

# **International Conference on Plasma Surface Interactions in Controlled Fusion Devices**

**Princeton University, NJ, USA, 17–22 June 2018**



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**PSI-23 Program Epitome**

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**Rajesh Maingi**  
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**Ege Kolemen**  
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**Mike Jaworski**  
Chair Editorial Bd.

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Chair Program Ctte.



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The PSI-23 Local Organizing Committee would like to welcome you to the 23rd International Conference on Plasma Surface Interactions in the historic town of Princeton. The PSI-23 Program Committee has organized an outstanding program of talks and poster presentations.

We hope you have a productive and pleasant stay in Princeton and find the information you need on the conference website. Please contact us at the registration desk in Alexander Hall for any query. We will be happy to help.

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## Please note:

All oral sessions are in *Richardson Auditorium*

### Speaker color code:

**Review: red text**

**Invited: blue text**

**Contributed Oral: green text**

All posters sessions are in *Chancellor Green*

Coffee breaks are in *Alexander Beach Tent*

Lunch is served in *Rockefeller and Mathey Colleges*

The Nassau Church Assembly Room  
will be open 10:30–6:30 daily.

Any changes after 15 May 2018 will be posted at  
[psi2018.princeton.edu](http://psi2018.princeton.edu).

## Sunday June 17th

Tutorial Session

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
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<b>1:00</b>	<b>deTemmerman</b> — Physics of Linear Devices	
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<b>2:00</b>	<b>Koel</b> — Chemistry at the edge: Surface science probes of plasma-materials interactions	
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<b>3:00</b>	<i>coffee break</i>	
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<b>3:30</b>	<b>Feng</b> — 3D Stellarator Edge Physics	
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<b>4:30</b>	<b>Goldston</b> — SOL physics + heat dissipation	
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## Monday June 18th

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
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<b>8:30</b>	<b>Opening</b>	
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<b>8:40</b>	<b>Introductory Lecture</b> <b>Socolow</b> — In a low-carbon future, where does fusion fit in?	
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<b>9:10</b>	<b>Krasheninnikov</b> — Divertor plasma detachment: past and future	456
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9:50	<b>Kallenbach</b> — Role of the divertor neutral pressure on power exhaust and operational limits in ASDEX Upgrade	48
10:20	<b>Wang, H</b> — Effects of divertor geometry on H-mode pedestal structure near divertor detachment in the DIII-D tokamak	93
10:40	<i>coffee break</i>	
11:10	<b>de Temmerman</b> — Will tungsten fuzz form in ITER?	220
11:30	<b>Widdowson</b> — Deposition of impurity metals in JET ITER-like Wall campaigns	205
12:00	<b>Makepeace</b> — The effect of Beryllium Oxide on retention in JET ITER-like wall tiles	392
12:20	<b>Ashikawa</b> — Determination of retained tritium from ILW dust particles in JET	360
12:40	<i>lunch</i>	
2:10	<b>Wang, L</b> — Particle and Power Exhaust for H-mode Operation over 100 Seconds with ITER-like Tungsten Divertor in EAST	94
2:40	<b>Tamain</b> — Impact of self-consistent neutrals dynamics and particle sources on edge plasma transport and turbulence in 3D first principle simulations	82
3:10	<b>Brida</b> — Power Exhaust and Detachment in Divertor Tokamaks with 3D Magnetic Perturbations in ASDEX Upgrade	432
3:30	<b>Effenberg</b> — Exploration of Radiative Edge Cooling in the Island Divertor at Wendelstein 7-X	442
3:50	<b>Zhong</b> — Heat load and ELM control with impurity mixture SMBI seeding for ELMy H-mode plasmas in the HL-2A tokamak	493
4:10	<i>coffee break</i>	
4:30	Poster session 1 in Chancellor Green	
6:30	Reception & Art Museum	

