

4th Joint Nordic Fusion Energy Seminar 2023

DAY 1 Monday 12 June 2023

10:00 – 13:00 Plenary session: General overview talks (30+5') Chair: P. Strand

10:00		Introduction and welcome
10:05	Ian Chapman, UKAEA, UK	The fusion landscape in Culham seen by UKAEA
10:40	Joelle Mailloux, UKAEA, UK	JET DT experiments

11:15-11:30 Coffee Break

General overview talks - continued Chair: T. Tala

11.30	Volker Naulin, EUROfusion	EUROfusion FSD and plans for ITER (25+5')
12:00	Otto Asunta, Tokamak Energy, UK	Tokamak Energy -- Overview and recent achievements (25+5')
12:30	Peter Roos, Novatron Fusion, SE	Novatron Concept (12+2')
12:45	Patrik Carlsson, BiSS, SE	Big Science Sweden support to fusion in northern Europe (12+2')

13:00-14:00 Lunch

14:00 – 14:15 New Members Chair: P. Strand

14:00	Odd Erik Garcia, Tromsø, NO	Fusion plasma physics research in Norway (12+2')
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14:15– 15:55 Plenary session: Materials & DONES (20+5') Chair: S. Kragh-Nielsen

14:15	Eduardo Pitthan, UU, SE	Electronic interactions of slow ions and their influence on defect formation & sputter yields for plasma facing components
14:40	Fredric Granberg, UH, FI	High-dose and long time scale simulations of defect evolution in fusion material
15:05	Per Petersson, KTH, SE	Material analysis and material modification by ion beams.
15:30	Wolfgang Pantleon, DTU, DK	Tungsten-based materials for plasma-facing components and their thermal stability

15:55-16:15 Coffee Break

16:15 – 18:20 Parallel session: Transport & Modelling, Remote Maintenance, Diagnostics and Heating (20+5')

16:15	<p>Transport:</p> <p>Juuso Karhunen, VTT, FI Emil Fransson, Chalmers, SE Lorenzo Frassinetti, KTH, SE</p> <p>Alexander Simon Thryssøe, DTU, DK Ladislav Vignitchouk, KTH, SE</p>	<p style="text-align: right;">Chair: P. Strand</p> <p>STEP modelling with ITER-SOLPS Modelling of the Isotope effect Effect of the isotope mass on the pedestal structure and pedestal stability The Plasma Potpourri of PPFE: Modelling isotopes, neutrals, and NORTH Modelling of PFC melting events, dust production and transport</p>
16:15	<p>Remote maintenance:</p> <p>William Brace, VTT, FI</p>	<p style="text-align: right;">Chair: T. Tala</p> <p>Mobile Monitoring Design Approach for Fusion Power Plant</p>

	Huapeng Wu, LUT, FI Laura Goncalves Ribeiro, TUNI, FI Christoffer Sloth, SDU, DK Hjalte Durocher, AU, DK	The research activities on robotic maintenance for fusion reactors in LUT university Target Tracking Using Optical Markers for Remote Handling in ITER Remote Maintenance: Challenges in the Manipulation of High-Mass Payloads Robotic Handling of Breeding Blanket Segments: Kinematics and Motion Planning
16:15	Diagnostics & Heating: Antti Salmi, VTT, FI Ricardo Ragona, DTU, DK Anders Hjalmarsson, UU, SE Jacob Eriksson, UU, Sverige Søren Bang Korsholm, DTU, DK	Chair: S. Kragh-Nielsen Steady-state magnetic field sensor development in ENR Non-linear effect during electron cyclotron resonance heating The ITER High Resolution Neutron Spectrometer (HRNS) project Physics results using neutron data in the JET DTE2 campaign The ITER Collective Thomson scattering system

18:30 Seminar Dinner

DAY 2 Tuesday 13 June 2023

9:00 – 10:40 Plenary session: Fusion and Nuclear Technologies in ITER and DEMO (20+5')

Chair: T. Tala

9:00	Marton Szogradi, VTT, FI	Apros-based activities in the Balance of Plant EUROfusion work package of DEMO
9:25	Antti Hakola, VTT, FI	Plasma-wall-interaction studies for preparation of ITER and DEMO first wall
9:50	Xuping Zhang, AU, DK	Robotic Interaction and Its Application to Remote Maintenance of Fusion Reactors
10:15	Markus Airila, VTT, FI	Radioactive Waste Management in Fusion Power Plants: Specificities and Analogies from Fission

