14, 2011**

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Continental breakfast cruise on the Portland Spirit, board buses at the Red Lion Hotel Banquet Entrance beginning at 7:30 am. The Portland Spirit will dock at the hotel after 11:30 am.

Plenary Session 3, Grand Ballroom  
Session chairs: Yuanxi Wan, Clement Wong

1:30 – 2:05	Overview of Progress and Plans of the NSTX Facility	Dr. Jonathan Menard
2:05 – 2:40	The JET Programme in Support of ITER	Dr. Lorne Horton
2:40 – 3:15	Overview of Recent Developments in Pellet Injection for ITER	Mr. Stephen Combs

Note: the afternoon break will be served from 3:15 to 3:45, during the poster session.

Wednesday, September 14, 2011

Poster Session 2, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Lee Cadwallader

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Dr. Maksim N. Sviridenko	Thermal Mechanical Analysis of the EHF FW Panel	001
Dr. Yang-Il Jung	Fabrication of the Small Mock-ups reflecting Design Features of the ITER Semi-Prototype	002
Dr. Marek J. Rubel	Overview of Fuel Removal Methods from Plasma-Facing Components	003
Dr. Joseph D. Kotulski	The Reduction of Eddy Current Loads due to Plasma Disruption on Selected ITER Shield Modules through the Optimization of Eddy Current Slits	004
Dr. Yuntao Song	Design, Fabrication and Assembly of EAST Passive Stabilization Loop	005
Dr. Eliseo Visca	Manufacturing and Testing of a HETS Module for DEMO Divertor	006
Mr. Zhong Wei Wang	Design and Optimization of the Hypervapotron Module for the EAST Device	007
Dr. Kazuhisa Yuki	Heat Transfer Characteristics of Sub-Channels-Inserted Porous Media for Divertor Cooling	008
Prof. Roberto Zanino	CFD Analysis of Flow Boiling in the ITER First Wall	009
Dr. Suk-Kwon Kim	Korean High Heat Flux Test Facility by Using Electron Beam System for ITER First Wall Semi-Prototype	010
Dr. YiPing Chen	Modelling Studies for the Divertor Design to Reduce Heat Flux at Target Plates in FDS-III Fusion Reactor	011
Mr. Prachai Norajitra	He-cooled DEMO Divertor: Design Verification Testing against Impact Loads	012
Mr. Masato Suzuki	Recycling and Retention Behaviors of Hydrogen Isotopes Implanted into Tungsten-Carbon Mixed Layer	013
Ms. Akiko Hamada	Study on Retention Behavior of Hydrogen Isotopes and Change of Chemical States of Boron Film Exposed by H-H Plasma in LHD	014
Dr. Kyoung-Jae Chung	Characterization of a Plasma Gun for Simulating the Heat Loads during Edge Localized Mode	015

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Poster Session 2, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Lee Cadwallader

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Mr. Sanjay Kumar	Corrosion of 9Cr 1Mo Ferritic Steel in Static Pb83Li17 Melts Alloys	016
Dr. Bostjan Koncar	Cyclic Surface Heating of the Cooling Finger Mockup	017
Dr. Selanna Roccella	Ultrasonic Test of Carbon Composite/Copper Joints in the ITER Divertor	018
Dr. Victor Kovalenko	RF DEMO Helium Cooled Ceramic Breeder Blanket	019
Mr. V. V. S. D. Ratna Kumar Annabattula	Mechanics of Polydisperse Spherical Pebble Assembly	020
Dr. Jing Zhao	Study of Thorium-Uranium Based Molten Salt Blanket in a Fusion-Fission Symbiotic Reactor	021
Dr. Masaru Nakamichi	Development of Synthesis Method of Beryllides as Advanced Neutron Multiplier for DEMO Reactors	022
Dr. Hu Gang	Updated Design of Chinese HCCB TBM	023
Ms. Chan Tang	Research of Convection and Heat Transfer in the Single-coolant Lithium Lead Blanket for ITER	024
Dr. Kazunari Katayama	Release Behavior of Water Vapor and Mass Loss from Lithium Titanate	025
Mr. Francisco Hernandez	Thermo-mechanical Analyses and Assessment with Respect the Design Codes and Standards of the HCPB Breeder Unit	026
Mrs. Sheida Saeidi	Modeling LM Corrosion in a Ferritic-Martensitic steel/PbLi System With and Without a Magnetic Field	027
Dr. Yuji Hatano	Preparation of ZrO <sub>2</sub> Coating by Electrochemical Technique and Its Application to Tritium Permeation Barrier	028
Dr. Rajendraprasad Bhattacharyay	Thermo-fluid MHD analysis for single straight channel flow in LLCB TBM	029
Mr. Zhiqiang Zhu	Analysis on the Flowing Characteristic of Liquid LiPb in DRAGON-IV Loop	030
Mrs. Qin Zeng	Impact of TBM-Set Recession on TFC Nuclear Heat and TBM Neutronics Parameters	031

