Workshop I: Multiphysics, Multiscale, and Coupled Problems in Subsurface Physics

Monday April 3, 2017

8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*

8:50–9:00 *Welcome and Opening Remarks*

9:00–9:50 **Fredrik Saaf** (Shell)
Integrated Asset Modelling: An Industry Perspective

10:00–10:15 *Break*

10:15–11:05 **Thomas Hou** (California Institute of Technology)
Multiscale Model Reduction and Sparse Operator Compression for Multiscale Problems

11:15–11:30 *Break*

11:30–12:20 **Houman Owhadi** (California Institute of Technology)
Universal Scalable Robust Solvers from Computational Information Games and fast eigenspace adapted Multiresolution Analysis

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Stephane Zaleski** (Université de Paris VI (Pierre et Marie Curie))
The simulation of droplets, bubbles and interfaces

3:10–4:00 **Shahriar Afkhami** (New Jersey Institute of Technology)
From mesoscopic to macroscopic computations of dynamic contact lines

4:10–4:20 *Break*

4:20–5:10 **Birol Dindoruk** (Shell)
TBA

5:20–7:00 *Poster Session & Reception (Hosted by IPAM)*

Tuesday April 4, 2017

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Yalchin Efendiev** (Texas A&M University - College Station)
Flow-based upscaling and generalized multiscale finite element methods for problems in heterogeneous media

10:00–10:15 *Break*

10:15–11:05 **Patrick Farrell** (University of Oxford)
Computational Issues in Oil Field Applications

11:15–11:30 *Break*

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11:30–12:20 **Konstantin Lipnikov** (Los Alamos National Laboratory)
Physics-preserving discretizations for subsurface flows

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Olav Møyner** (SINTEF Applied Mathematics)
A multiscale restriction-smoothed basis method for high contrast porous media represented on unstructured grids

3:00–3:15 *Break*

3:15–4:05 **Ivan Yotov** (University of Pittsburgh)
Biot-Stokes modeling of flow in fractured poroelastic media

4:15–5:05 **Andro Mikelic** (Université Claude-Bernard (Lyon I))
Phase-field modeling of a fluid-driven fracture in a poroelastic medium

Wednesday April 5, 2017

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Brice Lecampion** (École Polytechnique Fédérale de Lausanne (EPFL))
Hydraulic Fractures: Modeling and realities

10:00–10:15 *Break*

10:15–11:05 **Joel Ita** (Shell)
Optimizing coupled mechanics-fluid flow simulation by simulating different physics at different scales in space and time

11:15–11:30 *Break*

11:30–12:20 **Mary Wheeler** (University of Texas at Austin)
Methodologies and Robust Algorithms for Subsurface Simulators

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Brad Mallison** (Chevron)
Flow diagnostics, multi-phase flow and upscaling for discrete fracture-matrix simulations

3:05–3:55 **Lou Durlofsky** (Stanford University)
Upscaling of Compositional Models for Single-Porosity and Discrete-Fracture-Matrix Systems

4:05–4:15 *Break*

4:15–5:05 **Sanghyun Lee** (University of Texas at Austin)
Pressurized and Fluid filled fracture propagation in porous media using phase field approach

Thursday April 6, 2017

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Peter Sammon** (Computer Modelling Group Ltd (CMG))
Some Aspects of Coupling Complex Wells and Networks to a Reservoir Simulator

10:00–10:15 *Break*

10:15–11:05 **Hui Cao** (Total)
Production system modeling from wells to surface facilities, and its coupling with reservoir

11:15–11:30 *Break*

11:30–12:20 **Yu Zhang** (ConocoPhillips)
From Migration to Inversion: Theory and Algorithms behind Geophysical Depth Imaging

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Eric Chung** (Chinese University of Hong Kong)
Adaptive multiscale model reduction using generalized multiscale finite element methods

3:00–3:10 *Break*

3:10–4:00 **Seong Lee** (Chevron)
Hybrid discretization of multi-phase fluids in porous media in the presence of viscous, gravitational and capillary forces

4:10–4:20 *Break*

4:20–5:10 **Jinchao Xu** (Pennsylvania State University)
On the Lack of Accuracy of Semi-explicit Schemes for Phase-Field Simulations

Friday April 7, 2017

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Knut--Andreas Lie** (SINTEF)
Fully implicit higher-order schemes applied to polymer flooding

10:00–10:15 *Break*

10:15–11:05 **Arthur Moncorge** (Total)
Efficient Sequential Implicit Scheme for Compositional Flow Simulation

11:15–11:30 *Break*

11:30–12:20 **Rami Younis** (University of Tulsa)
Adaptive solution methods for implicit and monolithic simulation