# Sunday 3/22

**07:30-08:30 Breakfast [Copper Conference Center]**

## 08:00-10:05 Session 2A: Preconditioning for Multiphysics Problems I. Bighorn B

Bighorn B

08:00 A Scalable Approximate Inverse Block Preconditioner for an Incompressible Magnetohydrodynamics Model Problem
**Chen Greif**

08:25 Block preconditoning strategy for reduced magnetohydrodynamic (RMHD) equations
**Thomas Manteuffel** Ben Southworth

08:50 Scalable implicit, adaptive MFEM-based solvers for reduced resistive MHD
**Qi Tang** Luis Chacon, Tzanio Kolev, John Shadid, Xian-Zhu Tang

09:15 An element-based preconditioner for mixed finite element problems
**Tyrone Rees** Michael Wathen

09:40 Scalable Block Preconditioning of Implicit / IMEX FE Continuum Plasma Physics Models
**John Shadid** Michael Crockatt, Roger Pawlowski, Sidafa Conde, Ari Rappaport, Edward Phillips, Eric Cyr, Sean Miller, Paul Lin, Sibu Mabuza

## 08:00-10:05 Session 2B: Krylov Methods. Bighorn C/1

Bighorn C/1

08:00 On the Convergence Rate of Variants of the Conjugate Gradient Algorithm in Finite Precision Arithmetic
**Anne Greenbaum** Kelly Liu, Tyler Chen

08:25 Sharp 2-norm Error Bounds for the Conjugate Gradient Method and LSQR
**Eric Hallman**

08:50 Singular Systems along with Eigenvalues and Singular Values
**Ron Morgan**

09:15 Delayed Re-Orthogonalization to Achieve One-Synch Classical Gram-Schmidt Applied to GMRES and Krylov-Schur Algorithms
**Daniel Bielich** Julien Langou, Stephen Thomas, Katarzyna Swirydowicz

09:40 A single-pole rational Krylov subspace method for approximating Markov functions of matrices
**Shengjie Xu**

## 08:00-10:05 Session 2C: PDE-constrained Optimization. Bighorn C/2

Bighorn C/2

08:00 An Approximation Scheme For Distributionally Robust Nonlinear PDE-Constrained Optimization
**Michael Ulbrich** Johannes Milz

08:25 An ADMM-based time domain decomposition approach for PDE constrained optimization
**Stefan Ulbrich**

08:50 Algebraic Multigrid Preconditioning for PDE-constrained Optimization
**Andrew Barker** Andrei Draganescu

09:15 Fractional Optimal Control Problems with State Constraints: Algorithm and Analysis
**Deepanshu Verma**

09:40 —

**10:05- 10:25 Coffee \& Tea Service**

**10:25- 12:30 Session 3A: Preconditioning for Multiphysics Problems II. Bighorn B**
Bighorn B

10:25 Preconditioning a Fully Implicit Gyrokinetic Electromagnetic Particle-in-Cell Method
**Benjamin Sturdevant** Seung-Hoe Ku, Amil Sharma, Choong-Seock Chang, Luis Chacon, Mark Adams

10:50 A coupled thermal radiative transfer and kinetic plasma solver
**Hans Hammer** William Taitano, Hyeongkae Park, Luis Chacón

11:15 A moment-accelerated iterative implicit solver for the multi-species 1D-2V Vlasov-Fokker-Planck – Ampère kinetic equation
**Steven Anderson** William Taitano, Luis Chacón, Andrei Simakov

11:40 A solution strategy for fluid-structure interaction using the unified continuum formulation, quasi-direct coupling, and nested block preconditioning
**Ju Liu** Alison Marsden

12:05 Simulating Multi-Species Compressible Flow with a Fully-Implicit All-Speed Flow Solver
**Brian Weston** Robert Nourgaliev, Matthew McClelland

**10:25- 12:30 Session 3B: Iterative Methods and Preconditioning. Bighorn C/1**
Bighorn C/1

10:25 Band-Toeplitz preconditioners for nonsymmetric ill-conditioned Toeplitz systems
**Sean Hon** Stefano Serra-Capizzano, Andy Wathen

10:50 Efficient low-order refined solvers for high-order matrix-free continuous and discontinuous Galerkin methods
**Will Pazner**