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Poster Session 2, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Lee Cadwallader

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Mr. Paritosh Chaudhuri	Status and Progress of Indian LLCB Test Blanket Systems for ITER	032
Mr. Pierre Sardain	Project Management and Design Integration Activities in the European Consortium for the ITER Test Blanket Modules	033
Mr. Tetsuo Fujishima	Study of Irradiation Defects Effects on Tritium Release Process in Thermal Neutron-irradiated LiAlO <sub>2</sub>	034
Mr. Rafael Juárez	Neutronics and Safety Considerations for a Lead Lithium blanket for HiPER Reactor	035
Dr. Fabio Cismondi	About the Fundamental Role of Fluid Dynamic Analyses in the Design of the Solid EU Test Blanket Module	036
Dr. Fabio Cismondi	Segmentation of Internal Components and Impact on Maintenance for DEMO	037
Mr. Damien J. Sutevski	3D Numerical Study of Pressure Equalization in MHD Flow in a Rectangular Duct with Insulating Flow Insert	038
Dr. Mohamed Sawan	Damage Parameters of Structural Materials in Fusion Environment Compared to Fission Reactor Irradiation	039
Ms. Iole Palermo	Neutronic and Electromagnetic Design Analyses for a Dual-coolant Blanket Concept Optimization for a Fusion Reactor DEMO	040
Mr. Iván Fernández	Design, Integration & RAMI Studies for a Dual-coolant Blanket DEMO Concept	041
Mr. Fraile Alberto	New Simulations to Qualify Eutectic Lithium-Lead as Breeder Material	042
Mr. Keisuke Mukai	Grain Growth Control in Lithium Metatitanate with Excess Li	043
Dr. Sergey Smolenstev	Status of R&D in "TITAN" Task 1-3 "Flow Control and Thermofluid Modeling"	044
Mr. Ignacio P. Serrano	Numerical Modeling and Design of Supercritical CO <sub>2</sub> Pre-cooler for Fusion Nuclear Reactors	045
Dr. Masabumi Nishikawa	Tritium Balance in a DT Fusion Reactor and Effect of Outside Tritium Source	046

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Poster Session 2, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Lee Cadwallader

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
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Prof. Dezhen Wang	Molecular Dynamics Study of the Collision Process between H/CHX and Co-deposited Layer	048
Mr. Song Jiangfeng	An Advance Process of Aluminum Rich Coating as Tritium Permeation Barrier on 321 Steel Workpiece	049
Mr. Song Jiangfeng	Safety Design Considerations of China TBM Tritium System	050
Dr. Kyu-Min Song	Development of a Jacket Type Tritium Calorimeter for the Tritium Storage and Delivery System	051
Dr. Takumi Hayashi	Hydrogen Isotope Permeation from Cooling Water through Various Metal Piping	052
Mr. Kalyan Bhanja	Hydrodynamics of Wire-mesh Corrugated Structured Packing for Tritium Extractor from Lead-Lithium (PbLi)	053
Dr. Masahiro Tanaka	Extraction of Hydrogen into Vacuum by Electrochemical Hydrogen Pump for Hydrogen Isotope Recovery	054
Mr. Muyi Ni	Design and Analysis on Tritium System of Fusion-Fission Hybrid Reactor for Fission Reactor Spent Fuel Burner (FDS-SFB)	055
Mr. Makoto Kobayashi	Release Behavior of Tritium Generated in Lithium-enriched $Li_2+xTiO_3$ by Thermal Neutron Irradiation	056
Dr. Massimo Zucchetti	A Model for Tritium Transport in Fusion Reactor Components: the FUS-TPC Code	057
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Mrs. Almudena Rueda	Towards ITER Quality Assurance of ECOSIMPRO® for Tritium Modelling and Design Analysis in ITER	059

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Session chair: Lee Cadwallader

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Ms. Paloma Castro	Conceptual Design and Detailed Engineering of a Double Loop Pb15.7Li/ Pressurized-He for Nuclear Fusion Technology	061
Mr. Pinghuai Wang	Technical Issues of the Reduced Activation Ferritic/ Martensitic Steel CLF-1 for the Manufacturing of CN HCSB TBM	062
Dr. Akira Kohyama	HHF Components and Blanket Components Fabrication by NITE-SiC/SiC Method Based Combined Processes	063
Dr. Yongjin Feng	Performance of Lithium Orthosilicate Pebbles using Melting-spraying Method	064
Dr. In Soo Son	Microstructure and Thermal Shock Property of Liquid Phase Sintered C <sub>f</sub> /SiC Composites	065
Dr. Keitaro Kondo	Neutronic Analysis for the IFMIF Target and Test Cell using a New CAD-based Geometry Model	066
Dr. Noriyuki Y. Iwata	Influence of Milling Atmospheres on the Microstructure and Tensile Properties of High-Cr MA/ODS Ferritic Steels	067
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Dr. Jarir Aktaa	Non-linear Failure Analysis of HCPB Test Blanket Module	069
Dr. Pietro A. Di Maio	On the Experimental Investigation of Non-linear Elastic Behaviour of a Polydisperse Lithium Orthosilicate Pebble Bed	070
Dr. Frederik Arbeiter	Results of the First Phase of Validation Activities for the IFMIF High Flux Test Module	071
Dr. Takashi Nozawa	Interfacial Shear Properties of HIP Joints of Reduced-activation Ferritic/Martensitic Steel	072
Ms. Poulami Chakraborty	Production of Lead-17 At % Lithium Eutectic Based on Permanent Magnet Stirrer Technique	073

