9 Research Talks

1. **Invited** (15 minutes)(Upcoming): "A proposal to model non-uniform mixing of polymers in flows of shear-thinning polymers in porous media during enhanced oil recovery by polymer flooding", in Minisymposium titled "Mathematical and numerical methods for multi-scale multi-physics, nonlinear coupled processes", Talk given on May 19th, InterPore 2025, 17th Annual Meeting, Albuqurque, New Mexico (19-22 May 2025). Minisymposium organizers: Jakub Both, Omar Duran, Nicolás Barnafi, Son-Young Yi, and Sanghyun Lee.
2. Contributed (13 minutes): "Some interesting but counterintuitive results in multi-interface dynamics in radial Hele-Shaw flows with time-dependent injection rate", Session "Statistical and Nonlinear Physics II", Talk on Thursday, March 20, 12:54 PM-1:06 PM, 2025 Joint March and April Meeting:APS Global Physics Summit 2025. Anaheim, California. (March 16-21, 2025).
3. Contributed (13 minutes): "Modeling non-uniform mixing of polymers in flows of shear-thinning polymers and surfactants in porous media", Session on "Porous Media Flows: Immiscible Displacements", 77th Annual Meeting of the Division of Fluid Dynamics, APS, Salt Lake City, UT. November 24-26, 2024. Talk given on Nov. 24th, 2024 from 9:05 am - 9:18 am.
4. **Invited** (1 hour): "FFTRR based algorithms: fast computation of solutions of elliptic equations in real and complex plane, numerical analysis, applications, and much more", First year graduate student seminar, Department of Mathematics, Texas A&M University, (Oct. 10, 2024).
5. Contributed (15 minutes): "A numerical study of the surfactant-polymer flooding using a recently developed FEM-MMOC based code", 2024 Texas A&M Conference on Energy, College Station, Texas, Sept. 11-13, 2024. Talk given on Sept 12th, 2024 from 4:15 pm - 4:30 pm, Co-authors: CS undergraduate student Carlos Acosta and Chemical Engineering undergraduate student Bhargav Akula Ramesh Kumar. Talk given by Bhargav Akula Ramesh Kumar. He also received a Best Oral Presentation Award certificate.
6. Departmental Seminar (50 minutes) "Fundamental interfacial problems arising in applied mathematical context", Applied Mathematics Seminar, Mathematics Department, TAMU, College Station, August 28, 11:00 - 11:50 PM, 2024.
7. **Invited** (60 minutes): "Modeling flows of shear-thinning polymers and surfactants in porous media", Applied Math Seminar in Chemical Engineering Department, University of Calgary, Calgary, 07/22/2024.
8. **Invited** (30 minutes): "Some aspects of modeling chemical enhanced oil recovery and fracturing instability in complex fluids", The Banff International Research Station for Mathematical Innovation and Discovery (BIRS) Workshop, The Banff Centre in Alberta, Canada (July 14-19, 2024). Talk on Thursday, July 18, 11:00-11:30 AM, 2024.
9. **Contributed** (15 minutes): "Fast iterative methods for variable coefficient diffusion equations on a disk", SIAM 2024 Annual Meeting, Spokane, WA. (July 8-12, 2024). Talk given by my graduate student Try Nguyen Tran during 9:20-9:35 am on Monday, July 8 during morning session CP2, 8:00-9:35 am.

