*In parallel with the increase of the plasma energy content and the particle fluence in present and, mainly, in future fusion devices, like ITER and DEMO, the study of plasma wall interaction is assuming greater and greater importance. The solutioan of the power exhaust problem, the limitation of tritium retention in the first wall materials, the mitigation of disruptions are among the most challenging topics.*

*The Plasma Surface Interactions in Controlled Fusion Devices conference represents, since 1974, the most important international rendezvous of plasma wall interaction experts.*

*The 22nd edition of this conference, organized by ENEA in the city of Rome, happens in a period of stimulating activities in the field of plasma wall interaction, with the recent JET ILW results, the study of new divertor configurations as well as of new wall materials, like liquid metals, the search of the best recipe for the power exhaust by seeded impurity radiation and so on.*

*The extent and the relevance of the debated subjects as well as the foreseen large participation in this edition are the guarantee of a fruitful and exciting conference.*


Welcome Cocktail - Sunday May 29, from 3:00 pm to 20.00 pm, a Welcome Cocktail at the Urbaniana University, during the registration to the conference, will allow you to enjoy the warm atmosphere of a roman sunset.


Monday May 30, from 08.00 pm to 11.00 pm, a Welcome Reception at "Castel Sant'Angelo" will bring you to one of the most enchanting and legendary location in Rome. It was commissioned by the Roman Emperor Hadrian as a mausoleum for himself and his family. The building was later used by the popes as a fortress and castle.


Wednesday June 1st an excursion to Roman Forums and Coliseum, is scheduled from 2.30 pm to 7.00 pm. The excursion is free for all conference participants. Meeting point at Via di Foro Traiano 1, Rome.

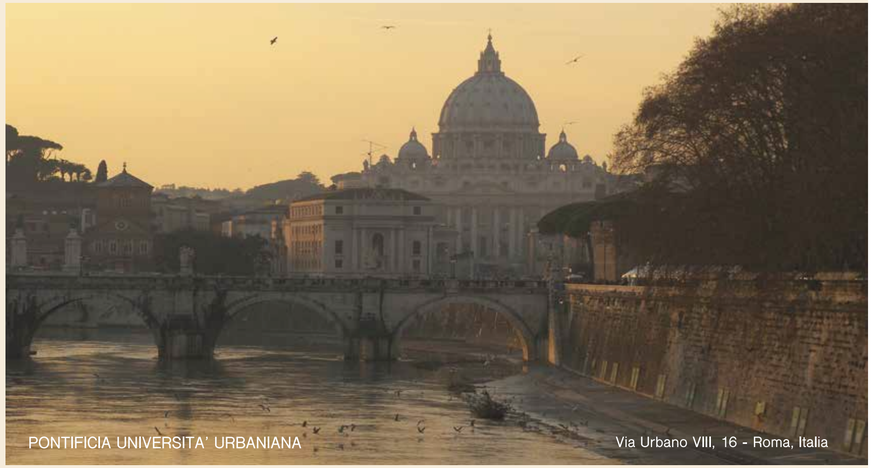

The Conference Banquet will be held on Thursday June 2nd at 8.00 pm at Palazzo Brancaccio, one of the most outstanding patrician palaces in Rome, with a beautiful park where you will also admire the small and charming Hunting Lodge.

ENEA - DEPARTMENT OF FUSION AND TECHNOLOGY FOR NUCLEAR SAFETY AND SECURITY
PSI 2016 Scientific Secretariat: psi2016@enea.it - 0039.334.6315203

XXII PSI Roma 2016

# 22nd International Conference on
# Plasma Surface Interactions
## in Controlled Fusion Devices

Roma, May 30 - June 3, 2016




# AGENDA

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organized by

ENEA
ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT

# PSI 2016 Schedule Plan

## Aula Magna

### SUNDAY - MAY 29

| | | Start | Duration |
|---|---|---|---|
| | Registration and Welcome cocktail | 15:00 | 05:00 |
| | Tutorials - Auditorium | | |
| T 1 | R. Albanese - Guidelines for the design of a tokamak device | 16:00 | 00:55 |
| T 2 | C. Linsmeier - New plasma facing materials | 16:55 | 00:55 |
| | Coffee break (Ground Floor) | 17:50 | 00:20 |
| T 3 | P. Stangeby - Two-point Modeling of the Divertor SOL | 18.10 | 00:55 |
| T 4 | R. Reichle - ITER PSI diagnostics | 19:05 | 00:55 |

