ICDDPS-7 – Scientific Program

Book of Abstracts
The book of abstracts will be available to registered participants at:
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Agenda

Time	Monday (Aug. 3)	Tuesday (Aug. 4)	Wednesday (Aug. 5)	Thursday (Aug. 6)	Friday (Aug. 7)
8:00–9:00	Registration & Coffee	Registration & Coffee	Registration & Coffee	Registration & Coffee	Registration & Coffee
9:00–10:00	9:00 Opening 9:15 **PL-1** Siddhartha Mishra	**PL-2** Stefano Markidis	**PL-3** Peter Messmer	**PL-4** Lu Lu	**PL-5** Jonathan Citrin
10:00–10:30	10:15 Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:30–11:00	**I-1** Stefan Dasbach	**I-7** Christina Venturini	**I-13** Hae June Lee	**I-15** Kentaro Hara	**I-20** Motoki Nakata
11:00–11:30	**I-2** Shinya Maeyama	**I-8** David Garrido Gonzalez	**I-14** Hironori Moki	**I-16** George Miloshevich	**I-21** Dirk Reiser
11:30–11:45	**O-1** David Kivarkis	**O-11** Andrea Loreti	**O-21** Cameron Wagoner	**O-23** Taejun Park	**I-22** Seolhye Park
11:45–12:00	**O-2** Yuya Suzuki	**O-12** Liyun Zhang	**O-22** Zhehui Wang	**O-24** Pietro Dazzi	
12:00–13:30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Closing & Lunch Break
13:30–14:00	**I-3** Sanghoo Park	**I-9** Alexander Scheinker	*Explore Kiel*	**I-17** Kookjin Lee	
14:00–14:30	**I-4** Joe Lu	**I-10** Manuel Kirchen		**I-18** Doohyun Kim	
14:30–14:45	**O-3** Ji-Won Kwon	**O-13** Paul Gellersen		**O-25** Willca Villafana	
14:45–15:00	**O-4** Rim Ettouri	**O-14** Yoeri Poels		**O-26** Jihoon Park	
15:00–15:15	**O-5** Tsung-Hsuan Yang	**O-15** CheolSik Byun		**O-27** Andrew Powis	
15:15–15:30	**O-6** Dennis Barton	**O-16** Alvin Garcia		**O-28** Takeo Hoshi	
15:30–16:00	Coffee Break	Coffee Break		Coffee Break	
16:00–16:30	**I-5** Chuanfei Dong	**I-11** Kelly Moran		**I-19** Qiang Wang	
16:30–17:00	**I-6** Takashi Nishizawa	**I-12** Bogdan Kustowski		**Poster Session**	
17:00–17:15	**O-7** Cristian Flores	**O-17** Rafel Bordas			
17:15–17:30	**O-8** Zander Keith	**O-18** James Allison			
17:30–17:45	**O-9** Nathaniel Saura	**O-19** Abetharan Antony			
17:45–18:00	**O-10** Daan van Vugt	**O-20** Mohammed Koubiti			
18:00–19:30	**Welcome Reception**			19:00 **Banquet**	

Legend: **PL** = Plenary, **I** = Invited Talk, **O** = Oral Contribution

List of Plenary Presentations

PL-1	Siddhartha Mishra	AI for data-driven simulations in Physics
PL-2	Stefano Markidis	Earth's Magnetosphere as a Distribution: Learning a Generative Atlas of Plasma Environments
PL-3	Peter Messmer	Harnessing AI compute power for data-driven plasma science
PL-4	Lu Lu	Learning operators and diffusion models over function spaces
PL-5	Jonathan Citrin	TORAX: A Fast and Differentiable Tokamak Transport Simulator in JAX