11:15 Robust and Efficient Multilevel-ILU Preconditioning of Newton-GMRES with Applications to Navier-Stokes Equations
**Qiao Chen**

11:40 A new implicit Eulerian solver for semiconductor models
**Victor DeCaria**

12:05 —

**10:25- 12:30 Session 3C: Inverse Problems and Regularization. Bighorn C/2**
Bighorn C/2

10:25 Iterative Image Reconstruction and Segmentation Using Mesh Adaptation
**James Nagy** Leonardo Locatelli, Simona Perotto

10:50 An Inner-Outer Iterative Method for Edge Preservation in Image Restoration and Reconstruction
**Silvia Gazzola** Misha Kilmer, James Nagy

11:15 A Hybrid Approach for Image Reconstruction in Electrical Impedance Tomography
**Sanwar Ahmad** Taufiquar Khan

11:40 CALIBRATING SENSING DRIFT IN TOMOGRAPHIC INVERSION
**Xiang Huang** Stefan Wild, Zichao Di

12:05 A Multilevel Hyperbolic Neural Network for Image Segmentation.
**Keegan Lensink** Eldad Haber, Bas Peters

## 16:30-18:35 Session 4A: Preconditioning for Multiphysics Problems III. Bighorn B

Bighorn B

16:30 Monolithic Multigrid for a Stabilized Discretization of the Poroelastic Equations
**Peter Ohm** James Adler, Xiaozhe Hu, Scott MacLachlan, Yunhui He

16:55 Robust Preconditioners for Mixed-dimensional Models of Flow in Fractured Porous Media
**Wietse Boon** Ana Budisa, Xiaozhe Hu

17:20 A New Solver for Coupling Maxwell's Equations to Transmission Lines
**Edward Phillips** Duncan McGregor, Tim Pointon

17:45 An iterative particle-in-cell scheme for the hybrid plasma model using physics-based preconditioning
**Adam Stanier** Luis Chacon, Guangye Chen

18:10 On the robust discretization and fast solver for the H(curl) and H(div) convection-diffusion problems
**Shuonan Wu** Jinchao Xu

## 16:30-18:35 Session 4B: AMG for Nonsymmetric Problems. Bighorn C/1

Bighorn C/1

16:30 Algebraic Multigrid for Highly Convective Flow Simulations
**Ray Tuminaro** Luc Berger-Vergiat, Chris Siefert, Dimitri Mavriplis

16:55 Nonlinear and Linear Agglomeration Multigrid Methods for Reynolds-averaged Navier-Stokes Problems in Aerodynamics
**Dimitri Mavriplis**

17:20 Incompressible Navier-Stokes with Two-Stage Gauss-Seidel Smoothers for FGMRES-AMG
**Stephen Thomas** Kasia Swirydowicz, Shreyas Ananthan, Michael Sprague

17:45 A parallel multigrid technique for nonsymmetric elliptic systems with application to variable-density flows
**Mahdi Esmaily** Lluis Jofre, Ali Mani, Gianluca Iaccarino

18:10 Discretization of the Multifluid Plasma Model using IMEX and Mixed Continuous/Discontinuous FEM
**Sean Miller** Eric Cyr, Edward Phillips, Roger Pawlowski, Kris Beckwith, Matt Bettencourt, Keith Cartwright, Sidney Shields

## 16:30-18:35 Session 4C: Nonlinear Solvers and Coupling Methods in Climate Modeling. Bighorn C/2

Bighorn C/2

16:30 Initialization of the thermo-mechanical state of an ice sheet model using PDE-constrained optimization
**Mauro Perego** Raymond Tuminaro

16:55 A scalable semi-implicit barotropic mode solver for the MPAS-Ocean
**Hyun Kang** Katherine Evans, Philip Jones, Mark Petersen, Andrew Salinger, Ray Tuminaro

17:20 Meshless Remap of Native Fields for Earth System Models via Generalized Moving Least Squares
**Paul Kuberry** Pavel Bochev, Kara Peterson

17:45 Interface Flux Recovery Coupling Method for the Ocean-Atmosphere System
**Chad Sockwell** Kara Peterson, Paul Kuberry, Pavel Bochev

18:10 Overcoming Gibbs Phenomenon in Data Remap and Convection-Dominant PDEs using WLS-ENO Techniques
**Yipeng Li** Qiao Chen, Xuebin Wang, Xiangmin Jiao