

Session Program

9–12 Dec 2025

Workshop on Digital Engineering for Fusion Energy Research

Simulation and Modelling Techniques

Cambridge, Massachusetts, USA
Hacker Reactor at MIT's iHQ. Address: 292 Main Street | MIT Bldg. E38 | Floor 7 | Cambridge, MA 02142

Tuesday 9 December

11:00

Simulation and Modelling Techniques

Session |

Location: Cambridge, Massachusetts, USA, Hacker Reactor at MIT's iHQ. Address: 292 Main Street | MIT Bldg. E38 | Floor 7 | Cambridge, MA 02142

11:00–11:30

An Integrated Multi-physics Platform for the LIBRTI Facility

Speaker

Helen Brooks

11:30–11:55

Multi-physics tritium transport modelling of the ARC breeding blanket with FESTIM

Speaker

Dr James Dark

11:55–12:20

Overview of the capabilities in the Multiphysics Object Oriented Simulation Environment and recent activities in modeling and simulation for fusion energy systems

Speaker

Guillaume Giudicelli

12:30

14:00

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14:00–14:30

Overview of the PSFC blanket and fuel cycle modelling activities

Speaker

Remi Delaporte-Mathurin

14:30–14:55

Towards a Tritium Breeder Digital Twin

Speaker

Albrecht Kyrieleis

14:55–15:20

ARC Divertor and Heat Exchanger Thermal Hydraulic Modeling using the Nek5000 CFD Code

Speaker

Lane Carasik

15:20

15:45

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15:45–16:15

First-Principles-Based Divertor Optimization: A Unified MCF Divertor Framework Applied to Wendelstein 7-X

Speaker

Dr Thierry Kremeyer

16:15–16:40

Advancing SPARC Design Through Deterministic Methods: An Overview

Speaker
Andrea Saltos

16:40–17:05 **Divertor Monoblock Multiphysics Analysis Using the SALAMANDER Code**

Speaker
Lane Carasik

17:05

Wednesday 10 December

10:50

Simulation and Modelling Techniques

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10:50–11:20

Towards Accurate Uncertainty Estimates in High-Fidelity Radiation Transport Simulations of Fusion Power Plants

Speaker

Ethan Peterson

11:20–11:45

Coupled Neutronics–CFD Workflow for ARC Tokamak Blanket and Coolant Design

Speaker

Austin Carter

11:45–12:10

Tokamak Model Digital Lifecycle for Neutronics Simulation Applications

Speakers

Amanda Johnson, Loren Brandenburg

12:30

Thursday 11 December

09:00

Simulation and Modelling Techniques

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09:00–09:30

Digital Design and Safety Evaluation of Superconducting Magnet Systems for Fusion Device

Speaker

JINXING Zheng

09:30–09:55

REIMS - Riemann Explicit Implicit Magnet Simulator, new tool for calculating superconductor performance

Speaker

Dr Jacek Kosek

09:55–10:25 (title pending) MOOSE electromagnetics

Speaker

Alexander Blair

10:25

14:00

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14:00–14:30 Virtual Tokamak for Integrated Physics and Engineering Analysis

Speaker

Dr Chanyoung Lee

14:30–14:55

Fusion Middleware. A comparison of state of the art systems in research, industrial manufacturing and cloud.

Speaker

Moritz Kröger

14:55–15:25

FREDA: A Multi-Fidelity Plasma-Engineering Integrated Modeling Platform for Fusion Reactor Design and Assessment

Speaker

Cami Collins

15:25

15:50

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15:50–16:20 Cardinal: Multiphysics and Multiscale Simulation for Fusion Applications

Speaker

April Novak

16:20–16:45

Validation of FESTIM Hydrogen Transport Modeling in FLiBe Through HYPERION Permeation Data

Speaker

Huihua Yang

16:45–17:15

Integration of Customized MHD Modeling into a Digital Engineering Workflow for Advanced Liquid Metal Blankets

Speaker

Andrei Khodak

17:15

Friday 12 December

10:50

Simulation and Modelling Techniques

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10:50–11:20

Data-Driven Prediction of Parametric Sensitivities of Stellarator Blanket Performance

Speaker

Connor Moreno

11:20–11:45

Tools to Support Geometry and Meshing Needs for Fusion Energy System Simulation Codes

Speaker

Mark Shephard

11:45–12:10

Fusion Energy System ARC System Modeling using SAM

Speaker

Lane Carasik

12:10–12:30

Wrap-up / Discussion

12:30