# Tuesday June 19th

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
8:30	<b>Reiter</b> — Atomic and molecular processes in plasma surface interactions and boundary plasma science	72
9:10	<b>Ohno</b> — Influence of recombination front region on plasma detachment in a linear divertor plasma simulator	66
9:40	<b>Lomanowski</b> — Spectroscopic investigation of N <sub>2</sub> and Ne seeded induced detachment in JET ITER-like wall	460
10:10	<b>Jaervinen</b> — Impact of Drifts on Divertor Power Exhaust in DIII-D	451
10:40	<i>coffee break</i>	
11:10	<b>Majeski</b> — The effect of lithium conditioning approaches for plasma-facing surfaces on the edge and core temperature and density profiles	59
11:40	<b>Hu</b> — Experiments of continuously and stably flowing lithium limiter in EAST towards a solution for the power exhaust of future fusion devices	324
12:00	<b>Iafrati</b> — Review of the experiments performed with liquid lithium and tin limiters on FTU	336
12:20	<b>Drenik</b> — Ammonia formation in N <sub>2</sub> -seeded H-mode discharges on JET and ASDEX-Upgrade	320
12:50	<b>Group photo at Blair Arch</b>	
1:00	<i>lunch</i>	
2:20	<b>Drewelow</b> — Initial Results of the First Wendelstein 7-X Island Divertor Experiments	440
2:50	<b>Drews</b> — Edge plasma measurements on the Op. 1.2 divertor plasmas at W7-X using the upgraded combined probe	26
3:10	<b>Masuzaki</b> — Effects of drift on the divertor plasma transport in LHD	62

<b>3:30</b>	<b>Cavedon</b> — Ion Heat and Particle Transport in the ASDEX Upgrade H-Mode Pedestal from Ultra-fast CXRS measurements	15
<b>4:00</b>	<b>Samuelli</b> — Experimental Verification of Three- Dimensional Impurity Flows Due to Temperature-Driven Pressure Gradients	74
<b>4:20</b>	<i>coffee break</i>	
<b>4:30</b>	Poster session 2 in Chancellor Green	
<b>6:30</b>	Concert, Robert Taub, Pianist	

## Wednesday June 20th

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
<b>8:10</b>	<b>Reimerdes</b> — Alternative diver-tor configurations for energy and particle exhaust	341
<b>8:50</b>	<b>Luo</b> — High-confinement steady-state operation with quasi-snow-flake divertor configuration and active radiation feedback control in EAST	462
<b>9:20</b>	<b>In</b> — Impact of 3-D magnetic field topology on divertor heat flux under ITER-like RMP config.	45
<b>9:50</b>	<b>Hinson</b> — Enhancement of helium exhaust during RMPELM suppression at DIII-D and analysis with 3-D edge fluid and kinetic neutral code EMC3-EIRENE	129
<b>10:10</b>	<i>coffee break</i>	
<b>10:30</b>	<b>Bauer</b> — Hydrogen Isotope Exchange in Tungsten at Low Temperatures	365
<b>11:00</b>	<b>Simmonds</b> — Isolating the Detrapping of Deuterium in Heavy Ion Damaged Tungsten via Partial Thermal Desorption	405
<b>11:20</b>	<b>Bernard</b> — Tritium retention in W plasma-facing materials: impact of the material structure and of He and He-D irradiation	367

11:50	<b>Bykov</b> — Impact of divertor target material on recycling and discharge fueling during the full ELM cycle	370
12:10	<b>Mueller</b> — Additive Manufacturing of Tungsten for Plasma-Facing Component Application	351
12:30	<i>pick up box lunches</i>	
12:40	begin boarding buses for excursions	

## Thursday June 21st

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
8:30	<b>Tskhakaya</b> — The kinetic SOL: Understanding the sheath physics in tokamaks - progress in PIC modelling	89
9:10	<b>Abrams</b> — The DIII-D Metal Rings Campaign: Characterizing tungsten sources, SOL transport, and its impact on high-performance scenarios	120
9:40	<b>Kirschner</b> — Modelling of tungsten erosion and deposition in the divertor of JET-ILW in comparison to experimental findings	172
10:00	<b>Morgan</b> — High re-deposition ratio of high-Z metals under plasma exposure in Magnum-PSI	137
10:20	<i>coffee break</i>	
10:50	<b>Romazanov</b> — Modelling of Beryllium migration in JET-ILW with ERO2.0	115
11:20	<b>Moon</b> — First Mirror Test in JET for ITER: complete overview after three ILW campaigns	292
11:40	<b>Yan</b> — Overview of first mirror cleaning using radio frequency plasma in EAST	304
12:00	<b>Bortolon</b> — Real-time wall conditioning by controlled injection of boron and boron nitride powder in full tungsten wall ASDEX-Upgrade	496



