

At-A-Glance

SIAM Conference on **Analysis of Partial Differential Equations**



December 9–12, 2017
The Baltimore Convention Center
Baltimore, Maryland, USA



Society for Industrial and Applied Mathematics
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2017 SIAM Conference on Analysis of Partial Differential Equations At-A-Glance

Friday, December 8

4:00 PM - 8:00 PM

Registration
Charles Terrace-Level 300

6:00 PM - 8:00 PM

PP1 Welcome Reception and Poster Session
309/310 - Level 300



Saturday, December 9

7:30 AM - 3:30 PM

Registration
Charles Terrace-Level 300

8:30 AM - 10:30 AM

Concurrent Sessions

MS1 Conservation/Dissipation of Energy in Equations of Fluid Mechanics - Part I of II
314 - Level 300

MS2 Multi-species Kinetic and Fluid Models and Applications - Part I of II
315 - Level 300

MS3 Multiscale Analysis and Simulation of Heterogeneous Media - Part I of II
316 - Level 300

MS4 See Sunday 8:30 AM

MS5 Free Boundary Problems and Fluid Interfaces - Part I of II
317 - Level 300

MS6 Partial Differential Equations in Machine Learning and Data Science - Part I of II
318 - Level 300

MS7 PDE Models for Pattern Forming Systems
319 - Level 300

MS8 Recent results on Navier-Stokes and Related Physical Systems - Part I of II
320 - Level 300

MS9 Progress in Non-local Variational Problems - Part I of II
321 - Level 300

MS38 Multiphysics and Turbulence: Analysis and Simulation - Part I of II
322 - Level 300

CP1 Numerical Methods for Fluid Mechanics and Related Models
323 - Level 300

CP2 Equations from Fluid Mechanics and Related Models
324 - Level 300

10:30 AM - 10:50 AM

Coffee Break
309/310 - Level 300



Saturday, December 9

10:50 AM - 11:00 AM

Welcome Remarks
307/308 - Level 300

11:00 AM - 11:45 AM

IP1 Travel Time Tomography
Gunther Uhlmann, Hong Kong University of Science and Technology, Hong Kong and University of Washington, USA
307/308 - Level 300

11:45 AM - 12:30 PM

IP2 Dynamics of Contact Lines
Yan Guo, Brown University, USA
307/308 - Level 300

12:30 PM - 2:30 PM

Lunch Break
Attendees on their own

2:30 PM - 4:30 PM

Concurrent Sessions

MS10 Conservation/Dissipation of Energy in Equations of Fluid Mechanics - Part II of II
314 - Level 300

MS11 Multi-species Kinetic and Fluid Models and Applications - Part II of II
315 - Level 300

MS12 Multiscale Analysis and Simulation of Heterogeneous Media - Part II of II
316 - Level 300

MS13 See Sunday 2:30 PM

MS14 Free Boundary Problems and Fluid Interfaces - Part II of II
317 - Level 300

MS15 Partial Differential Equations in Machine Learning and Data Science - Part II of II
318 - Level 300

MS16 Waves and Patterns
319 - Level 300

MS17 Recent Results on Navier-Stokes and Related Physical Systems - Part II of II
320 - Level 300

MS18 Progress in Non-local Variational Problems - Part II of II
321 - Level 300

MS47 Multiphysics and Turbulence: Analysis and Simulation - Part II of II
322 - Level 300

CP3 Numerical Methods
323 - Level 300

CP4 Inverse Problems and Control
324 - Level 300

Sunday, December 10

8:00 AM - 3:30 PM

Registration
Charles Terrace-Level 300

8:30 AM - 10:30 AM

Concurrent Sessions

MS4 Analysis, Control and Inverse Theory of Flows, Material Structures, Acoustics, and Their Interactions - Part I of II
320 - Level 300

MS19 Recent Developments in Fluid Dynamics - Theory and Numerical Approximation - Part I of II
314 - Level 300

MS20 Mathematical Analysis in Incompressible Fluid Dynamics - Part I of II
315 - Level 300

MS21 On Higher Order Methods for Numerical Solution of PDE - Part I of II
316 - Level 300

MS22 Recent Developments in Modeling, Control, Theoretical and Numerical Analysis of Complex Systems with Dynamic Boundaries - Part I of II
322 - Level 300

