Twenty-Second International Conference on Numerical Simulation of Plasmas

Ocean Place - Resort and Spa

Long Branch, NJ, USA

Sponsored by

Princeton Plasma Physics Laboratory

Princeton University

September 7 - 9, 2011

ICNSP2011 PROGRAM

Tuesday, September 6	Wednesday September 7	Thursday September 8	Friday September 9
	8:00am – 8:15am Welcome / Logistics Opening Remarks (Atlantic Ballroom II) 8:15am – 9:45am Oral Session 1 (Atlantic Ballroom II)	8:00am – 8:25am Oral Session 4 (Atlantic Ballroom II) 8:30am – 10:00am Oral Session 5A (Atlantic Ballroom II) & Oral Session 5B (Atlantic Ballroom IV/V)	8:00am – 9:30am Oral Session 7A (Atlantic Ballroom II) & Oral Session 7B (Atlantic Ballroom IV/V)
	9:45am Break	10:00am Break	9:30am Break
	10:15am – 12:15pm Oral Session 2A (Atlantic Ballroom II) & Oral Session 2B (Atlantic Ballroom IV/V)	10:30am – 12:30pm Oral Session 6A (Atlantic Ballroom II) & Oral Session 6B (Atlantic Ballroom IV/V)	10:00am – 12:30pm Oral Session 8A (Atlantic Ballroom II) & Oral Session 8B (Atlantic Ballroom IV/V)
	12:15pm Lunch	12:30pm Lunch	12:30pm Adjourn
	1:45pm – 3:15pm Oral Session 3A (Atlantic Ballroom II) & Oral Session 3B (Atlantic Ballroom IV/V)	2:00pm – 4:00pm Poster Session 2 (Atlantic Ballroom I) Refreshments	
	3:30pm – 5:30pm Poster Session 1 (Atlantic Ballroom I) Refreshments	4:15pm – 7:30pm New York Harbor Excursion	
6:30 pm - 9:30 pm Registration/ Town Hall Meeting (Atlantic Ballroom I)	6:30 pm – 8:30 pm Banquet (Atlantic Ballroom III)		
	8:00 - 10:00 pm Bonfire (weather permitting)		

Wednesday, September 7, 2011		
Welcome / Logistics / Opening Remarks		**Atlantic Ballroom II:**
8:00 – 8:10	W. W. Lee	Welcome / Logistics
8:10 – 8:15		Opening remarks

Wednesday, September 7, 2011		
Oral Session 1 – Chair:		**Atlantic Ballroom II:** **Plasma Physics related SciDAC Programs**
8:15 – 8:45	W. M. Tang	Scientific and Computational Challenges of the Fusion Simulation Program (FSP)
8:45 – 9:15	S. Klasky	In-situ Scientific Data Processing for Extreme Scale Computing
9:15 – 9:45	K.-L. Ma	Advanced Visualization Techniques for Plasma Physics Simulations
9:45 – 10:15		*Break*

Wednesday, September 7, 2011		
Oral Session 2A – Chair: J. Vay		**Atlantic Ballroom II:** **High Intensity Beams and Laser Plasma Interactions**
10:15 – 10:45	A. J. Kemp	Full-Scale Integrated Kinetic Simulations of Laser-Plasma Interactions on the multi-picosecond scale
10:45 – 11:15	Z. M. Sheng	Collisional effects on beam transport in dense plasma
11:15 – 11:45	F. Fiuza	Multi-Scale PIC Modeling of High Energy Density Scenarios: from Laboratory to Astrophysics
11:45 – 12:15	J. Qiang	Parallel Particle-In-Cell Simulation of High Intensity Beams
12:15		*Lunch*

Wednesday, September 7, 2011		
Oral Session 2B – Chair: A. Kritz		**Atlantic Ballroom III:** **RF Heating & Inertial Fusion**
10:15 –10:45	J. C. Wright	Time Dependent evolution of RF-generated non-thermal particle distributions in fusion plasmas
10:45 –11:15	M. M. Marinak	Advances in HYDRA and its applications to simulations of Inertial Confinement fusion targets
11:15 –11:45	D. Eder	Late-Time Numerical Simulations of High-Energy-Density Targets
11:45 –12:15	A. Markmann	Efficient Simulation of Electron Quantum Dynamics using the Kepler Predictor-Corrector Algorithm for One-Over-R Potentials
12:15		*Lunch*

