Sunday 3/22

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

08:00-10:05 **Session 2A: Preconditioning for Multiphysics Problems I.**
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

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

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

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 multispecies 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

10:25 Band-Toeplitz preconditioners for non-symmetric 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

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

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

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 non-symmetric elliptic systems with application to variable-density flows
Mahdi Esmaily Lluis Jofre, Ali Mani, Gianluca Iaccarino

18:10 Discretization of the Multi-fluid 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

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