2018 SIAM Louisiana-Texas Section Conference
Baton Rouge, Louisiana
October 5–7, 2018

Schedule of talks on Saturday, October 6, 2018

07:30–12:00	**Registration**

08:00–10:00	**Numerical geometric PDE, Session 1, Room: Lockett 239**
	Organizers: Alan Demlow, Shawn Walker
08:00–08:25	Shawn Walker: A mixed finite element method for 4th order elliptic problems on surfaces
08:30–08:55	Alan Demlow: A posteriori error estimates for the Laplace-Beltrami operator on parametric surfaces
09:00–09:25	Justin Owen: FEM approximation of eigenvalue problems on surfaces
09:30–09:55	Vladimir Yushutin: A finite element method for surface Navier-Stokes flows

08:00–10:00	**Nonlinear modeling of disease dynamics, Room: Lockett 276**
	Organizers: Kun Gou, Md Rafiul Islam, Tamer Oraby
08:00–08:25	Tamer Oraby: Modeling an outbreak of the Middle East respiratory syndrome in a hospital
08:30–08:55	Rafiul Islam: Mathematical modeling of an infectious disease and identification of its dominant transmission pathways
09:00–09:25	Mondal Hasan Zahid: Ebola: Impact of hospital's admission policy in an overwhelmed scenario
09:30–09:55	Kun Gou: Nonlinear tubular organ deformation analysis for airway swelling

08:00–10:00	**Image processing algorithms: progress and challenges, Room: Lockett 277**
	Organizer: Hyoungsu Baek
08:00–08:25	Hyoungsu Baek: Anisotropic angle smoothing algorithm for 3D dip estimation
08:30–08:55	Xinming Wu: Automatic fault interpretation with optimal surface voting
09:00–09:25	Houzhu Zhang: A robust optical flow algorithm for computing wave propagation direction
09:30–09:55	Sergey Fomel: Seismic data matching

08:00–10:00	**Mathematical and computational aspects of fracture, Session 1, Room: Lockett 284**
	Organizers: Blaise Bourdin, Robert Lipton
08:00–08:25	Egor Dontsov: Hydraulic fracture regimes and their applications
08:30–08:55	Greg Rodin: Smooth and rough growing three-dimensional cracks
09:00–09:25	Yuri Antipov: Subsonic penetration of a thin rigid body into an elastic medium with crack-like cavities ahead and behind the body
09:30–09:55	Prashant Jha: Convergence results for finite element and finite difference approximation of nonlocal fracture models

08:00–10:00	**Imaging and inverse problems, Session 1, Room: Lockett 285**
	Organizer: Tan Bui-Thanh
08:00–08:25	Kui Ren:
08:30–08:55	Hejun Zhu:
09:00–09:25	Siddhant Wahal:
09:30–09:55	Alexander Mamonov:

08:00–10:00	**Switched systems in controls, Room: Lockett 241**
	Organizer: Oleg Makarenkov
08:00–08:25	Michael Malisoff: Stability and robustness analysis for switched systems with time-varying delays
08:30–08:55	Guoxiang Gu: State consensus for discrete-time multi-agent systems over time-varying graphs
09:00–09:25	Kaveh Fathian: Formation control in multi-robot systems
09:30–09:55	Oleg Makarenkov: Convex analysis approach to stabilize spring systems with switching topology

08:00–10:00	**Nonlinear conservation laws and applications, Session 1, Room: Lockett 243**
	Organizers: Kun Zhao, Yanni Zeng
08:00–08:25	Charis Tsikkou: On similarity flows for the compressible Euler system
08:30–08:55	Tien Khai Nguyen: Recent results on Kolmogorov entropy compactness estimates for conservation laws
09:00–09:25	Changhui Tan: Global regularity for Burgers equation with density dependent fractional dissipation
09:30–09:55	Siran Li: Compensated compactness, (isometric) immersions and elasticity

10:00–10:30	**Coffeee break, Room: Math Department Lounge in 3rd floor of Lockett Hall**

10:30–11:30	**Plenary lecture, Room: 100 Dodson Hall**
	Suncica Canic: Mathematical Methods for Next Generation Stent Design

11:30–01:00	**Lunch, Room: Math Department Lounge in 3rd floor of Lockett Hall**

01:00–03:00	**Numerical geometric PDE, Session 2, Room: Lockett 239**
	Organizers: Alan Demlow, Shawn Walker
01:00–01:25	Ari Stern: Hybrid methods for geometric PDEs
01:30–01:55	Martin Licht: Geometric transformations of finite element methods
02:00–02:25	Johnny Guzman: Exact smoothed piecewise polynomial sequences on Alfeld splits
02:30–02:55	Juan Pablo Borthagaray: Q-tensor model for nematic liquid crystals with variable degree of orientation