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Mr. Bernd Missal	Main-Components of the Wendelstein 7-X Cryostat - Critical Manufacturing Aspects and Status of Assembly	074
Dr. Kwanwoo Nam	Alleviation of Hot Spot Temperature and Flow Mal-distribution for Actively Cooled ITER Thermal Shield	075
Dr. Kei Masaki	JT-60SA Vacuum Vessel Manufacturing and Assembly	076
Dr. Mike Kuznetsov	Structural Response of VV to Combustion Pressure Loads	077
Dr. Anisia Bornea	Upgrade of Plant Detritiation Processing Capacity for Low and High Activity Water Waste	078
Dr. BongGuen Hong	Conceptual Study of Fusion-driven Transmutation Reactor with ITER Physics and Engineering Constraints	079
Mr. Clement Fausser	Tokamak D-T Neutron Source Models for Different Plasma Physics Confinement Modes	080
Dr. Makoto Nakamura	Efforts Towards Improvement of Systems Codes for the BA DEMO Design	081
Dr. Tim D. Bohm	Detailed Nuclear Analysis of ITER ELM Coils	082
Mr. Mausam Sarkar	Optimization Study of Helically Coiled Liquid Metal Heat Exchanger (LMHX) for Lead Lithium Circulation System (LLCS) of Indian LLCB TBM	083
Ms. Qi Yang	Activation Analysis of the Cooling Water in ITER	084
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Mr. Manohar V. Gathibandhe	Neutronic Design of Indian LLCB TBM	086
Dr. Jinkyung Lee	Nondestructive Evaluation on Welding of Stainless Steel	087
Dr. Winston E. Han	Theoretical Modelling of Gas Flow and Filtering of Particulates in Cracks in Containment Barriers, and Comparison with other Theoretical and Empirical Studies	088

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Mr. J�r�my Sabard	Study of Nitrogen Dilution, Pressure and Temperature Effects on Spherical Flames Propagation of H <sub>2</sub> /O <sub>2</sub> /N <sub>2</sub> Mixtures	090
Mr. Vilas C. Chaudhari	Analysis of the Reference Accidental Sequence for Safety Assessment of LLCB TBM System	091
Dr. Andrey Denkevits	Scaling Experiments on Combined Hydrogen/ Tungsten Dust Explosion Hazard in ITER	092
Mr. Toshihiro Shibata	Assessment of Tritium Migration Path from Foods to DNA	093
Dr. Aurelia Magdalena Dianu	Tritium Analysis in Hydraulic Oil Waste by Oxidation Technique	094
Mr. Junpei Nagane	Performance of Commercial Catalyst for Oxidation of Tritium	095
Dr. Vladimir Chakin	Creep of Beryllium Pebbles after Neutron Irradiation at High Temperatures up to 3000 appm Helium Accumulation	096
Dr. Ulrich Neuner	Preparing Diagnostics for Long Pulse Operation at W7-X	097
Dr. Paolo Frosi	Preliminary Electromagnetic, Thermal and Structural Finite Element Analysis of FAST Load Assembly	098
Dr. Peter P. Bourauel	Neutronic Analysis of CXRS Port Plug Diagnostic Structures of ITER with Newly Developed Software Tools	099
Dr. Milan Zmitko	Status and Development Strategy for the EU Test Blanket Modules Experimental Test Program and Simulation Capacity	100
Dr. Ming-Jiu Ni	A Fully Conservative Scheme on a Staggered Mesh for MHD at Low Magnetic Reynolds Number	101
Dr. Pietro A. Di Maio	Study of the Thermo-mechanical Performances of the IFMIF-EVEDA Lithium Test Loop Target Assembly	102

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Dr. Jizhong Sun	Modeling of Erosion and Deposition on Rough Test Limiter Exposed to the Edge Plasma of TEXTOR and Resulting Surface Evolution	104
Mr. Xiong Yi-Fu	Study on the Resistance of Polyimide Towards $\beta$ -Irradiation	105
Dr. Hiroyasu Utoh	Conceptual Study of Vertical Sector Transport Maintenance for DEMO Fusion Reactor	106
Mr. Xuebing Peng	Remote Handling System for EAST Superconducting Tokamak Maintenance	107
Mr. Bruno Levesy	Design Progress on ITER Port Plug Test Facility	108