<b>12:20</b>	<b>Guterl</b> — ERO modeling of tungsten erosion and migration from a toroidally symmetric source in DIII-D divertor	162
<b>12:40</b>	<i>lunch</i>	
<b>2:10</b>	<b>Happel</b> — The I-mode confinement regime on the ASDEX Upgrade tokamak: scrape-off layer properties and investigation of stationary and transient divertor heat loads	37
<b>2:40</b>	<b>Hubbard</b> — Extension of the I-mode confinement regime to 8 tesla on Alcator C-Mod	43
<b>3:00</b>	<b>Spilker</b> — Performance Estimation of Beryllium under ITER Relevant Transient Thermal Loads	118
<b>3:30</b>	<b>Makhlai</b> — Influence of surface tension on macroscopic erosion of castellated tungsten surfaces during repetitive transient plasma loads	176
<b>3:50</b>	<b>Li</b> — Thermal and mechanical properties characterization of the surface damaged layer of tungsten	333
<b>4:10</b>	<i>coffee break</i>	
<b>4:30</b>	Poster session 3 in Chancellor Green	
<b>6:00</b>	1st buses depart for banquet	
<b>6:30</b>	2nd buses depart for banquet	

## Friday June 22nd

<i>time</i>	<i>speaker - talk</i>	<i>Abst. #</i>
<b>8:30</b>	<b>Pitts</b> — Physics basis for the ITER tungsten divertor	475
<b>9:10</b>	<b>Dejarnac</b> — Physics of toroidal gap loading on castellated plasma-facing components	221
<b>9:40</b>	<b>Krieger</b> — Transient-induced tungsten melt motion studies on ASDEX Upgrade	

<b>10:00</b>	<b>Thoren</b> — MEMOS 3D modelling of ELM-induced transient melt damage on an inclined tungsten surface in the ASDEX Upgrade outer divertor	263
<b>10:20</b>	<i>coffee break</i>	
<b>10:40</b>	Poster session 4 in Chancellor Green	
<b>12:40</b>	<i>lunch</i>	
<b>2:10</b>	<b>Brunner</b> — Extending the boundary heat flux width database to 1.3 Tesla poloidal magnetic field in the Alcator C-Mod tokamak	433
<b>2:40</b>	<b>Fedorczak</b> — Width of scrape-off-layers in circular and diverted plasmas: a turbulent model confronted to experimental evidences	28
<b>3:00</b>	<b>Xu</b> — Modeling tokamak boundary plasma turbulence and understanding its role in setting divertor heat flux widths	98
<b>3:20</b>	<i>coffee break</i>	
<b>3:40</b>	<b>Bobkov</b> — Impact of ICRF on the scrape-off layer and on plasma wall interactions: from present experiments to DEMO	106
<b>4:10</b>	<b>LaBombard</b> — The effect of feedback-controlled divertor nitrogen seeding on the boundary plasma and power exhaust channel width in Alcator C-Mod	457
<b>4:30</b>	<b>Lipschultz</b> — Scrape-off layer density shoulder formation mechanisms in JET ITER-like wall L-mode and H-mode plasmas	114
<b>5:00</b>	<i>Close</i>	

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## Draft Bus Timetable

Please check PSI-23 website for latest information.  
Drop off will be on Nassau Street. Pick up will be on Elm Drive on campus.

### Sunday June 17 (tutorials):

- 11:00 a.m.** Buses depart Marriott and Westin for Nassau St.
- 5:45 p.m.** Buses depart Elm Drive for Marriott and Westin

### Monday June 18:

- 7:15 a.m.** Buses depart Marriott and Westin for Nassau St.
- 9:00 p.m.** Buses depart Elm Drive for hotels (after reception)

### Tuesday June 19:

- 8:00 a.m.** Buses depart Marriott and Westin
- 6:30 p.m.** Buses depart Elm Drive for hotels (for non-concert-goers)
- 8:30 p.m.** Buses depart Elm Drive for hotels (for participants attending concert)

### Wednesday June 20:

- 8:00 a.m.** Buses depart Marriott and Westin
- 1:15 p.m.** Buses depart Elm Drive for excursions.  
*For return transportation to hotels, see excursion webpage.*

### Thursday June 21:

- 8:00 a.m.** Buses depart Marriott and Westin
- 6:00 p.m.** First buses depart Elm Drive for Westin banquet
- 6:30 p.m.** Second buses depart Elm Drive for Westin banquet
- 9:30 p.m.** Buses return from Westin to Marriott and Nassau Inn

### Friday June 22:

- 8:00 a.m.** Buses depart Marriott and Westin
- 5:45 p.m.** Buses depart Elm Drive for hotels

# Conference facilities