01:00–03:00	**Mathematical modeling in ecology and epidemiology, Session 1, Room: Lockett 276**
	Organizers: Hayriye Gulbudak, Mac Hyman
01:00–01:25	Scott A McKinley:
01:30–01:55	Cameron Browne:
02:00–02:25	Xiang-Sheng Wang:
02:30–02:55	Aadrita Nandi: Effects of host infectivity and susceptibility on disease emergence in stochastic multigroup models with applications toemerging and re-emerging infectious diseases

01:00–03:00	**Recent advances in modeling, simulation and stability studies in EOR and geosciences, Room: Lockett 277**
	Organizer: Prabir Daripa
01:00–01:25	Prabir Daripa: Mathematical and computational challenges for multi-phase porous media flows in EOR
01:30–01:55	Sourav Dutta: A study on dispersion in multicomponent porous media flow and transport processes
02:00–02:25	Craig Gin: Linear stability of multi-layer radial porous media and Hele-Shaw flows
02:30–02:55	Mayank Tyagi: Pore-scale analysis of interface instabilities and determination of effective permeability using lattice Boltzmann method (LBM)

01:00–03:00	**Spectral theory of differential operators, Session 1, Room: Lockett 284**
	Organizer: Stephen Shipman
01:00–01:25	Gregory Berkolaiko: Nodal count distribution of graph eigenfunctions
01:30–01:55	Minh Kha: On Liouville-Riemann-Roch theorems
02:00–02:25	Wen Liu: Quotient of a quantum graph by a representation of its symmetry group
02:30–02:55	Stephen Fulling: Spectral analysis in renormalization

01:00–03:00	**Imaging and inverse problems, Session 2, Room: Lockett 285**
	Organizer: Tan Bui-Thanh
01:00–01:25	Sergey Fomel:
01:30–01:55	Brad Marvin:
02:00–02:25	Wei Li:
02:30–02:55	Tan Bui-Thanh:

01:00–03:00	**Models and methods in biology and physics: from the stochastic to the continuum, Session 1, Room: Lockett 241**
	Organizer: William Ott
01:00–01:25	William Ott:
01:30–01:55	James Winkle:
02:00–02:25	Ilya Timofeyev: Stochastic parametrization of subgrid scales in the finite-volume discretization of the shallow-water equations
02:30–02:55	Duc Truong:

01:00–03:00	**Nonlinear partial differential equations and applications, Session 1, Room: Lockett 243**
	Organizers: Karthik Adimurthi, Phuc Cong Nguyen
01:00–01:25	Jinping Zhuge: Periodic homogenization of quasilinear elliptic equations
01:30–01:55	Ralph Saxton: Delta Shock Formation in the $N \times N$ Keyfitz and Kranzer System
02:00–02:25	Ariel Barton: Boundary value problems for higher order elliptic differential equations
02:30–02:55	John Villavert: Qualitative analysis of equations associated to sharp Hardy-Sobolev and Caffarelli-Kohn-Nirenberg inequalities

03:00–3:30	**Coffeee break, Room: Math Department Lounge in 3rd floor of Lockett Hall**

03:30–05:30	**Computational methods for waves in complex media, Session 1, Room: Lockett 239**
	Organizers: Wei Cai, Tom Hagstrom
03:30–03:55	We Cai: Fast kernel matrix compression techniques for wave scattering in inhomogeneuous media
04:00–04:25	Adrianna Gillman: A fast direct solver for scattering problems in quasi-periodic layered medium Helmholtz problems
04:30–04:55	Alex Mamonov: Multi-scale S-fraction reduced-order models for massive wavefield simulations
05:00–05:25	Bo Wang: Efficient numerical simulation of spherical cloaking in time domain

03:30–05:30	**Modeling, analysis, and computation in mathematical biology, Room: Lockett 276**
	Organizer: Xiang-Sheng Wang
03:30–03:55	Jun Liu: Optimal control of a continuously size-structured model for the growth and treatment of metastatic cancer
04:00–04:25	Masud Rana: Spatially heterogeneous producer-grazer model subject to stoichiometric constraints
04:30–04:55	Jaeyoun Oh: An adaptive MFS for the Laplace equation in 2D and 3D
05:00–05:25	Zhifu Xie: A diffusive prey-predator model with Alee effect in predator

03:30–05:30	**Image processing algorithms: progress and challenges, Room: Lockett 277**
	Organizer: Hyoungsu Baek
03:30–03:55	Hyoungsu Baek: Computational challenges for generating balanced images
04:00–04:25	Xinming Wu: Seismic volumetric unfaulting and flattening
04:30–04:55	TBA.
05:00–05:25	TBA.