10. **Invited** (30 minutes): "Mathematical and computational challenges in chemical enhanced oil recovery", Seventh Annual Texas A&M Research Computing Symposium 2024, TAMU ILCB Building, College Station, Texas, (20-24 May 2024). Talk given in room ILCB 224 during 10:00-10:30 AM, on May 23, 2024.
11. **Invited** (15 minutes): "Modeling of Dispersive Shear Thinning Polymer-Surfactant Flooding", in Minisymposium titled "Mathematical and numerical methods for multiscale multi-physics, nonlinear coupled processes", Talk given on May 13th, InterPore 2024, 16th Annual Meeting, Qingdao, China (13-16 May 2024). Minisymposium organizers: Jakub Both, Eric Chung, Ben Mansour Dia, Cunqi Jia, Nadja Ray, and Peng Xu. Online Presentation.
"Video of my talk"
12. Contributed (13 minutes): "Modeling non-uniform mixing of polymer in Enhanced Oil Recovery by polymer flooding", Session "RR03: V:DFD II", Talk on Friday, March 8, 12:18 PM-12:30 PM, 2024 Annual March Meeting of American Physical Society, Minneapolis, Minnesota. (March 3-8, 2024).
13. **Invited** (one hour) "Introduction to modeling of population dynamics", Applied Mathematics Undergraduate Seminar (AMUSE), Department of Mathematics, Texas A&M University, (Feb 29, 2024).
14. Contributed (13 minutes): "Fracturing instability in interfacial Hele-Shaw flows involving complex fluids", Session on "Non-Newtonian Flows: Turbulence & Instabilities", 76th Annual Meeting of the Division of Fluid Dynamics, APS, Washington, DC. November 19-21, 2023. Talk given on Nov. 21st, 2023 from 8:39 pm - 8:52 am.
15. Contributed (15 minutes): "Physics-informed Neural Networks (HD-PiNN) for High Dimensional Partial Differential Equations", Session on Data Science & Statistical Learning, 2023 Texas A&M Conference on Energy, College Station, Texas, Sept. 27-29, 2023. Talk given on Sept 28th, 2023 from 3:15 pm - 3:30 pm, Co-author and speaker: undergraduate student David Sanchez
16. Contributed (15 minutes): "Effect of surfactant on polymer flooding with and without shear-thinning polymer in chemical enhanced oil recovery", Session on Energy Savings, 2023 Texas A&M Conference on Energy, College Station, Texas, Sept. 27-29, 2023. Talk given on Sept 28th, 2023 from 3:45 pm - 4:00 pm, Co-author and speaker: Undergraduate student Carlos Acosta
17. **Invited** (25 minutes): "A stability solver for nonlinear mountain waves", in Minisymposium titled "Numerical methods for emerging flow problems in geosciences", ICIAM 2023, Tokyo, Japan. (August 20-25, 2023); Co-authors: Craig Epifanio and Kevin Viner; (Speaker: Craig Epifanio). Talk presented on Monday, August 21.
18. **Invited** (25 minutes): "A machine learning approach to phytoplankton productivity across the Gulf of Mexico", in Minisymposium titled "Numerical methods for emerging flow problems in geosciences", ICIAM 2023, Tokyo, Japan. (August 20-25, 2023); Co-authors: Bailey Armos and Shuang Zhang; (Speaker: Bailey Armos) Talk presented on Monday, August 21.
19. **Invited** (25 minutes): "A hybrid numerical method for dispersive multiphase porous media flows", in Minisymposium titled "Numerical methods for emerging flow problems in geosciences", ICIAM 2023, Tokyo, Japan. (August 20-25, 2023) Talk presented on Monday, August 21.
20. **Invited** (15 minutes): "Singularities and surprises in Hele-Shaw and porous media models of immiscible two-phase displacement flows involving non-Newtonian fluids",

in Minisymposium titled "Mathematical Modelling, Analysis and Simulation of Processes Involving Moving Interfaces", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS23), Bergen, Norway, (June 19-22, 2023). Minisymposium organizers: Tufan Ghosh, Rainer Helmig, and Iuliu Sorin Pop. Talk presented on Monday, June 19.