MS23 Nonlinear PDEs in Fluid Mechanics - Part I of IV
317 - Level 300

MS24 Mean Field Games and Applications - Part I of II
318 - Level 300

MS25 Waves and Imaging Through Complex Media - Part I of II
319 - Level 300

MS26 See Monday 8:30 AM

MS27 Graph Laplacians, Spectral Graph Theory, and Applications - Part I of II
321 - Level 300

CP5 Numerical Methods for Reaction Diffusion Equations and Related Models
323 - Level 300

CP6 Parabolic, Elliptic Equations, and Related Models
324 - Level 300

10:30 AM - 10:55 AM

Coffee Break
309/310 - Level 300



10:55 AM - 11:00 AM

Announcements
307/308 - Level 300

2017 SIAM Conference on Analysis of Partial Differential Equations At-A-Glance

Sunday, December 10

11:00 AM - 11:45 AM

IP3 Eulerian and Lagrangian Solutions of the Continuity Equation

Gianluca Crippa, University of Basel, Switzerland

307/308 - Level 300

11:45 AM - 12:30 PM

IP4 Nonlinear Elliptic Equations with Fractional Diffusion

Xavier Cabré, ICREA and Universitat Politècnica de Catalunya, Spain

307/308 - Level 300

12:30 PM - 2:30 PM

Lunch Break

Attendees on their own

SIMA Editorial Board Meeting

325-Level 300

2:30 PM - 4:30 PM

Concurrent Sessions

MS13 Analysis, Control and Inverse Theory of Flows, Material Structures, Acoustics, and Their Interactions - Part II of II

320 - Level 300

MS28 Recent Developments in Fluid Dynamics - Theory and Numerical Approximation - Part II of II

314 - Level 300

MS29 Mathematical Analysis in Incompressible Fluid Dynamics - Part II of II

315 - Level 300

MS30 On Higher Order Methods for Numerical Solution of PDE - Part II of II

316 - Level 300

MS31 Recent Developments in Modeling, Control, Theoretical and Numerical Analysis of Complex Systems with Dynamic Boundaries - Part II of II

322 - Level 300

MS32 Nonlinear PDEs in Fluid Mechanics - Part II of IV

317 - Level 300

MS33 Mean Field Games and Applications - Part II of II

318 - Level 300

MS34 Waves and Imaging Through Complex Media - Part II of II

319 - Level 300

MS35 See Monday 3:15 PM

MS36 Graph Laplacians, Spectral Graph Theory, and Applications - Part II of II

321 - Level 300

CP7 Dispersive Equations

323 - Level 300

CP8 Stability and Instability

324 - Level 300

Monday, December 11

8:00 AM - 4:00 PM

Registration

Charles Terrace-Level 300

8:30 AM - 10:30 AM

Concurrent Sessions

MS26 Geometric Analysis and Analysis in Geometry - Part I of II

315 - Level 300

MS37 Regularity and Long-time Behavior of Fluid Flows - Part I of II

314 - Level 300

MS38 See Saturday 8:30 AM

MS39 Recent Developments in Numerical Methods for PDEs and Their Applications - Part I of II

316 - Level 300

MS40 Recent Advances in Conservation Laws and Transport Equations: Theory and Applications - Part I of II

322 - Level 300

MS41 Nonlinear PDEs in Fluid Mechanics - Part III of IV

317 - Level 300

MS42 Kinetic and Mean-field Models in Socio-economics and Life Sciences - Part I of II

318 - Level 300

MS43 Coupled Nonlinear PDEs, Solitons, and Nonlinear Dynamics - Part I of II

319 - Level 300

MS44 Recent Development of the Mathematical Theory in Complex Fluids - Part I of II

320 - Level 300

MS45 Analysis, Control, and Long-time Behavior of Fluid and Flow-Structure Models - Part I of II

321 - Level 300

CP9 Reaction Diffusion Systems and Pattern Formation

323 - Level 300

10:30 AM - 10:55 AM

Coffee Break

309/310 - Level 300

10:55 AM - 11:00 AM

Announcements

307/308 - Level 300

11:00 AM - 11:45 AM

IP5 Regularity Theory in Elliptic Free Boundary Problems

Daniela De Silva, Columbia University, USA

307/308 - Level 300

Monday, December 11

11:45 AM - 12:30 PM

IP6 Partial Differential Equations of Mixed Elliptic-Hyperbolic Type: From Mechanics to Geometry