List of Invited Presentations

I-1	Stefan Dasbach	Deep learning for estimation and control of power plant scale exhaust
I-2	Shinya Maeyama	Turbulent transport modeling in magnetic fusion plasma using a multi-fidelity data fusion approach
I-3	Sanghoo Park	Deep Spectral Deconvolution for Image-Based Spectral Plasma Data Analysis
I-4	Joe Lu	Data-Driven Plasma Process Development via Human–Machine Collaboration and Virtual Twins Under Extreme Data Scarcity
I-5	Chuanfei Dong	Toward Data-Driven Kinetic Plasma Modeling: From Landau Damping to Turbulence
I-6	Takashi Nishizawa	Physics-Informed Multidimensional Nonparametric Inference Using Gaussian Processes
I-7	Christina Venturini	Data-driven surrogate diagnostic for kinetic profile reconstruction on tokamaks
I-8	David Garrido Gonzalez	Geometry-Aware Reduced Order Modelling of Parameter-Dependent Nonlinear Partial Differential Equations
I-9	Alexander Scheinker	Autoregressive Latent Diffusion for Magnetohydrodynamics
I-10	Manuel Kirchen	Data-Driven Modelling and Control of Laser-Plasma Accelerators
I-11	Kelly Moran	From diagnostics to discovery: Statistical inference for uncertainty-aware ICF analysis
I-12	Bogdan Kustowski	Automating the search for robustly igniting ICF designs using ML-augmented optimization on the exascale computer El Capitan
I-13	Hae June Lee	Prediction of spatiotemporal distributions of RF capacitively coupled plasmas using neural networks
I-14	Hironori Moki	Surrogate Modeling for Plasma Simulation
I-15	Kentaro Hara	State and parameter estimation of partially ionized gases using data assimilation
I-16	George Miloshevich	TBD
I-17	Kookjin Lee	Neural Operators and Physics-Informed Approaches for Parameterized 1D Capacitively Coupled Plasma Systems
I-18	Doohyun Kim	How does data-driven AI transform the semiconductor processing and manufacturing technologies
I-19	Qiang Wang	Deep Neutral Network (DNN) based Surrogate Modeling for Electron Energy Distribution Function (EEDF) Simulation in High Density Plasma
I-20	Motoki Nakata	Quantum-information-theoretic measures for turbulence and transport
I-21	Dirk Reiser	Machine Learning for Surface Morphology Studies and Erosion Physics
I-22	Seolhye Park	Designing and Setting up the New OLED Display Mass-Producing Fab Referring to Plasma Information-based Virtual Metrology (PI-VM)

List of Contributed Oral Presentations

O-1	David Kivarkis	Autoregressive prediction of zonal flows in resistive drift-wave turbulence using Koopman transformers and wavelet compression
O-2	Yuya Suzuki	The development of anomaly detection models using visible camera images and Deep Learning in LHD
O-3	Ji-Won Kwon	Self-Improving Etch Depth Control Methodology Using Plasma Information-Based Virtual Metrology with Model-Selective Non-Maxwellian EEDF
O-4	Rim Ettouri	Regression Models for Multiscale Bosch Plasma-Surface Interactions
O-5	Tsung-Hsuan Yang	Process Optimization by Combining Machine Learning and Plasma Simulation in Thin Film Deposition
O-6	Dennis Barton	Digital Modelling of an Industrial Inline Sputtering System - passing the Turing-Test for a practical application
O-7	Cristian Flores	Data-driven development and validation of an equivalent electric circuit for a filamentary dielectric barrier discharge
O-8	Zander Keith	Benchmarking Hybrid Models for Full-Shot Transport Prediction
O-9	Nathaniel Saura	Data-driven reconstruction of nuclear thermal effects in ITER fusion power scenario
O-10	Daan van Vugt	Accelerating plasma simulation with ML-assisted matrix solver configuration, solution prediction and preconditioning
O-11	Andrea Loreti	Learning Compact Representation of Plasma States From the FAIR-MAST Dataset
O-12	Liyun Zhang	Neural-Network-based Probabilistic Surrogate Modeling for Rapid Bayesian Inference in Thomson Scattering Diagnostics
O-13	Paul Gellersen	Correlating post-wakefield acceleration laser spectra with electron beam spectra to build an indirect electron diagnostic
O-14	Yoeri Poels	Learning reduced plasma dynamics for analysis and control on TCV
O-15	CheolSik Byun	Bidirectional Diagnostic Coupling for Tokamak Divertor Detachment Control with Reduced Measurement Requirements
O-16	Alvin Garcia	Artificial Intelligence-based control of energetic particle instabilities on the DIII-D National Fusion Facility
O-17	Rafel Bordas	Scalarized Multi-Objective Bayesian Optimization of a Pulsed-Power-Driven Quasi-Isentropic Compression Inertial Fusion Target
O-18	James Allison	Bayesian Calibration of Liner experiments using Neural Posterior Estimation
O-19	Abetharan Antony	Neural Surrogates for Fast Rad-Hydro/MHD Modelling in Direct-Drive IFE and MagLIF
O-20	Mohammed Koubiti	Machine learning–enhanced plasma spectroscopy
O-21	Cameron Wagoner	Calculating Non-Local Electron Transport in a Low Temperature Plasma Using Machine Learning
O-22	Zhehui Wang	Data-driven Plasma Science in the Age of AIs
O-23	Taejun Park	Development of a PI-VM model for predicting wedge-shaped bowing in Si trench etching under $SF_6/O_2/Ar$ TVW-driven DF-CCP

O-24	Pietro Dazzi	Modelling of space plasma from Vlasov to fluid: machine learning applied to the closure problem
O-25	Willca Villafana	Gas Breakdown in Narrow Gaps for Semiconductor Applications: Bayesian Optimization of Particle-in-Cell Simulations
O-26	Jihoon Park	Metrology-Driven Material Probe: A Physics-Informed AI Framework for Feature-Resolved Interpreting Plasma–Surface Kinetics in High-Aspect-Ratio Etching
O-27	Andrew Powis	Surrogate model for Capacitively Coupled Plasma Discharge for Fast Predictions and Accelerated Kinetic Simulations
O-28	Takeo Hoshi	Interdisciplinary data-driven approach to fusion reactor development under the Japanese Moonshot R&D program