## Thursday, September 15, 2011

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Keynote Session 3, Grand Ballroom

Session chairs: Masato Akiba, Mike Dunne

8:30 – 9:15 Overview of the US ITER Project

Dr. Ned Sauthoff

9:15 – 9:50 Overview and Status of the JT60SA Project

Dr. Yutaka Kamada

Break

Plenary Session 4, Grand Ballroom

Session chairs: Anton Moeslang, Italo Ricipito

10:15 – 10:50 Overview of the Design and R&D of the ITER  
Blanket System

Dr. Rene Raffray

10:50 – 11:25 Overview of the Laser Inertial Fusion Energy  
(LIFE) Design

Dr. Mike Dunne

11:25 – 12:00 ITER Safety and Licensing Update

Dr. Neill Taylor

Lunch

Oral Session 10, Reactor Design, Grand Ballroom West

Session chairs: Wayne Meier, Akira Kohyama

1:30 – 2:00 Fusion Nuclear Technology R&D in Support of LIFE

Dr. Jeff Latkowski

2:00 – 2:30 Helical Demo Reactor Design FFHR-d1

Dr. Akio Sagara

2:30 – 3:00 An Exploratory Study on the Technological Gaps  
and Pathways to the Korean DEMO

Dr. Hyuck Jong Kim

3:00 – 3:30 Activities on the Laser Fusion Reactor KOYO-F  
in Japan

Dr. Takayoshi Norimatsu

Oral Session 11, Plasma Facing Component Development, Timberline Room

Session chairs: Richard Nygren, Alice Ying

1:30 – 2:00 Development of the Plasma Facility Components  
in Japan for ITER

Dr. Satoshi Suzuki

2:00 – 2:30 Engineering Trade-offs for Plasma Facing  
Components

Dr. Richard Nygren

2:30 – 3:00 Nuclear Engineering of Plasma Diagnostics on ITER

Dr. Spencer Pitcher

3:00 – 3:30 Full-scale Divertor RH Test Facility: Main  
Achievements and RD Program

Dr. Mikko Siuko

Thursday, September 15, 2011

Oral Session 12, Fusion Nuclear Materials, Grand Ballroom East  
Session Chairs: Neil Morley, Eberhard Diegele

1:30 – 2:00	The Challenges of Moving Beyond the ITER Candidate Plasma Facing Materials	Dr. Lance Snead
2:00 – 2:30	Material Challenges for Future Fusion Nuclear Devices	Dr. Richard Kurtz
2:30 – 3:00	Overview of the Material Engineering in the Fusion Nuclear Technology	Dr. Hiroyasu Tanigawa
3:00 – 3:30	Development of the Advance Tritium Breeder and Neutron Multiplier for DEMO	Dr. Tsuyoshi Hoshino

Note: the afternoon break will be served from 3:30 to 4:00 pm during the poster session.

Thursday, September 15, 2011  
 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Dr. Yuri Igitknanov	Plasma Facing Materials Lifetime in DEMO Reactor	001
Dr. Hongbin Ding	Laser Cleaning of the Co-deposition on the First Mirror of HL-2A	002
Mr. Jens Reiser	Optimization and Limitations of Known DEMO Divertor Concepts	003
Dr. Xiang Ji	R&D on Passive Stabilization Loop at EAST	004
Dr. Xiang Ji	R&D and Maintenance on Graphite Tile of EAST Divertor	005
Mr. Song Jiangfeng	Fabrication of Copper Armoured Plasma Facing Components using Hot Isostatic Pressing	006
Mr. Song Jiangfeng	Study on the Resistance of Polyimide towards b-irradiation	007
Mr. Vladimir Kuznetsov	Status of the High-Heat-Flux Test Facility TSEFEY-M	008
Mr. Amir E. Jaber	Rhenium and Molybdenum Coatings for Dendritic Tungsten Armors of Plasma Facing Components: Concept, Problems, and Solutions	009
Dr. Yuji Nobuta	Tritium Absorption of Co-deposited Carbon Films	010
Dr. Koichiro Ezato	R&D Activities on Manufacturing Plasma-facing Unit for Prototype of ITER Divertor Outer Target in JADA	011
Dr. Gregory De Temmerman	Performance of Diamond as a Plasma-facing Material under Extreme Heat Loads	012
Dr. Dennis L. Youchison	Design and Fabrication of a High-temperature Helium Regenerator	013
Dr. Tomoaki Hino	Fuel Hydrogen Retention of Tungsten and the Reduction by Inert Glow Discharges	014
Ms. Jing Wu	Retention Behaviour of EAST Irradiated Graphite Tiles with Exposure to Tritium Gas	015
Dr. Pan Qi	The Quality Control of EAST Coating Tungsten Components Using Ultrasonic Technique	016