Gui-Qiang Chen, University of Oxford, United Kingdom

307/308 - Level 300

12:30 PM - 2:00 PM

Lunch Break

Attendees on their own

2:00 PM - 2:45 PM

SP1 SIAG/Analysis of Partial Differential Equations Prize Lecture: Quantitative Stochastic Homogenization by Variational Methods

Scott Armstrong, Courant Institute of Mathematical Sciences, New York University, USA

307/308 - Level 300

2:45 PM - 3:15 PM

Coffee Break

309/310 - Level 300



3:15 PM - 5:15 PM

Concurrent Sessions

MS35 Geometric Analysis and Analysis in Geometry - Part II of II

315 - Level 300

MS46 Regularity and Long-time Behavior of Fluid Flows - Part II of II

314 - Level 300

MS47 See Saturday 2:30 PM

MS48 Recent Developments in Numerical Methods for PDEs and Their Applications - Part II of II

316 - Level 300

MS49 Recent Advances in Conservation Laws and Transport Equations: Theory and Applications - Part II of II

322 - Level 300

MS50 CANCELLED

MS51 Kinetic and Mean-field Models in Socio-economics and Life Sciences - Part II of II

318 - Level 300

MS52 Coupled Nonlinear PDEs, Solitons, and Nonlinear Dynamics - Part II of II

319 - Level 300

MS53 Recent Development of the Mathematical Theory in Complex Fluids - Part II of II

320 - Level 300

MS54 Analysis, Control, and Long-time Behavior of Fluid and Flow-Structure Models - Part II of II

321 - Level 300

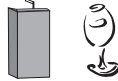
Monday, December 11

Tuesday, December 12

CP10 Boundary Condition Problems
323 - Level 300

5:15 PM - 5:30 PM
Intermission

5:30 PM - 6:15 PM
SIAG/APDE Business Meeting
307/308 - Level 300
Complimentary beer and wine will be served.



Tuesday, December 12

8:00 AM - 3:00 PM
Registration
Charles Terrace-Level 300

8:30 AM - 10:30 AM
Concurrent Sessions
MS55 Modeling and Analysis of Condensed Matter Systems - Part I of II
314 - Level 300
MS56 PDEs Arising from the Self-organization of Agents
315 - Level 300
MS57 Recent Development in Numerical Methods for Optics and Plasmonics - Part I of II
316 - Level 300
MS58 Singular Solutions of Parabolic and Elliptic Problems and their Applications
322 - Level 300
MS59 Nonlinear PDEs in Fluid Dynamics: Deterministic and Probabilistic Approaches - Part I of II
317 - Level 300
MS60 PDEs and SDEs for Materials Science - Part I of II
318 - Level 300
MS61 Waves and Patterns - Part I of II
319 - Level 300
MS62 Iterative Solutions for Variational Inclusions Problems in Banach Spaces
320 - Level 300
CP11 Equations from Fluid Mechanics
323 - Level 300

10:30 AM - 10:55 AM
Coffee Break
309/310 - Level 300



10:55 AM - 11:00 AM
Closing Remarks
307/308 - Level 300

11:00 AM - 11:45 AM

IP7 Small Scale Formation in Ideal Fluids
Alexander Sasha Kiselev, Duke University, USA
307/308 - Level 300

11:45 AM - 12:30 PM

IP8 Stability of Prandtl Boundary Layers
Emmanuel Grenier, Ecole Normale Supérieure de Lyon, France
307/308 - Level 300

12:30 PM - 2:30 PM





Lunch Break
Attendees on their own

2:30 PM - 4:30 PM

Concurrent Sessions

MS63 Modeling and Analysis of Condensed Matter Systems - Part II of II
314 - Level 300
MS64 Recent Development in Numerical Methods for Optics and Plasmonics - Part II of II
316 - Level 300
MS65 Fluid-Boundary Interactions
322 - Level 300
MS66 Nonlinear PDEs in Fluid Dynamics: Deterministic and Probabilistic Approaches - Part II of II
317 - Level 300
MS67 * PDEs and SDEs for Materials Science - Part II of II
318 - Level 300
MS68 Waves and Patterns - Part II of II
319 - Level 300

Key to abbreviations and symbols

CP	=	Contributed Presentation
IP	=	Invited Plenary Speaker
SP	=	Special Lecture
MS	=	Minisymposium
	=	Business Meeting
	=	Coffee Break
	=	Poster Session
	=	Refreshments Served
*	=	Extended Session

SIAM Activity Group on Partial Differential Equations(SIAG/APDE)

www.siam.org/activity/pde

A GREAT WAY TO GET INVOLVED!

