

ICAP'09 AGENDA (updated 9/01/2009)

SUNDAY AUG 30, 2009, 3:00-6:00PM – Registration [LOBBY TERRACE]

MONDAY AUG 31, 2009, 8:00-8:45 – Registration [LOBBY TERRACE]

LOCATION: PEACOCK COURT

MONDAY AUG 31, 2009

8:45-9:00 Welcome and Announcements

9:00-10:30 Computational Challenges for Future Projects I (plenary) [3x30min]

Martin Dohlus, DESY, "Computational Challenges for the European XFEL"

Hiroyuki Takeda, RIKEN, "RIBF project status and the computational needs"

Simone Di Mitri, Elettra/Trieste, "Design and simulation challenges for the FERMI@Elettra project"

10:30-10:45 Q&A

10:45-11:45 Computational Challenges for Future Projects II (plenary) [2x30min]

Yuri Alexahin, FNAL, "Computational challenges for neutrino factories and muon colliders"

TBD

11:45-1:30 Lunch

1:30-3:35 Beam Dynamics I [5x25min]

Torsten Limberg, DESY, "State of the art in start-to-end simulations for large accelerators"

Dan Abell, Tech-X, "Computation of high order maps for rf cavities from surface data"

Chad Mitchell, Univ. Maryland, "Calculation of realistic charged-particle transfer maps"

Robert Warnock, SLAC, "Construction of Large-Period Symplectic Maps by Interpolative Methods"

Martin Berz, MSU: "New Developments on DA, TPSA, and Taylor Models for Maps, PDEs and Rigorous Global Optimization"

3:35-3:45 Q&A

3:45-5:25 Beam Dynamics II [4x25min]

Yves Ineichen, PSI/ETHZ, "A fast parallel Poisson solver on irregular domains applied to beam dynamic simulations"

Jin Xu, ANL, "Highly scalable numerical methods for simulation of space charge dominated beams"

Gisela Poeplau, U. Rostock, "An efficient 3D space charge routine with self-adaptive discretization"

Fanglei Lin, BNL, "Overview of the computational approaches to spin studies"

5:25-6:00 Q&A

6:00 Adjourn

LOCATION: ROOM OF THE DONS

1:30-3:35 Magnetic & electromagnetic modeling and design I [5x25min]

Natsuki Okuda, KEK, "Impedance calculation"

Thomas Lau, TEMF on " State of the art in numerical wake field computations"

Andreas Kabel, SLAC, "Short-range wakefields in the FEM formalism"

Misun Min , ANL, "Spectral element discontinuous Galerkin simulations with moving window for wakefield calculations"

John D'Angelo, AFRL/RDHE, "Computational Electromagnetic Methods for the Design Process"

3:35-3:45 Q&A

3:45-5:50 Magnetic & electromagnetic modeling and design II [5x25min]

Carl Bauer, U CO, "A 2nd order 3D EM algorithm for simulating discontinuous anisotropic dielectrics on the Yee mesh"

Sascha Schnepf, GSCE/TU Darmstadt, "Applying an hp-Adaptive Discontinuous Galerkin Method for Beam Dynamics Simulations"

Prof. Hideki Kawaguchi, Muroran Inst. of Tech., "Portable high performance computing for microwave simulation by FDTD/FIT machines"

Markus Clemens, Helmut Schmidt Univ, "Progress in Simulation of EM Fields with Higher Order DGFEM on Unstructured Grids"

Shashikant Manikonda, ANL, "High-Order DA methods for PDEs including rigorous error verification"

5:50-6:00 Q&A

6:00 Adjourn

TUESDAY SEPT 1, 2009

**PEACOCK COURT**

**8:00-8:10 Announcements**

**8:10-9:50 Code Verification & Validation and Prediction I (plenary) [4x25min]**

Jeffrey Holmes, ORNL, "Space-charge simulation: Instabilities, benchmarking, and application to SNS"  
Lars Groening, GSI, "Comparison of different simulation codes with UNILAC measurements for high beam currents"  
Travis Austin, Tech-X, "Validation of parallel FDTD simulations using measured frequencies of the A15 accel cavity"  
Kai Tian, JLAB, "Benchmark of Different Codes for the High Frequency EM Calculation of a Spherical Cavity"