Thursday, September 15, 2011  
 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Dr. Yoshinori Kawamura	Effect of Sweep Gas Species on Tritium Release Behavior from Lithium Titanate Packed Bed during 14 MeV Neutron Irradiation	017
Dr. Wolfgang Krauss	TBM testing in ITER: Requirements for the Development of Predictive Tools to Describe Corrosion-related Phenomena in HCLL Blankets towards DEMO	018
Mr. Hideki Yamasaki	Effect of Water Vapor on Tritium Permeation Behavior in the Blanket System	019
Ms. SooBeen Yum	Thermal Hydraulic Test with High Heat Flux Test Facility using the First Wall Mock-up for the Korean He Cooled Test Blanket	020
Mr. Sander van Til	Summary of the Post Irradiation Examination of the Pebble Bed Assemblies Irradiation Experiment	021
Dr. Andrea Ciampichetti	Design of Tritium Extraction System for the European HCPB Test Blanket Module	022
Dr. Igor B. Kupriyanov	Production and Investigation of the Beryllium Pebbles with Fine Grain Structure for HCPB Breeder Blanket	023
Dr. Jae Sung Yoon	Fabrication and Thermal-Hydraulic Test of the 1/6-scale Mock-up for the HCML TBM FW	024
Mr. Vladimir Rozov	Calculation and Superimposition of Electromagnetic Loads on the ITER Blanket: Analysis Strategy and Initial Results	025
Dr. Satoshi Sato	Effects of Lithium Burn-up on TBR in DEMO Reactor	026
Mr. Tao Zhou	Numerical Analysis of MHD Flow of DFLL-TBM on the Single Coolant Stage	027
Dr. Yoshinobu Yamamoto	MHD Heat Transfer Assessment under Blanket Design Condition utilized Molten Salt Coolant by Means of New Improved RANS Simulation	028
Dr. Weihua Wang	Three-dimensional Dual-flow Fields Analysis of the DFLL TBM for ITER	029
Dr. Pierluigi Chiovaro	A Neutron Point Kinetic Model for Fusion Relevant Calculations	030

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Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30

Session chair: Paul Humrickhouse

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Dr. Marco Utili	Investigation of Hydrogen Isotopes in PbLi and Permeation Technology by a Multipurpose Laboratory Scale Apparatus	032
Mr. Yoshitaka Ueki	3D Numerical Analysis of MHD Flow in an Electrical Conducting Duct with Disturbances by Flow Diagnostics	033
Ms. Ana Isabel Barrado	Towards QA 6LLE Production as Nuclear Material for ITER TBM	034
Mr. Gorka Alberro	Towards Standardisation of Tritium Diffusion and Solubility Measurements in Fusion Reactor Materials	035
Mrs. Elisabet Mas de les Valls	Influence of Thermal Performance on Design Parameters of a He/LiPb Dual Coolant DEMO Conceptual Blanket Design	036
Mr. Xiao cheng Jian	Improvement of Isotope Exchange Reaction over Lithium Orthosilicate Pebbles by Deposition of Catalytic Active Metals	037
Dr. Xi-zhang Chen	Microstructure and Mechanical Property of CLAM Steel Weld HAZ	038
Dr. Xiaojun Chen	Comparison Study on Tritium Release Properties of Li <sub>4</sub> SiO <sub>4</sub> Ceramic Pebble using Different System	039
Mr. George Ana	Pressure and Temperature Transients of a Cryogenic Distillation System during Abnormal Operation or Accidents	040
Ms. Qian Xiao. Jing	Study on the Hydrogen Absorption Capability of Molecular Sieves	041
Prof. Dezhen Wang	Investigations of the Effect of Carbon Source on Fuel Retention in Gaps Between Divertor Tiles using a Kinetic Code System	042
Mr. Fumito Okino	Vacuum Sieve Tray for Tritium Extraction from Liquid Pb-17Li	043
Ms. Alessia Santucci	Inactive Commissioning of a Micro Channel Catalytic Reactor for Highly Tritiated Water Production in the CAPER Facility of TLK	044