Collaborate and interact with mathematicians and applied scientists whose work involves partial differential equations.

ACTIVITIES INCLUDE:

- Special Sessions at SIAM meetings
- Biennial conference
- SIAG/APDE Prize
- SIAG/APDE Website

BENEFITS OF SIAG/APDE MEMBERSHIP:

- Listing in the SIAG's online membership directory
- Additional \$15 discount on registration at the at the SIAM Conference on the Analysis of Partial Differential Equations
- Electronic communications about recent developments in your specialty
- Electronic newsletter
- Eligibility for candidacy for SIAG/APDE office
- Participation in the selection of SIAG/APDE officers

ELIGIBILITY:

- Be a current SIAM member.

COST:

- \$15 per year
- Student members can join 2 activity groups for free!

SIAM Conference on Analysis of Partial Differential Equations

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2017-18 SIAG/APDE OFFICERS

Chair:	Eitan Tadmor, University of Maryland, College Park
Vice Chair:	Milton da Costa Lopes Filho, Cidade Universitaria
Program Director:	Alexis Vasseur, University of Texas
Secretary:	Alina Chertock, NC State University

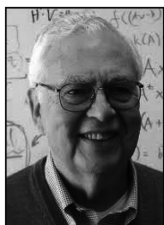
TO JOIN:

SIAG/APDE: my.siam.org/forms/join_siag.htm
SIAM: www.siam.org/joinsiam

Gene Golub
g2s3 2018
SIAM Summer School

June 17-30, 2018
Breckenridge, Colorado, USA

Inverse Problems: Systematic Integration of Data with Models under Uncertainty



The ninth Gene Golub SIAM Summer School will take place at the Double Tree by Hilton in Breckenridge, Colorado, USA.

The summer school aims to introduce graduate students to the mathematical and computational aspects of inverse problems, particularly modern developments that emphasize the quantification of uncertainty in the inverse solution within the framework of Bayesian inference. The target audience is PhD and appropriate MS students in mathematics and related fields such as computer science, statistics, engineering, and science.

The central question we address is: How do we learn from data through the lens of models? The summer school will feature an integrated and coherent presentation that begins with ill-posedness and regularization, develops the ideas and tools for deterministic inversion via nonlinear least squares optimization, and elaborates formulations and solution methods for the modern Bayesian perspective, building on several of the deterministic tools. The concepts introduced in the morning lectures will be reinforced and put into practice in afternoon hands-on laboratory sessions using open-source software (hIPPYlib, MUQ) implementing state-of-the-art deterministic and Bayesian inversion methods. Students will work together on projects that will be presented on the last day of the school.

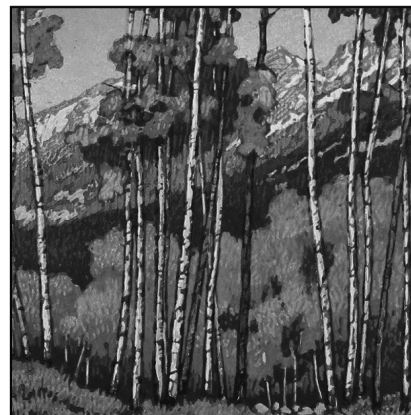
The summer school is being organized by Omar Ghattas (The University of Texas at Austin), Youssef Marzouk (MIT), Matthew Parno (US Army Corps of Engineers), Noemi Petra (University of California, Merced), Georg Stadler (New York University), and Umberto Villa (The University of Texas at Austin).

Applicants selected to participate pay no registration fee. Funding for local accommodations and meal expenses will be available for all participants.

Application deadline: February 1, 2018

As information becomes available on how to apply, it will be posted at:

<http://www.siam.org/students/g2s3/>



Aspen Stand, woodcut by Leon Loughridge

*Sponsored by SIAM through an endowment from the estate of Gene Golub.
For more information about prior summer schools and Professor Gene Golub go to
<http://www.siam.org/students/g2s3/>*

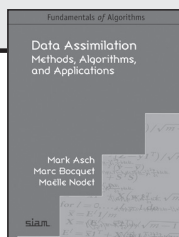
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SIAM Titles of Interest to PD17 Attendees

These and other SIAM books are available at the conference

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Data Assimilation: Methods, Algorithms, and Applications

Mark Asch, Marc Bocquet, Maëlle Nodet

Fundamentals of Algorithms 11

A comprehensive guide that is accessible to nonexperts. Readers will find numerous examples and diverse applications from a broad range of domains, including geophysics and geophysical flows, environmental acoustics, and medical imaging.