Wednesday, September 7, 2011		
Oral Session 3A – Chair: S. Ethier		**Atlantic Ballroom II:** **High Performance Simulations and Visualization**
1:45 – 2:15	S. Ku	Utilizing extreme scale HPC for full-f gyrokinetic particle simulation in realistic diverted tokamak geometry
2:15 – 2:45	A. Sanderson	Interactive Exploration of Plasmas in Magnetic Confinement Fusion
2:45 – 3:15	A. Kageyama	Application framework for Immersive Virtual Reality Visualizations

Wednesday, September 7, 2011		
Oral Session 3B – Chair: P. Damiano		**Atlantic Ballroom III:** **Space and Astrophysical Plasmas**
1:45 – 2:15	A. Spitkovsky	Kinetic simulations of particle acceleration in astrophysical collisionless shocks
2:15 – 2:45	G. Howes	Gyrokinetic Simulations of Solar Wind Turbulence
2:45 – 3:15	R. Horiuchi	An anomalous resistivity in collisionless driven reconnection and its role in multi-hierarchy system

Wednesday, September 7, 2011			
Poster Session 1 **3:30 – 5:30**			**Atlantic Ballroom I**
	P1	H. Ohtani	Scientific Visualization Of Fusion Plasma And Plasma Physics By Virtual Reality System
	P2	M. Shoucri	Ion Acceleration And Plasma Jet Formation In The Interaction Of A Circularly Polarized Laser Beam Normally Incident On An Overdense Plasma: A Vlasov Code Simulation
	P3	M. Koodathingal	Ion Bubble Assisted Laser Wakefield Acceleration Of Electrons In A Preformed Non Uniform Plasma Channel
	P4	A. Sharma	Self-Thomson Backscattering Of Laser From Thin Plasma Target
	P5	U. Verma	Laser Focusing And Multiple Ionization Of Argon In A Hydrogen Plasma Channel Created By A Pre-Pulse
	P6	A. Korzhimanov	Lmis - A Fully Parallel Fourier-Based Multi-Dimensional Pic Code For Laser-Plasma Interaction Simulations
	P7	S. Brunner	Implementation Of Landau-Type Collision Operators In Eulerian-Based Vlasov Codes
	P8	J. Banks	High-Order Eulerian-Based Vlasov Simulation For Lpi In 1 Plus 1 And 2 Plus 2 -Dimensions
	P9	H. Ruhl	Numerical Simulation Of Cascading In Super-Intense Laser Fields
	P10	T. Tueckmantel	Self-modulated proton driver PWFA simulations using the new H-VLPL hybrid code
	P11	W. Tang	Simulation And Development Of A New Microwave Plasma Chemical Vapor Deposition Reactor For Diamond Films Deposition
	P12	J. Jenista	On The Influence Of Radiative Transfer Method In Computer Simulation Of Hybrid-Stabilized Electric Arc
	P13	A. Benmoussa	Study Of Gas Heating In A Xenon Glow Discharge