Thursday, September 15, 2011  
 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Dr. Ana Parracho	Process of Highly Tritiated Water Desorbed from Molecular Sieve Bed using PERMCAT	045
Dr. Tianyong Luo	Laminated Object Manufacturing Technology Applied for Fabrication of U-shaped Cooling Channels	046
Mr. Robert Pearce	Gas Species, Sources, Evolution and Segregation through ITER Vacuum Systems	047
Mr. Robert Michling	Commissioning of an Enhanced and Combined Water Detritiation and Isotope Separation Test Facility in View of ITER Design Requirements at Tritium Laboratory Karlsruhe	048
Mr. Yuichi Abe	Prototype Manufacturing of Large Tritium Target for DT Neutron Source inside JAEA	049
Ms. Paloma Castro	Tritiated Cloud Patterns Environmental Impact in Air into the Western Mediterranean Basin Evaluation in Comparison with an OPV and Nowcasting Consequences	050
Mr. Pablo Miguel Martínez Alcalde	Optimizing Tritium Extraction from a Permeator Against Vacuum (PAV) by Dimensional Design Using Different Tritium Transport Modeling Tools	051
Mr. Shotaro Moriyama	Influence of Isotopic Composition on Breakthrough Curves of Hydrogen Isotopes Mixture with Adsorption Column Packed with SZ-13X at 77.4 K	052
Mrs. Almudena Rueda	Development of Predictive Tools for Dynamic Tritium Transport and Transfer Analyses with ECOSIMPRO®	053
Dr. Carlos Moreno	PFD Developments for Tritium Dynamic Transfers and Inventories Assessments for the EU HCLL ITER Test Blanket Module	054
Mr. Sergej Gordeev	Detailed Numerical Analysis of High-speed Liquid Lithium Free-surface Flow	055
Mr. Cheng Yu Lei	Experimental Study on Pores in TIG Welding of Oxide Dispersion Strengthened (ODS) MGH956 Alloys	056
Dr. Pengyuan Li	Development of Fabrication Technologies for ITER Magnet Supports	057

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 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

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Dr. Sangpill Lee	Thermal Shock Properties of 2D-SiC <sub>f</sub> /SiC Composites	058
Dr. Toshiya Nakata	Evaluation of Local Deformation Behavior Accompanying Fatigue Damage of a Reduced Activation Ferritic/Martensitic Steel Welded Joint Test Specimen Using Digital Image Correlation Method	059
Dr. Xin Ju	Effect of Helium and Hydrogen Irradiation at Different Temperatures on Microstructure and Hardness of Reduced Activation Ferritic/Martensitic Steel	060
Dr. Takehiko Yokomine	On-beam Analysis of Free Surface Target	061
Mr. Hiroki Takahashi	Evaluation of Gamma-ray and Neutron Energy for Area Monitoring System in the IFMIF/EVEDA Accelerator Building	062
Mr. Bryan Heim	The Materials Analysis Particle Probe (MAPP) Diagnostic: Correlating Plasma Performance to the Plasma-Material Interface at the Tokamak Edge	063
Dr. Hirotatsu Kishimoto	Processing and Microstructure of F82H HIPed Joints for First Wall Fabrication in Fusion Blanket	064
Dr. Takuy Yamamoto	Synergistic Effects of Helium and Displacement Damage in Ferritic Steels for the First Wall Structure; Task 2-2: Irradiation Integrity in TITAN project (2)	065
Ms. Paloma Castro	Progress on Development of a H-Concentration Probes in Eutectic Lead-Lithium: Synthesis and Characterization of Electrochemical Sensor Materials	066
Dr. Dong-Su Bae	Effect of He-Injection on Irradiation-Induced Segregation of Aging Treated 12%Cr-15%Mn Austenitic Steel	067
Mr. Gonzalo Micó Montava	Project Management Techniques used in the European Vacuum Vessel Sectors Procurement for ITER	068

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 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Mr. Gonzalo Micó Montava	Manufacturing Preparations for the European Vacuum Vessel Sectors for ITER	069
Dr. Byoung Yoon Kim	Lubricant Coating of Dowel for the ITER Vacuum Vessel Support	070
Mr. Marius Zamfirache	Research Program of ICIT on Tritium Field as Support for Fusion Program	071
Mr. Songke Wang	Electromagnetic Behavior on the ITER Soft X-ray Camera	072
Dr. Yongwei Yang	Feasibility Study on the Commensal System of PWR and FFHR	073
Dr. Fabio Moro	Neutronic Analysis of the ITER Equatorial Port Plug 1	074
Mr. Jean-Jacques Cordier	Progress in Design Integration of the ITER Tokamak basic machine and Plant Systems Layout	075
Dr. Teruya Tanaka	Design Studies on Three Dimensional Issues for Liquid Blanket System in Helical Reactor	076
Dr. Chikara Konno	Validation of Multigroup Library MATXSLIB-J40 based on JENDL-4.0	077
Dr. Tim D. Bohm	Detailed Nuclear Analysis of ITER Blanket Modules	078
Dr. Dmitry Klimenko	Safety of Fusion Magnets: Conductor to Feeder Tube Arcing Model Experiments to High Current Arcs Propagating Along the Busbars of Large Fusion Magnet Coils	079
Ms. Jing ru Han	Radiation shielding safety analysis for China Helium Cooled Solid Breeder Test Blanket Module	080
Dr. Sunao Maebara	Activation Analyses by Deuteron Beam Loss at 5-9 MeV for the IFMIF/EVEDA Accelerator	081
Dr. Hirofumi Nakamura	Deuterium Behaviour at the Interface of Oxidized Metal under High Temperature Heavy Water	082
Dr. Yuan Run	Failure Modes and Effects Analysis on ITER DFLL-TBM System	083
Dr. Kenji Tobita	Waste Management Strategy focused on Maintenance, Storage and Recycling	084