**9:50-10:00 Q&A**

**10:00-11:20 Code Verification & Validation and Prediction II [4x25min]**

Yuantao Ding, SLAC, Comparison of simulation and measurements at LCLS  
Vladimir Komilov, GSI, "Simulation studies & code validation for head-tail instab w/ space charge in FAIR synchrotrons"  
Eric Stern, FNAL, "Challenges and results of modeling coherent multi-bunch b-b effects @ Tevatron & other colliders"  
David Higdon, LANL, "Inference for a Proton Accelerator Using Convolution Models"

**11:20-11:45 Q&A**

**11:45-1:30 Lunch**

**1:30-3:35 Computational advances for light sources and FELs I [5x25min]**

Sven Reiche, PSI, "Advances in FEL modeling"  
Ji Qiang, LBNL, "Multi-billion particle simulation of beam dynamics in electron linacs for x-ray FELs"  
Riccardo Bartolini, Diamond, "Progress in understanding and control of nonlinearities at the Diamond light source"  
Johan Bengtsson, BNL, "Design and simulation of ultralow emittance light sources"  
TBD

**3:35-3:45 Q&A**

**3:45-5:50 Combined systems: Beams, Plasmas, and EM Fields I [5x25min]**

Samuel Martins, IPFN/IST Lisbon "OSIRIS simulations of laser wakefield accelerators: boosted frame, particle injection methods, and radiation"  
J.-L. Vay, LBNL, "Novel methods for simulating relativistic systems using an optimal boosted frame"  
C. Geddes, LBNL, "Multi GeV and injection-controlled laser-plasma accelerator simulations"  
D. Grote, LLNL, "Methods for efficiently simulating ion beam neutralization via plasmas, and plasma injection"  
D. Smithe, Tech-X, "Charge-conserving ADI for FDTD-PIC Maxwell-Lorentz simulations"

**5:50-6:00 Q&A**

**6:00 Adjourn**

**ROOM OF THE DONS**

**1:30-3:35 Magnetic & electromagnetic modeling III [5x25min]**

Rich Lee, SLAC, "Towards extreme-scale electromagnetic modeling"  
Lukas Haenichen, TEMF, "Comparing Time and Frequency domain methods for Coupling Impedance calculation"  
Paolo Ferracin, LBNL, "Modeling techniques for design and analysis of superconducting accelerator magnets"  
Stephan Russenschuck, CERN, "Computational challenges in magnet design"  
Stephan Koch, TEMF, "Large-scale 3D magnetoquasistatic simulations of accelerator components"

**3:35-3:45 Q&A**

**3:45-5:50 Magnetic & electromagnetic modeling IV [5x25min]**

Ichitaro Yamazaki, LBNL, "A hybrid method for solving large and highly-indefinite linear systems of equations"  
Xiaojuan Luo, RPI, "High-order Mesh Adaptation Techniques to Improve ComPASS Simulations"  
Bill Henshaw, LLNL, "A high-order accurate parallel solver for the time domain Maxwell's equations on overlapping grids"  
Erik Boman, SNL, "Zoltan - A Parallel Software Tool to Enable Peta-scale Simulations through Partitioning, Load Balancing and Matrix Ordering"  
G. Schussman, SLAC, "Seeing the Invisible - Visualizing Radio-Frequency Electromagnetic Fields on Unstructured Meshes"

**5:50-6:00 Q&A**

**6:00 Adjourn**

WEDNESDAY SEPT 2, 2009

**PEACOCK COURT**

**8:00-8:10 Announcements**

**8:10-9:50 Trends in High Performance Computing I (plenary) [4x25min]**

John Shalf, LBNL: HPC trends in hardware

Kathy Yelick, LBNL: HPC trends in software and programming

Shane Canon, LBNL: Trends in I/O and filesystems

Kwan-Liu Ma, UC Davis, "Next-generation visualization technology for computational science"

**9:50-10:00 Q&A**

**10:00-11:40 Trends in High Performance Computing II (plenary) [4x25min]**

Martin Schauer, CST, "Hard- and software-based acceleration techniques for field computation"

Peter Messmer, Tech-X, "Hardware acceleration for computational electromagnetics"