03:30–05:30	**High-order accurate numerical methods for multi-physics problems,** **Room: Lockett 284**
	Organizer: Longfei Li
03:30–03:55	Yue Yu: Error estimates for immersogeometric methods with application to bioprosthetic heart valves
04:00–04:25	Dan Serino: A stable added-mass partitioned (AMP) algorithm for elastic solids and incompressible flows
04:30–04:55	Andre Gianesini Odu: High-Order accurate conservative finite difference methods for Vlasov equations in 2D+2V
05:00–05:25	Annalisa Quaini: A Higher-order DG/ALE partitioned approach to solving fluid-structure interaction problems

03:30–05:30	**Numerical approximation of fractional differential equations, Session 1,** **Room: Lockett 285**
	Organizers: Andrea Bonito, Robert Lipton
03:30–03:55	Joe Pasciak: Rational approximations to functions involving fractional powers of elliptic operators
04:00–04:25	Abner Salgado: Finite element approximation of an obstacle problem for a class of integro-differential operators
04:30–04:55	Xiaochuan Tian: Consistent traction boundary conditions for nonlocal models
05:00–05:25	Zhiping Mao: Fractional phase field crystal modelling

03:30–05:30	**Numerical PDE/ODE and HPC applications, Session 1, Room: Lockett 241**
	Organizer: Don Liu
03:30–03:55	Don Liu: Numerical studies of complex two phase flow and convective heat transfer
04:00–04:25	Sheng Xu: Some recent development of the immersed interface method for flow simulation
04:30–04:55	Xiaoliang Wan: Dynamic-solver-consistent minimum action method for Navier-Stokes equations
05:00–05:25	Steele Russell: Exploiting parallelisms in grid world navigation task to reduce training latency via high performance computing techniques

03:30–05:30	**Nonlinear partial differential equations and applications, Session 2,** **Room: Lockett 243**
	Organizers: Karthik Adimurthi, Phuc Cong Nguyen
03:30–03:55	Tadele Mengesha: A Potential space estimate for solutions of system of coupled nonlocal equations
04:00–04:25	Dat Cao: Quasilinear elliptic equations with weights
04:30–04:55	Jiuyi Zhu: Quantitative uniqueness of partial differential equations
05:00–05:25	Karthik Adimurthi: A unified approach to parabolic quasilinear equations

05:40–07:00	**Poster session and snacks, Location: 2nd floor of Lockett Hall**

Schedule of talks on Sunday, October 7, 2018

07:30–12:00	**Registration**

08:00–10:00	**Computational methods for waves in complex media, Session 2,**
	Room: Lockett 239
	Organizers: Wei Cai, Tom Hagstrom
08:00–08:25	Jesse Chan: Bernstein-Bezier weight-adjusted discontinuous Galerkin methods for wave propagation in heterogeneous media
08:30–08:55	Minh Binh Tran: Iterative solvers for discontinuous Galerkin methods
09:00–09:25	Jingmei Qiu: High order semi-implicit IMEX WENO scheme for the Euler system with all-Mach number
09:30–09:55	John Lagrone: Microdynamics in regularized Brinkman flow

08:00–10:00	**Mathematical modeling in ecology and epidemiology, Session 2,**
	Room: Lockett 276
	Organizers: Hayriye Gulbudak, Mac Hyman
08:00–08:25	Hayriye Gulbudak: Two-strain multi-scale model structured by dynamic host antibody level
08:30–08:55	Mac Hyman:
09:00–09:25	Li Guan:
09:30–09:55	Swati Patel:

08:00–10:00	**Mathematics in oil and gas exploration and production, Session 1,**
	Room: Lockett 277
	Organizers: Ipsita Gupta, Monika Valjak
08:00–08:25	Monika Valjak and Francisco Correa Mora: Geostatistic modeling applications in deepwater Gulf of Mexico reservoirs
08:30–08:55	Yanfen Zhang and Hemant Phale: Ensemble-based methods for history matching and production optimization
09:00–09:25	Hope Asala: Gas flow in non-Newtonian drilling fluids - A CFD approach
09:30–09:55	Andreas Michael: Orientation of hydraulic fracture initiation from horizontal wellbores: An analytical and numerical Study

08:00–10:00	**Mathematical and computational aspects of fracture, Session 2,**
	Room: Lockett 284
	Organizers: Blaise Bourdin, Robert Lipton
08:00–08:25	Xiaochuan Tian: Coupling methods of nonlocal and local models
08:30–08:55	Masoud Behzadinasab, John T. Foster: A peridynamics study of predicting ductile fracture in additively manufactured metal
09:00–09:25	Blaise Bourdin: Crack nucleation in variational phase-field models of fracture
09:30–09:55	James Scott: The Dirichlet Problem for a Nonlocal System of Equations Related to Peridynamics