10:40-11:00 Coffee Break

11:00-13:00 Parallel Session: EUROfusion student & grantee elevator talks (12+2')

11:00	Plasma Physics & Modelling:	Chair: P. Strand
	Roni Mäenpää, Aalto, FI	Nitrogen molecular dissociation reactions in the JET divertor
	Henrik Järleblad, DTU, DK	A Framework for Synthetic Diagnostics using Energetic-particle Orbits in Tokamaks
	Andreas Gillgren, Chalmers, SE	Using machine learning to predict and understand pedestal dependencies
	Ida Ekmark, Chalmers, SE	Multi-objective Bayesian optimization of tokamak disruptions using fluid and kinetic models

	Björn Zaar, KTH, SE	Iterative method for including spatial dispersion in ICRH modelling
	Hampus Nyström, KTH, SE	Effect of resistivity on the pedestal MHD stability in JET
	Johan Kølsten de Wit, DTU, DK	A bispectral analysis of parametric decay instabilities in plasma
	Francis Devasagayam, Aalto, FI	Gyrokinetic simulations of GAM-Turbulence interplay in the FT-2 tokamak
11:00	<u>Technology & Diagnostics:</u>	Chair: T. Tala
	Théo Verdier, DTU, DK	FPGA-based digitizer and radially-resolved ion dynamics with Collective Thomson scattering at ASDEX Upgrade
	Zhixin Yao, LUT, FI	Digital twin based real-time precision control of heavy-load manipulator for CFETR
	Qi Wang, LUT, FI	Parameter identification of heavy-duty manipulator using stochastic gradient Hamilton Monte-Carlo method.
	Truong Van Dung, VTT, FI	Design for minimum risk in fusion power plant
	Benjamin Eriksson, UU, SE	Fundamental nuclear physics studies in fusion plasmas - the $T+T \rightarrow (5\text{-He}^* + n) \rightarrow 4\text{He} + n+n$ reaction
	Quas Saifi, VTT, FI	Recursive probabilistic state estimation
	Raheesty Devi Nem, DTU, DK	Upgraded Infrared System for ASDEX Upgrade
	Mads Rud Larsen, DTU, DK	Orbit sensitivity and phase-space tomography using projected velocities in constants-of-motion space
11:00	<u>Materials, Neutronics and Fast Particles:</u>	Chair: S. Kragh-Nielsen
	Aslak Fellman, UH, FI	Enabling accurate materials modelling by Machine Learning

	Otso Hyvärinen, Aalto, FI	Fusion-alpha power loads in ITER: sensitivity to the radial displacement of toroidal field coils and plasma-facing components
	Evgeniia Ponomareva, Aalto, FI	Electronic losses of the light ions in plasma-facing components
	Konstantinos Paschalidis, KTH, SE	Capabilities and applications of the MEMENTO melt dynamics code
	Lucia Sanchis, Aalto, FI	Modelling of particle species effect on beam-ion losses in W7X
	Andrea Valentini, DTU, DK	Study of Fast Ion 3D Weight Functions for 2-step Gamma-Ray reactions
	Bernard Charles Reman, DTU, DK	Measurements of fast-ion distributions by velocity-space tomography
	Jila Shams-Latifi, UU, SE	Energy deposition of slow protons and He+ ions in W and EUROFER97 bulk and sputtered thin-films

13:00-14:00 Lunch**14:00 – 16:00 Plenary session: Burning plasma physics (20+5')****Chair: S. Kragh-Nielsen**

14:00	Istvan Pusztai, Chalmers, SE	Runaway electron dynamics in shattered pellet mitigated ITER disruptions
14:25	Aaro Järvinen, VTT, FI	Bayesian approach for validating runaway electron simulations in the Finnish Advanced Computing Hub
14:50	Jesper Rasmussen, DTU, DK	Fast ion physics in ASDEX-U
15:15	Antti Snicker, Aalto, FI	ASCOT simulations to support ITER FILD project
15:50	Pär Strand, Chalmers, SE	Closing