	P14	T. Yagisawa	Numerical Study Of Atmospheric Pressure Microplasma Under A Neutral Gas Dynamics
	P15	H. W. Lee	Global Modeling Of Low Temperature Atmospheric Pressure Plasmas Operated In Humid Air
	P16	Ivan Ganachev	Self-Consistent Simulation Of Local Electron Plasma Resonance In Non-Magnetized Low-Temperature Microwave Surface-Wave Plasma
	P17	C. Galitzine	Simulation Of The Interaction Between Two Rarefied Ionized Jets Using A Hybrid Method
	P18	A. Joy	Kolmogorov Flows In Strongly Coupled Plasmas - A Molecular Dynamics Study
	P19	P. Moroz	2d And 3d Computational Model Of Plasma-Surface Interactions
	P20	M. Hopkins	Ingredients For 3d Vacuum Arc Discharge Simulation
	P21	S. K. Kang	Physical Relation Between Number Of Particle Per Cell And Debye Number In Particle-In-Cell Simulations
	P22	S. Kumar	Numerical Study Of Nonlinear Interaction Between Kinetic Alfven Waves And Magnetosonic Waves In Plasma
	P23	M. Redi	Initial MHD Simulations Of Accretion Disk With Zeus Code
	P24	X. Cheng	Gyrokinetic Particle Simulation Of Spectral Cascade And Collisionless Dissipation In Kinetic Alfven Wave Turbulence
	P25	M. Matsumoto	Modification Of Electromagnetic Hybrid Particle-In-Cell Plasma Simulation Model For Robustness Improvement
	P26	A. Bonomo	High Temperature Transport And Thermodynamic Properties Of Equilibrium Mars Atmosphere
	P27	P. Porazik	Gyrokinetic Particle Simulation Of Drift-Compressional Modes In Dipole Geometry
	P28	L. W. Lin	GPU Accelerated Reduced MHD Simulations Of Coronal Loops
	P29	P. Damiano	A 2-D Hybrid MHD-Kinetic Electron Model For The Study Of Electron Acceleration In Alfven Waves
	P30	L. Sironi	Acceleration Of Particles At The Termination Shock Of A Relativistic Striped Wind
	P31	M. Ahmadi	The Investigation Of Magnetic Field Effect On The Ignition Conditions In Cylindrical Direct Driven Targets
	P32	L. Gholamzadeh	Simulation Of 3d-Deposition Energy With Wobbling Beam Illumination In Directly Driven Heavy Ion Fusion
	P33	L. Zakharov	Reference Magnetic Coordinates (Rmc) For Adaptive Grid Simulations Of Toroidal Plasma
	P34	S. Hudson	Nonlinearly Perturbed MHD Equilibria, With Or Without Magnetic Islands
	P35	W. Deng	Gyrokinetic Particle Simulations Of Reversed Shear Alfven Eigenmode In Diii-D Tokamak
	P36	H. Zhang	Nonlinear Frequency Chirping Of Beta-Induced Alfven Eigenmode
	P37	S. Satake	Simulation Studies On Neoclassical Viscosity In 3-Dimensional Magnetic Configurations
	P38	H. Sugama	Simulation Of Zonal Flow Evolution Based On A Collisionless Kinetic-Fluid Closure Model
	P39	S. Brunner	Collisional Simulations With The Global Gyrokinetic Delta-F Particle-In-Cell Code Orb5
	P40	J. Seebacher	Numerical Modelling of the Thermal Force Effect in Fluid and Kinetic Plasma Transport Codes
	P41	S. Murakami	Integrated Simulation Of Icrf Heating By Taskwm And Gnet

Wednesday, September 7, 2011		
After Dinner Talk		**Atlantic Ballroom IV**
7:45 – 8:30	G. Bhanot	We are all Africans: Decoding recent human migration history from mutations

Thursday, September 8, 2011	
Oral Session 4 – Chair: W. M. Tang	**Atlantic Ballroom II:** Special Presentation
8:00 – 8:25	

Thursday, September 8, 2011		
Oral Session 5A – Chair: B. Scott		**Atlantic Ballroom II:** **PIC Simulations for Magnetic Fusion Plasmas**
8:30 – 9:00	I. Holod	Global Gyrokinetic Simulations of Electromagnetic Instabilities in Tokamak Plasmas
9:00 – 9:30	R. Kleiber	Application of an enhanced control-variate scheme for particle-in-cell simulations with and without collisions
9:30 – 10:00	H. Naitou	Global MHD simulation by the gyrokinetic PIC code
		Break

Thursday, September 8, 2011		
Oral Session 5B – Chair: S. Brunner		**Atlantic Ballroom III:** **Novel Algorithms**
8:30 – 9:00	D. E. Newman	Time parallelization of plasma turbulence simulations by application of the Parareal algorithm
9:00 – 9:30	G. Vahala	Unitary Qubit Lattice Simulations of Multiscale Phenomena in 2D and 3D Quantum Turbulence
9:30 – 10:00	M. Bettencourt	Particle-Particle Particle-Mesh Computations Without Self Force
		Break

