Multi-Fidelity Methods for Fusion Energy Tutorials

Tuesday March 10, 2026

8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*

8:55–9:00 *Welcome and Opening Remarks*

9:00–10:15 **Lise-Marie Imbert-Gerard** (University of Arizona)
An introduction to magnetic confinement in toroidal devices

10:15–10:45 *Break*

10:45–12:00 **Frank Jenko** (Max Planck Institute for Plasma Physics/TU Munich)
Towards Digital Twins of Fusion Systems

12:00–12:30 *Core Orientation (MFE2026)*

12:30–2:00 *Lunch (on your own)*

2:00–3:15 **Frank Jenko** (Max Planck Institute for Plasma Physics/TU Munich)
Plasma Models in Fusion Research

3:15–3:45 *Break*

3:45–5:00 **Tomo-Hiko Watanabe** (Nagoya University)
Zonal flows and turbulence in helical systems: a tutorial

Wednesday March 11, 2026

8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*

9:00–10:15 **Emily Belli** (General Atomics)
Computational plasma physics for turbulence & integrated modeling of transport

10:15–10:45 *Break*

10:45–12:00 **Omar Hurricane** (Lawrence Livermore National Laboratory)
Virtual Talk - Inertial Confinement

12:00–2:00 *Lunch (on your own)*

2:00–3:15 **John Jakeman** (Sandia National Laboratories)
Forward Uncertainty Quantification

3:15–3:45 *Break*

3:45–5:00 **Tim Wildey** (Sandia National Laboratories)
Inverse Uncertainty Quantification with PyApprox

Thursday March 12, 2026

8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*

9:00–10:15 **Jaime Marian** (University of California, Los Angeles (UCLA))
Modeling and Simulation Techniques for Structural Materials Under Fusion Conditions

10:15–10:45 *Break*

10:45–12:00 **Boris Kramer** (University of California San Diego)
Robust Design Optimization

12:00–2:00 *Lunch (on your own)*

2:00–3:15 **Jochen Garcke** (Universität Bonn and Fraunhofer SCAI)
Introduction to Machine Learning for Science and Engineering

3:15–3:45 *Break*

3:45–5:00 **Ionut-Gabriel Farcas** (Virginia Tech)
Talk II -A tutorial on multi-fidelity methods for fusion energy research

Friday March 13, 2026

8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*

9:00–10:15 **Ionut-Gabriel Farcas** (Virginia Tech)
Talk II -A tutorial on multi-fidelity methods for fusion energy research

10:15–10:45 *Break*

10:45–12:00 **Andrew Christlieb** (Michigan State University)
An introduction to Scientific Machine Learning

12:00–2:00 *Lunch (on your own)*

2:00–3:15 *Research groups conversation*