### MoNDAY - MAY 30

| | | Start | Duration |
|---|---|---|---|
| | Registration | 08:00 | 00:50 |
| | Opening | 08:50 | 00:30 |
| • | **Session 1** (Y. Ueda) | | |
| R 1 | Y. Hatano - Fuel retention and transport in tungsten: neutron irradiation, seeded impurities, alloying and isotope effects | 09:20 | 00:40 |
| I 1 | M. Rubel - An Overview of Fuel Inventory and Deposition in Castellated Beryllium Structures in JET | 10:00 | 00:30 |
| O 1 | G. Tynan - Experimental study of deuterium retention and thermo-mechanical properties in ion-beam displacement-damaged tungsten | 10:30 | 00:20 |
| | Coffee break (Ground Floor) | 10:50 | 00:25 |
| • | **Session 1** (c'ued: G. Maddaluno) | | |
| O 2 | S. Markelj - The first study of deuterium retention in tungsten simultaneously damaged by high energy W ions and loaded by D | 11:15 | 00:20 |
| O 3 | L. Gao - Reconstructing the Deuterium Depth Profile in Plasma-loaded Tungsten | 11:35 | 00:20 |
| O 4 | M. Mayer - Erosion, deposition and deuterium inventory of the bulk tungsten divertor tile during the first JET ITER-like wall campaign | 11:55 | 00:20 |
| O 5 | J. Likonen Deuterium release and trapping in ITER-Like co-deposited layers | 12:15 | 00:20 |
| | Lunch (Ground Floor) | 12:35 | 01:25 |
| • | **Session 2** (T. Leonard) | | |
| I 2 | O. E. Garcia - SOL width and intermittent fluctuations in KSTAR | 14:00 | 00:30 |
| O 6 | N. Walkden - Measurement and modelling of intermittent transport phenomena in the MAST scrape-off layer | 14:30 | 00:20 |
| O 7 | M. Jakubowski - Scrape-off layer physics in the initial campaign of Wendelstein 7-X | 14:50 | 00:20 |
| • | **Session 3** (S.H. Hong) | | |
| O 8 | S. Jachmich - Disruption mitigation experiments at JET in support of ITER | 15:10 | 00:20 |
| O 9 | C. Grisolia - Tungsten dust in fusion devices: impact of morphology of particles on tritium retention/desorption, associated toxicological studies | 15:30 | 00:20 |
| O 10 | S. Ratynskaia - Tungsten dust remobilization under steady-state and transient plasma conditions | 15:50 | 00:20 |
| | Poster-1 and Coffee break | 16:10 | 02:30 |
| | Conference Reception - Castel Sant'Angelo, Lungotevere Castello 50 | 20:00 | 02:00 |