Thursday, September 8, 2011		
Oral Session 6A – Chair: E. Startsev		**Atlantic Ballroom II:** **General PIC simulations and applications**
10:30 – 11:00	J.-L. Vay	Novel Simulation Methods in the Particle-In-Cell Framework Warp
11:00 – 11:30	V. K. Decyk	Particle-in-Cell Simulations on Modern Computing Platforms
11:30 – 12:00	L. Chacon	An Energy- and Charge-conserving, Implicit, Electrostatic Particle-in-Cell Algorithm
12:00 – 12:30	G. C. Murphy	The effect of electrostatic fields on filament formation in counterstreaming plasma beams: Particle-In-Cell Simulations
12:30		*Lunch*

Thursday, September 8, 2011		
Oral Session 6B – Chair: M. Hopkins		**Atlantic Ballroom III:** **Low Temperature Plasmas**
10:30 – 11:00	J. K. Lee	Particle-in-Cell Simulation of Low-Temperature Atmospheric Pressure Plasmas for Biomedical Applications
11:00 – 11:30	S. Hamaguchi	Ionization-front propagation in nano-second pulsed plasmas near atmospheric pressure: analyses by particle-in-cell (PIC) simulation
11:30 – 12:00	F. Rogier	Numerical modeling of flow control by plasma actuators
12:00 – 12:30	Y. Sakiyama	Fluid Modeling of Low Temperature Atmospheric Pressure Plasmas: What can and cannot be done with Commercial Software
12:30		*Lunch*

Thursday, September 8, 2011			
Poster Session 2 2:00 – 4:00			**Atlantic Ballroom I:**
	P1	E. Startsev	Finite-beta Simulation of Microinstabilities
	P2	Z. Wang	Gyrokinetic Particle Simulation of Alfven Eigenmodes with Zonal Fields
	P3	S. Galkin	Adaptive meshless free-boundary non-linear simulation of tokamak plasma disruptions with DSC
	P4	M. Nunami	Gyrokinetic flux-tube code for comparison with experiment in non-axisymmetric systems and application to LHD discharge
	P5	A. Reiman	Status of the PIES 3D Equilibrium Code
	P6	W. W. Lee	Generalized Weight-Based Particle-in-Cell Simulation Schemes for Tokamak Plasmas
	P7	J. Cummings	Study of ELM Perturbation Effects on Divertor Heat Loads using Tightly Coupled Kinetic-MHD Simulations
	P8	J. Peterson	Advanced Numerical Methods for the Steady-State Plasma Transport Problem
	P9	A. Kritz	ITER SCENARIO MODELING
	P10	B. Lyons	Numerical calculation of neoclassical electron distribution function in an axisymmetric torus
	P11	J. Lang	Nonlinear Simulation of Multiple Energetic Particle Driven Alfven Eigenmodes with source and sink
	P12	C. Kim	Phase Space Analysis of Hybrid Kinetic-MHD Simulations
	P13	W. Lowrie	MULTI-BLOCK DEVELOPMENT AND APPLICATION TO A SHEAR FLOW Z-PINCH KINK MODE STABILIZATION
	P14	E. Belli	Full Linearized Fokker-Planck Collisions in Neoclassical and Gyrokinetic Transport Simulations
	P15	A. Richardson	Variable time step symplectic integrators for PIC applications
	P16	C. Fichtl	The Kinetic Theory Molecular Dynamics Method
	P17	A. Ratnani	ISOGEOMETRIC ANALYSIS IN PLASMA PHYSICS AND ELECTROMAGNETISM