Viktor Decyk, UCLA, GPU-based PIC simulation

Svetlana Shasharina, Tech-X, "VizSchema - A standard approach for visualization of computational accelerator physics data"

**11:40-11:45 Q&A**

**11:45-1:30 Lunch**

**1:30-3:10 Status of Beam Dynamics Codes I [4x25min]**

A. Adelmann, "The Object Oriented Parallel Accelerator Library (OPAL), Design, Implementation & Application

Michael Borland, ANL, "Recent progress on the ELEGANT code"

Giovanni Rumolo, CERN, "Recent upgrades of the HEADTAIL simulation code"

Frank Schmidt, CERN, "Update on MAD-X and future plans"

**3:10-3:30 Q&A**

**3:30-5:10**

**Computational advances for light sources and FELs II [4x25min]**

Dmitre Dimitrov, Tech-X, "Simulations of diamond amplifiers for photocathodes"

Arno Candel, SLAC, "High-Fidelity Injector Modeling with Parallel Finite Element 3D PIC Code Pic3P"

Mark Hess, U. Indiana, "Dispersion Free Modeling of Electromagnetic Space-Charge Effects in Rf Photoinjectors"

Micha Dehler, PSI, Beam dynamics in the low energy part of the low emittance gun

**5:10-5:30 Q&A**

**5:30 Adjourn**

**ROOM OF THE DONS**

**1:30-2:45 On-line Modeling; Computational Technologies for Accelerator Applications [4x25min]**

Andrei Shishlo, ORNL, "The XAL control room high level application infrastructure"

Nanbor Wang, Tech-X, "Next-generation communication middleware for high-level accelerator applications"

Kevin Brown, BNL, "Improvement plans for the RHIC/AGS on-line model environments"

**2:45-3:30 Q&A**

**3:30-5:35**

**Beam Phenomena I: Beam-Beam Interactions [5x25min]**

K. Ohmi, KEK, "B-B simulations for very high current collisions & very small beta/emitt collisions in B factories"

Alexander Valishev, FNAL, "LARP beam-beam simulations for the LHC and beam-beam compensation"

Tatiana Pieloni, EPFL/Lausanne, "A parallel code for self-consistent beam-beam simulations for beams with a large number of bunches"

Yuan Zhang, IHEP, "Recent advances in simulation of beam-beam effects"

Yuhong Zhang, JLab, "Application of BeamBeam3D to ELIC design"

**5:35 Adjourn**

THURSDAY SEPT 3, 2009

**PEACOCK COURT**

**8:00-8:10 Announcements**

**8:10-9:50 Non-traditional accelerators, structures, and beam configurations [4x25min]**

C. Johnstone, FNAL, "Reviving FFAG accelerators and the computational challenges associated with their design"  
Hiromi Okamoto, Hiroshima Univ, "Modeling of ultra-cold and crystalline ion beams"  
Gregory Werner, Univ. Colorado, "Wake fields in photonic crystal structures"  
Alex Friedman, LLNL, "Ion induction linac beam dynamics and optimization with applications to NDCX-II"

**9:50-10:00 Q&A**

**10:00-11:20 Beam Phenomena II: CSR, Instabilities, Scattering [4x25min]**

Gabriele Bassi, Cockroft Institute, "Self-fields of a bunch on a planar orbit: A search for improved methods"  
Demin Zhou, KEK, "Simulation of microwave instability in LER of KEKB and SuperKEKB"  
Christopher Mayes, Cornell U., "CSR Simulations in ERL Light Sources"  
Aimin Xiao, ANL, "Study of Beam Scattering Effects for a Proposed APS ERL Upgrade"

**11:40-11:45 Q&A**

**11:45-1:30 Lunch**

**1:30-3:10 Beam Phenomena III: Electron-cloud effects, injection/extraction [4x25min]**

Yu Dong Liu, IHEP, "Recent advances in electron-cloud simulation"  
John DeFord, AWR/STAAR, "Improved Secondary Emission Models for Multipacting Calculations in the Analyst Code"  
Timofey Gorlov, ORNL, Laser stripping with the Python ORBIT code  
Frederick Jones, TRIUMF, Using Geant4-based tools to simulate a proton extraction and transfer line