T= Tutorial  I= Invited  R= Review  O= Oral

### TUESDAY - MAY 31

| | | Start | Duration |
|---|---|---|---|
| | Hall open | 08:00 | |
| • | **Session 4** (M. Groth) | | |
| R 2 | S. Wiesen - Plasma-edge and plasma-wall interaction modelling: lessons learned from metallic devices | 08:30 | 00:40 |
| I 3 | T. Rognlien - Comparison of 2D simulations of detached divertor plasmas with divertor Thomson measurements in the DIII-D tokamak | 09:10 | 00:30 |
| O 11 | E. Kaveeva - SOLPS-ITER modelling of the ITER edge plasma with drifts and currents | 09:40 | 00:20 |
| O 12 | I. Paradela Perez - SOL parallel momentum loss in ASDEX-Upgrade and comparison with SOLPS | 10:00 | 00:20 |
| O 13 | Z. Yang - SOLPS modeling of radiative divertor experiments with impurity seeding in EAST | 10:20 | 00:20 |
| | Coffee break (Ground Floor) | 10:40 | 00:20 |
| • | **Session 4** (c'ued: K. Krieger) | | |
| O 14 | G. Ciraolo - H-mode WEST tungsten divertor operation: deuterium and nitrogen seeded simulations with SOLEDGE2D-EIRENE | 11:00 | 00:20 |
| O 15 | F. Reimold - The High-field Side High Density Region in SOLPS-Modeling of Nitrogen-seeded H-Modes in ASDEX Upgrade | 11:20 | 00:20 |
| I 4 | G. Meisl - Nitrogen migration in ASDEX Upgrade and JET: Understanding the dependence on surface temperature, roughness and N transport in the SOL | 11:40 | 00:30 |
| • | **Session 5** (G. N. Luo) | | |
| I 5 | R. Zagorski - Evaluation of the power and particle exhaust performance of various alternative divertor concepts for DEMO | 12:10 | 00:30 |
| O 16 | N. Asakura - Simulation Studies of the Divertor Geometry and Plasma Parameters for 1.5 GW Fusion Power Demo Reactor | 12:40 | 00:20 |
| | Lunch (Ground Floor) | 13:00 | 01:10 |
| • | **Session 6** (E. Tsitrone) | | |
| I 6 | R. Pitts - Physics conclusions in support of ITER W divertor monoblock shaping | 14:10 | 00:30 |
| I 7 | J. Gunn - Ion orbit modelling of surface heat loads on ITER divertor vertical targets | 14:40 | 00:30 |
| O 17 | S. Panayotis - Self-castellation of tungsten monoblock under High Heat Flux loading and impact of material properties | 15:10 | 00:20 |
| I 8 | F. Ding - Commissioning and PSI behavior of the ITER-like W/Cu divertor in EAST | 15:30 | 00:30 |
| O 18 | A. Herrmann - Experiences with a solid tungsten divertor in ASDEX Upgrade | 16:00 | 00:20 |
| O 19 | R. Bisson - Understanding the retention of hydrogen isotopes and controlling their release: an integrated approach applied to tungsten materials | 16:20 | 00:20 |
| | Poster-2 and Coffee break | 16:40 | 02:30 |

### WEDNESDAY - JUNE 1

| | | Start | Duration |
|---|---|---|---|
| | Hall open | 08:00 | |
| • | **Session 7** (V. Safronov) | | |
| R 3 | M. Jaworski - Liquid metals as plasma-facing components: progress and prospects | 08:30 | 00:40 |
| I 9 | G. Mazzitelli - Liquid metals: feedback from FTU | 09:10 | 00:30 |
| O 20 | T. Morgan - Power handling of a liquid-metal based CPS structure under high steady state heat and particle fluxes | 09:40 | 00:20 |
| • | **Session 8** (R. Doerner) | | |
| I 10 | D. Goebel - Plasma-Surface Interactions in Space Propulsion Environments | 10:00 | 00:30 |
| | Coffee break (Ground Floor) | 10:30 | 00:20 |
| • | **Session 9** (S. Brezinsek) | | |
| I 11 | T. Eich - ELM divertor heat load scaling to ITER with data from JET, ASDEX Upgrade and MAST | 10:50 | 00:30 |
| O 21 | B. Sieglin - Density Dependence of SOL Power Width in ASDEX Upgrade L-Mode | 11:20 | 00:20 |
| O 22 | L. Wang - Effect of Heating Scheme on SOL Width in DIII-D and EAST | 11:40 | 00:20 |
| O 23 | G. Matthews - Energy Balance in JET | 12:00 | 00:20 |
| O 24 | C. Guillemaut - Evidence for enhanced main chamber wall plasma loads in JET ITER-like Wall at high radiated fraction | 12:20 | 00:20 |
| | Lunch (Ground Floor) | 12:40 | 01:20 |
| | Excursion to roman Forums and Coliseum - Meeting Point: via di Foro Traiano, 1 | 14:30 | |