	P18	G. L. Delzanno	Mesh adaptation and Monge-Kantorovich optmization
	P19	L. Gargate	Hybrid codes: numerical properties and applications to astrophysical shock scenarios
	P20	M. Murillo	Plasma simulation through a PIC conservative new method
	P21	T. Matsui	Dynamic Domain Decomposition for 3D PIC simulation with Adaptive Mesh Refinement
	P22	N. Reddy	Non-Iterative Numerical Integration Method for Singular Perturbation Problems Exhibiting Internal and Twin Boundary Layers
	P23	S. Usami	Multi-Hierarchy Simulation Model for Magnetic Reconnection Studies - Dynamical Conversion of Algorithm
	P24	L. J. Hook	Quasi Monte Carlo simulation of fast ion thermalization
	P25	I. Meyerov	Three-dimensional Particle-In-Cell plasma simulation on heterogeneous computing systems
	P26	D. Barnes	Low-noise, time-implicit PIC methods
	P27	G. Coppa	Simulation of the electron dynamics in non-ideal Penning traps
	P28	T-H. Watanabe	Recent extensions of a gyrokinetic Vlasov simulation code for helical plasmas
	P29	J. Baumgaertel	Improved algorithms for the GS2 code and application to gyrokinetic studies in the NCSX and W7-X Stellarators
	P30	M. McCourt	Scalable preconditioners for coupled plasma and neutral boundary transport simulations
	P31	S. Avdeev	wGUI: A Web-Based Graphical User Interface for High-Performance Computing
	P32	P. Grabowski	Width Spreading and Tests of Wave Packet Molecular Dynamics
	P33	A. Greenwood	Non-linear material modeling in ICEPIC
	P34	E. Camporeale	CPIC: a curvilinear Particle-In-Cell code for plasma-material interaction studies
	P35	S. Dettrick	GPU Acceleration of a Monte Carlo Neutral Beam Injection Code using Thrust
	P36	S. Farley	BOUT: Performance Characterization and Recent Advances in Design
	P37	G. Hammett	Positivity Preservation and Advection Algorithm Tests for Edge Plasma Turbulence
	P38	X. Yuan	Application of PDSLin to the magnetic reconnection problem
	P39	R. Rochford	Domain cloning techniques using MPI OpenMp hybridisation in a particle in cell code simulating the plasma distribution around pulsars using DYMPHNA3D
	P40	S. Ethier	Optimizing Gyrokinetic PIC Codes for Extreme Scale Computing

Friday, September 9, 2011		
Oral Session 7A – Chair: V. Decyk		**Atlantic Ballroom II:** **GPU-based PIC Simulations**
8:00 – 8:30	C. Ren	Particle-in-cell simulations with charge-conserving current deposition on graphic processing units
8:30 – 9:00	M. Bussmann	PIConGPU - A scalable implementation of the Particle-in-Cell Algorithm for GPU Clusters
9:00 – 9:30	K. Germaschewski	Dynamic load-balancing and GPU computing with the particle-in-cell code PSC
		Break

Friday, September 9, 2011		
Oral Session 7B – Chair: R. Samtaney		**Atlantic Ballroom III:** **Vlasov Simulations and Applications**
8:00 – 8:30	E. Sonnendrucker	Semi-Lagrangian Vlasov Solvers
8:30 – 9:00	Y. Idomura	Momentum transport in full-f gyrokinetic simulations
9:00 – 9:30	V. Grandgirard	Gyrokinetic global full-f flux-driven simulations
		Break

Friday, September 9, 2011		
Oral Session 8A – Chair: G. Hammett		**Atlantic Ballroom III:** **Magnetic Fusion Simulations**
10:00 – 10:30	B. Scott	Total-f Fully Nonlinear Electromagnetic Gyrokinetic Computation
10:30 – 11:00	M. V. Umansky	Plasma turbulence simulations and experimental validation on the linear device LAPD
11:00 – 11:30	S. Jardin	Multiple timescale calculations of sawteeth and other global macrosc opic dynamics of tokamak plasmas
11:30 – 12:00	T. G. Jenkins	ECCD-induced tearing mode stabilization in coupled IPS/NIMROD/GENRAY HPC simulations
12:00 – 12:30	J. Cheng	A Second-order accurate semi-implicit delta f method for kinetic MHD simulation
		Adjourn

Friday, September 9, 2011		
Oral Session 8B – Chair: T. Watanabe		**Atlantic Ballroom II:** **Numerical Methods for Plasma Simulations**
10:00 – 10:30	M.S. Rosin	Efficient Hybrid Methods for the Simulation of Plasmas with Coulomb Collisions
10:30 – 11:00	R. Samtaney	Numerical Aspects of Drift Kinetic Plasma Turbulence: Ill-posedness, Regularization and Apriori Estimates of Sub-grid-scale Terms
11:00 – 11:30	J. Finn	An Arbitrary Curvilinear Coordinate Particle-in-Cell Method
11:30 – 12:00	W. Arter	Ensuring Accurate Fieldline-Body Intersection
12:00 – 12:30	D. R. Reynolds	A Fully Implicit Newton-Krylov-Schwarz Method for Tokamak MHD: Jacobian Construction and Preconditioner Formulation
		Adjourn