**3:10-3:30 Q&A**

**3:30-5:10 Case Studies III [4x25min]**

Nikolay Solyak, FNAL, "ILC and Project-X wakefield and beam dynamics simulations"  
Gianluigi Clemente, GSI, End to end simulations of the GSI linear accelerator facility  
Herbert De Gerssem, Univ. Leuven, "Transient 3D FE simulations of the SIS100 magnet"  
Wolfgang Ackermann, TEMF/TU Darmstadt, "Transverse coupler kicks in TESLA cavities"

**5:10-5:30 Q&A**

**5:30 Adjourn**

**SIX CONTINENTS AND ADJOINING ROOMS (2<sup>ND</sup> FLOOR)**

6:30-9:30 POSTER SESSION (INCLUDING DINNER)

**ROOM OF THE DONS**

**8:10-9:50 Vlasov, Vlasov/Maxwell, Maxwell/Lorentz [4x25min]**

Sylvain Franke, TEMF, TU Darmstadt, "A fast and universal Vlasov solver for beam dynamics simulations"  
Martin Campos Pinto, U. Strassbourg, "Consistent coupling in FEM-PIC codes for Vlasov-Maxwell Simulation"  
Marcus Wittberger (PSI/ETHZ), "Self-Consistent 3D Finite Element Vlasov-Maxwell Solver with Particles"  
Daniel White, LLNL, "An unstructured grid finite element method using D and H fields for improved representation of charged particle transport"

**9:50-10:00 Q&A**

**10:00-11:20 Case Studies I [4x25min]**

Masanori Ikegami, KEK, "Simulation and commissioning of the JPARC linac using the IMPACT code"  
Liling Xiao, SLAC, "800MHz Crab Cavity Design for the LHC Upgrade"  
J. Amundson, FNAL, "self-consistent simulations of slow resonant extraction under strong space-charge forces for the mu-to-e exp"  
T. Zhang, CIAE, "Physics problem study for a 100 MeV, 500 microAmp H- beam compact cyclotron"

**11:40-11:45 Q&A**

**11:45-1:30 Lunch**

**1:30-3:10 Case Studies II [4x25min]**

Hyung Kim, FNAL, "Development of a fast Vlasov Solver and Simulations of b-b and beam-wire interactions in RHIC"  
Ben Pine, RAL, "Space Charge Simulations for ISIS"  
Yunhai Cai, SLAC, "Potential-well distortion, microwave instab, and effects w/ colliding beams at KEKB"  
Chengkun Huang, UCLA, "Quasi-static simulations using QuickPIC of PWFAs and LWFAs"

**3:10-3:30 Q&A**

**3:30-5:35 Case Studies IV [5x25min]**

Monika Balk, CST, Simulation of electron guns for high power klystrons  
B. Erdelyi, ANL/NIU, "COSY extensions for beam-material interactions including application to FRIB"  
Lixin Ge, SLAC, "Simulation of multipacting and dark current in the CLIC structure and muon cooling cavity using Track3P"  
Shou Yan Xu, IHEP, "The study of space charge effects in the CSNS/RCS"  
Chet Nieter, Tech-X, "Multipactoring simulations of 56 MHz cavities for the RHIC upgrade"

**5:35 Adjourn**

**FRIDAY SEPT 4, 2009**

**PEACOCK COURT**

**8:00-8:10 Announcements**

**8:10-9:50 Optimization (plenary) [4x25min]**

Brahim Mustapha, ANL, "Optimization algorithms for accelerator physics problems"

Lingyun Yang, LBNL, "Global optimization of the magnetic lattice using multi-objective genetic algorithms"

Kyoko Makino, MSU, "Massively parallel rigorous global optimization using Taylor models in COSY"

Michael Borland, ANL, "Application of Direct Methods of Optimizing Storage Ring Dynamic and Momentum Apertures"

**9:50-10:00 Q&A**

**10:00-11:45 Closing session [3x35min]**

Wes Bethel, LBNL, "Foghorns, Lighthouses and the Circuitous, Hazard-laden Path towards Extreme Scale Visual Data Analysis"

Salman Habib, LANL, "Hybrid Petacomputing Meets Cosmology: The Roadrunner Universe Project"

Horst Simon, LBNL, "What Supercomputers Still Can't Do"

**11:45-12:00 Closing announcements**

**12:00 Adjourn**