### ThUrSDAY - JUNE 2

| | | Start | Duration |
|---|---|---|---|
| | Hall open | 08:00 | |
| • | **Session 10** (T. Nakano) | | |
| R 4 | R. Dux - The Interplay of Controlling the Power Exhaust and the Tungsten Content in ITER | 08:30 | 00:40 |
| I 12 | M. Reinke - Expanding the role of impurity spectroscopy for investigating the physics of high-Z dissipative divertors | 09:10 | 00:30 |
| I 13 | A. Huber - Comparative H-mode density limit studies in JET and AUG | 09:40 | 00:30 |
| O 25 | B. Lipschultz - Directions towards improvement of divertor detachment control and power dissipation | 10:10 | 00:20 |
| | Coffee break (Ground Floor) | 10:30 | 00:20 |
| • | **Session 10** (c'ued: N. Asakura) | | |
| I 14 | M. Bernert - Power exhaust by SOL and pedestal radiation at ASDEX Upgrade and JET | 10:50 | 00:30 |
| O 26 | H. Tanaka - Impacts of nitrogen and neon seeding on the divertor particle and heat loads in LHD | 11:20 | 00:20 |
| O 27 | D. Brunner - Divertor heat flux mitigation and plasma performance optimization via feedback control of nitrogen seeding in Alcator C-Mod's high-Z vertical target plate divertor | 11:40 | 00:20 |
| I 15 | Z. Sun - Exploring steady-state ELM-free H-mode plasmas for heat flux control on EAST | 12:00 | 00:30 |
| | Lunch (Ground Floor) | 12:30 | 01:10 |
| • | **Session 11** (G. Matthews) | | |
| I 16 | Y. Nakamura - A comprehensive study on impurity behavior in LHD long pulse discharges | 13:40 | 00:30 |
| O 28 | R. Ding - High-Z materials erosion and its control in DIII-D carbon divertor | 14:10 | 00:20 |
| O 29 | T. Abrams - Impact of ELMs on the tungsten source distribution near the DIII-D outer strike point: measurements and modeling | 14:30 | 00:20 |
| O 30 | A. Eksaeva - ERO modelling of tungsten erosion in the linear plasma device PSI-2 | 14:50 | 00:20 |
| • | **Session 12** (R. Doerner) | | |
| O 31 | L. Laguardia - Influence of He and Ar injection on ammonia production in N2/D2 plasma in the medium flux GyM device | 15:10 | 00:20 |
| O 32 | G. de Temmerman - Efficiency of thermal outgassing for tritium retention measurement and removal in ITER | 15:30 | 00:20 |
| I 17 | F. Colao - LIBS experiments for quantitative detection of retained fuel | 15:50 | 00:30 |
| | Poster-3 and Coffee break | 16:20 | 02:30 |
| | Conference Dinner: at Palazzo Brancaccio - viale del Monte Oppio, 7 Rome | 20:00 | 03:00 |

### FriDAY - JUNE 3

| | | Start | Duration |
|---|---|---|---|
| | Hall open | 08:00 | |
| • | **Session 13** (M. Fenstermacher) | | |
| R 5 | E. Wolfrum - Impact of wall materials and seeding gases on the pedestal and on core plasma performance | 08:30 | 00:40 |
| I 18 | A.R. Briesemeister - Measurements and modeling of the effects of resonant magnetic field perturbations on high-recycling and detached divertor plasmas in DIII-D | 09:10 | 00:30 |
| O 33 | A. Chankin - Possible influence of near SOL plasma on the H-mode power threshold | 09:40 | 00:20 |
| O 34 | J. W. Ahn - Effect of pedestal stability regime on the behavior of ELM heat flux footprints in NSTX, DIII-D, and NSTX-U | 10:00 | 00:20 |
| I 19 | B. La Bombard - High-field side scrape-off layer investigation: plasma profiles and impurity screening behavior in near-double-null configurations | 10:20 | 00:30 |
| | Coffee break (Ground Floor) | 10:50 | 00:20 |
| • | **Session 14** (R. Neu) | | |
| I 20 | M. Wirtz - Transient Heat Load Challenges for Plasma-Facing Materials during Long-Term Operation | 11:10 | 00:30 |
| I 21 | D.V. Kovalenko - Behavior of divertor and first wall armour materials at plasma heat fluxes relevant to ITER ELMs and disruptions | 11:40 | 00:30 |
| O 35 | J. Linke - Surface modification of Be and Be-coatings induced by intense transient thermal loads | 12:10 | 00:20 |
| I 22 | Y. Kikuchi - Plasma-vapor mixed layer formation and its effects on energy transfer processes from ELM-like pulsed plasma heat loads to tungsten materials | 12:30 | 00:30 |
| O 36 | K. Ibano - Observation of vaporized W, Mo, and Be in PISCES-B plasma and validation of a particle code for the vapor-shielding study | 13:00 | 00:20 |
| | Closing | 13:20 | 00:20 |