Thursday, September 15, 2011  
 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Mr. Daniel López	Radioactive Waste Management for the IFMIF/EVEDA Facility	085
Dr. Massimo Zucchetti	Heat Load and Disruption Analyses for Advanced-fuel Nuclear Fusion Reactors	086
Dr. Xavier Lefebvre	Preliminary Results from a Detritiation Facility Dedicated to Soft Housekeeping Waste	087
Ms. Mai Fukuda	Experiments on Absorption of Water Vapor on Commercial Adsorbents	088
Ms. Catalina Nazare	Stray RF Power Modelling in the ITER Tokamak During EC Operation	089
Mr. Michel Chantant	Computation of Tore Supra Cooling System Limits	090
Dr. Maurizio Angelone	Neutronics Analysis and Nuclear Heating Measurement up to the TFC in a Mock-up of the ITER Inboard Shield	091
Dr. Ming-Jiu Ni	Development of MHD Solver based on an Adaptive Mesh Refinement Technique	092
Mr. Hongjie Zhang	Modeling Tritium Transport in PbLi Breeder Blankets	093
Mr. Guozhong Wang	Application of Monte Carlo Automatic Modeling Program to ITER Building Neutronics Modeling	094
Mr. Seiki Ohnishi	New Integral Experiments for Larger Angle Scattering Cross Section Data Benchmarking with DT Neutron Beam at JAEA/FNS	095
Dr. Axel Klix	Neutronics Diagnostics for European ITER TBMs: Activation Foil Spectrometer for Short Measurement Cycles	096
Dr. Mingzhun Lei	Mechanical Analysis of the PF1 Feeder for ITER	097
Dr. Sin-iti Kitazawa	RAMI Analysis of ITER CODAC	098
Dr. Kyoungso Nam	Development of ITER Sector Assembly Tools and Mock-up	099
Mr. Soichiro Shigematsu	Verification Test Results of a Cutting Technique for the ITER Blanket Cooling Pipes	100
Dr. Hisashi Tanigawa	Comparative Study of Laser and TIG Weldings for Application to ITER Blanket Hydraulic Connection	101

Thursday, September 15, 2011  
 Poster Session 3, Mt. St. Helens Ballroom, 3:30 – 5:30  
 Session chair: Paul Humrickhouse

<u>Author</u>	<u>Paper Title</u>	<u>Poster number</u>
Dr.-Ing. Martin Mittwollen	IFMIF – Layout and Arrangement of Cells According to Requirements of Technical Logistics, Reliability and Remote Handling	102
Dr. Xinxin Lu	Simulation and Analysis of Experimental Plutonium Production Rates in Depleted Uranium Sphere Bombarded by 14 MeV Neutron	103
Mr. Rong Liu	Techniques of Neutronics Integral Experiments for Blanket of Hybrid Reactor	104
Dr. Maosheng Li	Preliminary Design of Hybrid Energy Reactor and Integral Neutron Experiments	105
Dr. Isao Murata	Neutronics Benchmark Performance Analysis with Partial Adjoint Contribution in Forward Monte Carlo Calculations	106

6:30 pm Buses will begin boarding at the Banquet Entrance of the Hotel to convey attendees to the Portland Art Museum for the Symposium Working Dinner.

## **Friday, September 16, 2011**

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Plenary Session 5, Grand Ballroom

Session Chairs: Valery Chuyanov, Neill Taylor

8:30 – 9:05 Progress of ITER Vacuum Vessel towards Construction

Dr. Kimihiro Ioki

9:05 – 9:40 Fusion Tritium Research Project in Japan

Dr. Tetsuo Tanabe

Break

Plenary Session 6, Grand Ballroom

Session Chairs: Takeo Nishitani, Hirooyasu Tanigawa

10:15 – 10:50 Process and Analytical Issues for Tritium Management in the Breeder Blanket of ITER and DEMO

Dr. David Demange

10:50 – 11:25 The European Integrated Materials and Technology Program

Dr. Anton Moeslang

11:25 – 12:00 Closing Session

Dr. Mohamed Abdou  
Dr. Hideyuki Takatsu  
Mr. Brad Merrill

## **Satellite Meetings held during ISFNT-10**

Tritium Technology Subtask 4 of IEA IA on Nuclear Technology of Fusion Reactors,  
Tuesday, September 13, 2011, 3:30 – 4:30 pm, White Stag Room  
Contact person: Dr. T. Yamanishi

International Workshop on Sub-Task on Fusion Neutronics,  
Tuesday, September 13, 2011, 2:00 – 5:00 pm, Overton Room  
Contact person: Dr. P. Batistoni

IEA ESE/FP Executive Committee Meeting,  
Tuesday, September 13, 2011, 7:00 – 9:00 pm, Overton Room  
Contact person: Mr. B. Merrill