List of Contributed Poster Presentations

P-1	Yao-Li Liu	Genetic-Algorithm Optimization of Phase Matching for Ion-Based Isolated Attosecond keV X-ray High-Order Harmonic Generation
P-2	Giil Kwon	Development of a Deep Learning Model for Plasma Shape and Position Inference using KSTAR plasma video data
P-3	Wataru Kikuchi	Data-Driven OES Diagnostic Framework for Atmospheric-Pressure Non-Equilibrium Argon Plasmas via Weighted Multi-Objective Optimization
P-4	Waleed Mouhali	Data-driven reduced-order modeling of edge-plasma turbulence using Koopman transformers
P-5	Torben Schmitz	Compression and surrogate models for SDTrimSP-3D energy-angular-distributions of rough surfaces using autoencoders
P-6	Mitsuru Honda	Fourier Neural Operator Surrogate for the Fokker-Planck Equation toward Accelerated NBI Heating Calculations in Integrated Modeling
P-7	Hengyu Li	Development and Applications of ODAT-SE: An Open Platform for Inverse Problem Analysis
P-8	Ariel de Vora	In-situ Neural Data Compression for Gyrokinetic Exascale Simulations
P-9	Eric Calvet	Identifying an electron heat flux closure for the 1D Weibel instability via explainable AI and equation discovery
P-10	Matthew Anderson	Extension of a Boltzmann PINN for Automatic Maximum Electron Speed Calculation and Gas Mixture Support
P-11	Robert Wagner	Large Language Model-Assisted Semantic Statement Extraction and Curation from Plasma Science Publications
P-12	Yamato Esaki	Numerical investigation on electromagnetic fields measurement in laser-produced plasmas using Bayesian
P-13	Tsuyoshi Takami	Reconstruction of Turbulent Electric Fields in Laser-Driven Plasma Using Physics-Informed Neural Networks
P-14	Johannes Illerhaus	AIDA: Deep-Learning-Based Forecasting of IDA Profiles for Real-Time Plasma Control Applications at ASDEX Upgrade

P-15	Fuka Nikaido	Reconstruction of 3D electric and magnetic fields in laser-produced plasmas with nuclear track detectors using machine learning
P-16	Dimitri Boivin	Building an Experimental Database from HiPIMS and e-HiPIMS Experiments for Future Digital Twins
P-17	Kai Schneider	Two-dimensional continuous wavelet analysis of anisotropy and intermittency in drift-wave turbulence
P-18	withdrawn	
P-19	Jongchan Kim	AI-Assisted Spectral Analysis for Advanced Optical Plasma Diagnostics
P-20	Arun Kumar R M	Deep Learning methods for modelling Fuchs-scaling in Laser driven proton acceleration via Target Normal Sheath Acceleration
P-21	Chul-woong Kim	Frequency-Domain Neural Networks for Plasma Simulation : A Study on Harmonic Component Optimization
P-22	Ben Gilbart	Comparison of Temporal Deep Learning Approaches to Wafer Process Control in Inductively Coupled Plasma Systems
P-23	Felipe Nathan de Oliveira Lopes	Data-Driven Identification of Region-Dependent Pressure Tensor Closures in Turbulent Space Plasmas
P-24	Preeti Sar	A Generalized Machine Learning Framework for Synthetic Diagnostic Inference of Divertor Target Conditions
P-25	Luca Bonalumi	Reinforcement Learning for NTM Suppression: Robustness Assessment Under Realistic Plasma and Actuator Conditions
P-26	Sebatian de Pascuale	Using Transformational Machine Learning Techniques to Enable Controlled Predictions of Tokamak Plasma Exhaust
P-27	Jincheng Huang	Extracting stochastic model for predator-prey dynamic of turbulence and zonal flow with limited data
P-28	Matisse Lanzarone	Rapid Decision Trees for Surrogate Modeling of Linear Gyrokinetic Stability and Growth Rates
P-29	Paul Seo	A Multimodal XAI Framework with LLM-Assisted Hypothesis Generation for Mechanism Discovery in NF3/H2 Plasma Etching
P-30	Jiří Fujera	Comparison of MLM-supported spectral analysis with classical least-squares fitting approaches in OES
P-31	Peter Steiner	Fusion AI Toolkit & Hub (FAITH) A Development Toolkit for Tokamak Foundation Models
P-32	Chris Danly	Nuclear diagnostics for ICF: towards characterization of plasma variables
P-33	Ihda Chaerony Siffa	A Physics-Informed Neural Network Approach for Solving the Spatially Inhomogeneous Electron Boltzmann Equation Including Electron-Electron Interaction