08:00–10:00	**Numerical approximation of fractional differential equations, Session 2, Room: Lockett 285**
	Organizers: Andrea Bonito, Robert Lipton
08:00–08:25	Jie Shen: Log orthogonal functions and their applications to fractional PDEs
08:30–08:55	Peng Wei: Numerical approximation of time dependent advection fractional diffusion systems
09:00–09:25	Juan Pablo Borthagaray: Weighted Sobolev regularity and rate of approximation of the fractional obstacle problem
09:30–09:55	Harbir Antil: Sobolev spaces with non-Muckenhoupt weights, fractional elliptic operators, and applications

08:00–10:00	**Models and methods in biology and physics: from the stochastic to the continuum, Session 2, Room: Lockett 241**
	Organizer: William Ott
08:00–08:25	Swati Patel:
08:30–08:55	Bhargav Karamched: Boundary-driven emergent spatiotemporal order in growing microbial colonies
09:00–09:25	Mehdi Sadeghpour:
09:30–09:55	Xi Chen: Optimal sub-sampling in non-parametric estimation of effective stochastic dynamics from discrete time-series

08:00–10:00	**Nonlinear conservation laws and applications, Session 2, Room: Lockett 243**
	Organizers: Kun Zhao, Yanni Zeng
08:00–08:25	Yanni Zeng: Recent results for the logarithmic Keller-Segel-Fisher/KPP system
08:30–08:55	Geng Chen: BV existence or blowup for p-system?
09:00–09:25	Xukai Yan: (-1)-homogeneous solutions of stationary incompressible Navier-Stokes equations with singular rays
09:30–09:55	Tong Wu: A new approach for designing moving-water equilibria preserving schemes for the shallow water equations

10:00–10:30	**Coffeee break, Room: Math Department Lounge in 3rd floor of Lockett Hall**

10:30–11:30	**Plenary lecture, Room: 100 Dodson Hall**
	Todd Arbogast: Mixed Methods for Two-Phase Darcy-Stokes Mixtures of Partially Melted Materials with Regions of Zero Porosity

11:30–01:00	**Lunch, Room: Math Department Lounge in 3rd floor of Lockett Hall**

01:00–03:00	**Numerical geometric PDE, Session 3, Room: Lockett 239**
	Organizers: Alan Demlow, Shawn Walker
01:00–01:25	Andrea Bonito: Numerical methods for bilayer plate models
01:30–01:55	Maxim Olshanskii: A finite element method for PDEs in time-dependent domains
02:00–02:25	Harbir Antil: Optimal control of grain boundary motions
02:30–02:55	Wenbo Li: Pointwise error estimates for a two-scale method for the Monge-Ampère equation

01:00–03:00	**Mathematics in oil and gas exploration and production, Session 2, Room: Lockett 277**
	Organizers: Ipsita Gupta, Monika Valjak
01:00–01:25	Mayank Tyagi and Sultan Anbar: Statistical sstimation and machine learning of proppant and gravel packs petrophysical properties from pore scale simulations
01:30–01:55	Wenbo Zhu: Cognitive machine monitoring: industrial monitoring systems using machine learning and deep learning approaches
02:00–02:25	Xuan Liao and Mayank Tyagi: Data driven modeling and predictive analytics for waterflooding operations using reservoir simulations
02:30–02:55	Jorge Chebeir: Artificial neural networks for unconventional reservoirs production and supply chain optimization

01:00–03:00	**Spectral theory of differential operators, Session 2, Room: Lockett 284**
	Organizer: Stephen Shipman
01:00–01:25	Vu Hoang: Quantitative bounds versus weakly coupled states for generalized Schrödinger Operators
01:30–01:55	Isaac Michael: Birman-Hardy-Rellich-type inequalities and refinements
02:00–02:25	Giles Auchmuty: Construction of orthogonal eigenfunction bases of Hilbert-Sobolev spaces
02:30–02:55	Robert Lipton: Analytic continuation of bilinear forms and spectra of divergence form operators for composite media.

01:00–03:00	**Numerical approximation of fractional differential equations, Session 3, Room: Lockett 285**
	Organizers: Andrea Bonito, Robert Lipton
01:00–01:25	Peng Wei: Numerical approximation of time dependent advection fractional diffusion systems
01:30–01:55	Abner Salgado: Sparse optimal control for fractional diffusion
02:00–02:25	Andrea Bonito:
02:30–02:55	Juan Pablo Borthagaray: Weighted Sobolev regularity and rate of approximation of the fractional obstacle problem

01:00–03:00	**Numerical PDE/ODE and HPC applications, Session 2, Room: Lockett 241**
	Organizer: Don Liu
01:00–01:25	Don Liu: Numerical studies of complex two phase flow and heat transfer
01:30–01:55	Sheng Xu: Some recent development of the immersed interface method for flow simulation
02:00–02:25	Xiaoliang Wang: Dynamic-solver-consistent minimum action method for Navier-Stokes equations
02:30–02:55	Ning (Michael) Zhang: Immersed boundary method in coastal hydraulic modeling