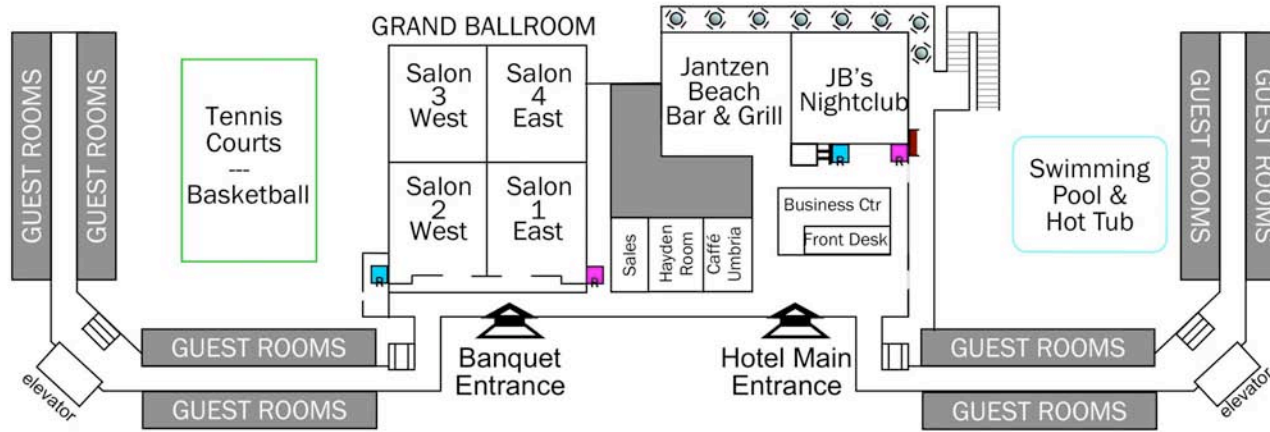
Tritium and Blanket Technologies of DEMO R&D under the Broader Approach Program,  
Wednesday, September 14, 2011, 2:00 – 5:00 pm, Pettygrove Room  
Contact person: Dr. T. Yamanishi

IEA Nuclear Technology for Fusion Reactors Subtask 1 PFC Meeting,  
Wednesday, September 14, 2011, 3:00 – 5:30 pm, White Stag Room  
Contact person: Dr. D. Youchison

IEA Nuclear Technology for Fusion Reactors Executive Committee Meeting,  
Thursday, September 15, 2011, 1:30 – 6:00 pm, Overton Room  
Contact person: Dr. R. Lässer

<b>Time</b>	<b>Sunday September 11</b>	<b>Monday September 12</b>	<b>Tuesday September 13</b>	<b>Wednesday September 14</b>	<b>Thursday September 15</b>	<b>Friday September 16</b>	
0730-0800		Continental Breakfast	Continental Breakfast	Board Buses	Continental Breakfast	Continental Breakfast	
0800-0830				Board the Portland Spirit			
0830-0900		Keynote Session 1	Plenary Session 1	Cruise on the Portland Spirit & Continental Breakfast	Keynote Session 3	Plenary Session 5	
0900-0930		Grand Ballroom	Grand Ballroom		Grand Ballroom	Grand Ballroom	
0930-1000							
1000-1030		1000-1030 Break	0940-1015 Break		0950-1015 Break	0940-1015 Break	
1030-1100		Keynote Session 2	Plenary Session 2		Plenary Session 4	Plenary Session 6	
1100-1130		Grand Ballroom	Grand Ballroom	Dock at Red Lion	Grand Ballroom	Grand Ballroom	
1130-1200							
1200-1230	Registration opens in Red Lion hotel lobby. Registration continues during the opening session on Sunday evening.	Lunch	Lunch	Lunch	Lunch	Closing Ceremony	
1230-1300							
1300-1330							
1330-1400			Oral Sessions: ITER Technology, Neutronics, Blanket Development	Oral Sessions: Fueling Cycle Systems, ITER TBM, Blanket Design	Plenary Session 3	Oral Sessions: Reactor Design, PFC Development, Fusion Nuclear Materials	
1400-1430					Grand ballroom		
1430-1500							
1500-1530							
1530-1600			Break	Poster Session 1	Poster Session 2	Poster Session 3	
1600-1630			Oral sessions: In-vessel Components, Fusion Code Development, Safety	Mt St Helens Room	Mt St Helens Room	Mt St Helens Room	
1630-1700				1530-1600 Break	1515-1545 Break	1530-1600 Break	
1700-1730							
1730-1800							
1800-1830							
1830-1900					Board Buses		
1900-1930	Symposium Welcome Session in Mt. St. Helens Room			ISC Working Dinner	Symposium Working Dinner		
1930-2000							
2000-2030							
2030-2100							
2100-2130							
2130-2200					Board Buses		

## Lobby Level—2nd Floor



## Lower Level—1st Floor