2017 / xviii + 306 pages / Softcover / 978-1-611974-53-9

List \$84.00 / Member \$58.80 / Attendee \$67.20 / FA11

Formulation and Numerical Solution of Quantum Control Problems

Alfio Borzi, Gabriele Ciaramella, and Martin Sprengel

Computational Science and Engineering 16

This self-contained book covers the formulation, analysis, and numerical solution of quantum control problems and bridges scientific computing, optimal control and exact controllability, optimization with differential models, and the sciences and engineering that require quantum control methods.

2017 / x + 390 pages / Hardcover / 978-1-611974-83-6

List \$99.00 / Member \$69.30 / Attendee \$79.20 / CS16

Inverse Scattering Theory and Transmission Eigenvalues

Fioralba Cakoni, David Colton, Houssein Haddar

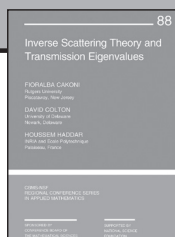
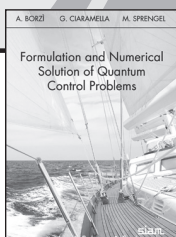
CBMS-NSF Regional Conference Series in Applied Mathematics 88

The authors begin with a basic introduction to the theory, then proceed to more-recent developments, including a detailed discussion of the transmission eigenvalue problem. They present the new generalized linear sampling method in addition to the well-known linear sampling and factorization methods and in order to achieve clarification of presentation, focus on the inverse scattering problem for scalar homogeneous media.

2016 / x + 193 pages / Softcover / 978-1-611974-45-4

List \$59.00 / Member \$41.30 / Attendee \$47.20 / CB88

ALL PRICES ARE IN US DOLLARS.



Analysis of Hydrodynamic Models

Peter Constantin

CBMS-NSF Regional Conference Series in Applied Mathematics 90

A concise treatment of a number of partial differential equations of hydrodynamic origin, including the incompressible Euler equations, SQG, Boussinesq, incompressible porous medium, and Oldroyd-B. The author's concise, unified approach brings readers up to date on current open problems.

2017 / x + 62 pages / Softcover / 978-1-611974-79-9

List \$39.00 / Member \$27.30 / Attendee \$31.20 / CB90

A Taste of Inverse Problems: Basic Theory and Examples

Martin Hanke

This book presents the main achievements that have emerged in regularization theory over the past 50 years, focusing on linear ill-posed problems and the development of methods that can be applied to them. It rigorously discusses state-of-the-art inverse problems theory, focusing on numerically relevant aspects and omitting subordinate generalizations.

2017 / viii + 162 pages / Softcover / 978-1-611974-93-5

List \$59.00 / Member \$41.30 / Attendee \$47.20 / OT153

Foundations of Applied Mathematics, Volume 1: Mathematical Analysis

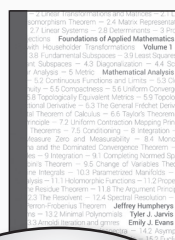
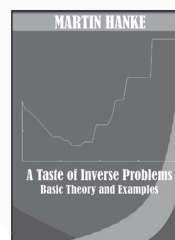
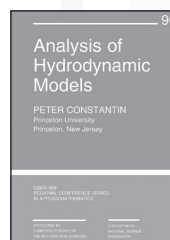
Jeffrey Humpherys, Tyler J. Jarvis, and Emily J. Evans

"Humpherys, Jarvis, and their collaborators are in the process of achieving something extraordinary: the creation of an entire curriculum of rigorous graduate-level applied mathematics with a four-volume series of first-rate books to support it."

—Lloyd N. Trefethen, University of Oxford

2017 / xx + 689 pages / Hardcover / 978-1-611974-89-8

List \$89.00 / Member \$62.30 / Attendee \$71.20 / OT152



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10/17

Baltimore Convention Center Floor Plan