21. **Invited** (15 minutes): "Singularities and surprises in porous media models of interfacial non-Newtonian flows", in Minisymposium titled "Interfacial phenomena across scales", Interpore 2023, 15th Annual Meeting, Edinburgh, UK (22-25 May 2023). Minisymposium organizers: Ran Holtzman, Kamaljit Singh, Oshri Borgman, Subhadeep Roy, Nathaly Lopes Archilha, Eduardo Abreu. Talk presented on Monday, May 22 during afternoon session 5:00-6:00 pm.
22. Special session (13 minutes): "Singularities in two phase viscoelastic displacement flows in a rectilinear Hele-Shaw cell", Session "Fluids X", Talk on Thu. March 9, 9:36 a.m.–9:48 a.m. PST, 2023 Annual March Meeting of American Physical Society, Las Vegas, Nevada. (March 5-10, 2023).
23. Special session (13 minutes): "Traveling Viscosity Waves and Mild Viscous Fingering: the Unexpected Role of Shear Thinning Revealed by Data Driven Modeling of Shear-Thinning Polymer Flooding", Special Session on "Porous Media Flows: Application", 75th Annual Meeting of the Division of Fluid Dynamics, APS, Indianapolis, Indiana. (Nov. 22, 2022)
24. **Invited** (30 minutes): "Data driven modelling of shear-thinning polymer flooding", in Minisymposium titled "Physics-based and Data-driven models for Engineering Applications", 5th Annual Meeting of the SIAM TX-LA Section, University of Houston. (Nov. 4-6, 2022)
25. **Invited** (20 minutes): "Resonant instability in subcritical mountain wave flows", in Minisymposium titled "Hydrodynamic Stability: Theory, Experiments and Numerics", SES (Society of Engineering Science) 2022 Annual Meeting, College Station. (Oct 16-19, 2022); Co-author and speaker: Craig Epifanio
26. **Keynote** (30 minutes): "Data Driven Modeling of Multiphase Multicomponent Porous Media Flows of Complex Fluids", in Minisymposium titled "Hydrodynamic Stability: Theory, Experiments and Numerics", SES (Society of Engineering Science) 2022 Annual Meeting, College Station. (Oct 16-19, 2022)
27. **Invited** (20 minutes): "Some Recent Useful Results On Stability of Viscoelastic Hele-Shaw Flows", in Minisymposium titled "Hydrodynamic Stability: Theory, Experiments and Numerics", SES (Society of Engineering Science) 2022 Annual Meeting, College Station. (Oct 16-19, 2022)
28. **Invited** (30 minutes): "On Hydrodynamic Stability of Viscoelastic Hele-Shaw Flows", in Minisymposium titled "Stability and Modeling in Non-Newtonian Flows", SIAM 2022 Annual Meeting, Pittsburgh. (July 11-15, 2022)
29. **Invited** (40 minutes): "Data Driven Modeling of Enhanced Oil Recovery by Polymer Flooding", in Minisymposium titled "Hydrodynamic Stability and Simulation of Complex Fluid Flows in Porous Media", USNC/TAM 2022, Austin. (June 19-22, 2022)
30. **Invited** (20 minutes): "Modeling of Dispersive Effects in Multiphase Multicomponent Porous Media Flows", in Minisymposium titled "Hydrodynamic Stability and Simulation of Complex Fluid Flows in Porous Media", USNC/TAM 2022, Austin. (June 19-22, 2022)
31. **Invited** (20 minutes): "Linear Stability Results When a Newtonian Fluid Displaces an Oldroyd-B fluid in a Hele-Shaw Cell", in Minisymposium titled "Hydrodynamic

Stability and Simulation of Complex Fluid Flows in Porous Media", USNC/TAM 2022, Austin. (June 19-22, 2022); Co-author and speaker: Zhiying Hai

32. **Invited** (15 minutes) "A numerical approach to incorporating shear thinning effects of polymer in polymer flooding", in Minisymposium titled "Mathematical and numerical methods for multi-scale multi-physics, nonlinear coupled processes", Interpore 2022, 14th Annual Meeting, Abu Dhabi, UAE (May 28-Jun 2, 2022).
33. Special session (13 minutes): "Dispersive effects in constituent transport during multiphase flows through porous media", Special Session on "Granular Porous Media and Multiphase Flows II", APS March Meeting, Chicago, (March 14-18, 2022).
34. "B. R. Seth Memorial (Plenary) Lecture" (one hour): "Aspects of Modeling and Linear Instability of Viscoelastic Hele-Shaw Flows", 66th Congress of ISTAM (an International Conference), Virtual Mode at VIT-AP University, Amaravati, Andra Pradesh, India, (Dec. 03-05, 2021).
35. Special session (15 minutes): "Linear instability of viscoelastic interfacial Hele-Shaw flows: Newtonian fluid displacing an upper-convected Maxwell fluid", Special Session on "Flow Instability: Elastic and Complex Fluids and Multiphase Flows", 74th Annual Meeting of the Division of Fluid Dynamics, APS, Phoenix, Arizona, (Nov. 21-23, 2021).
36. Special session (15 minutes): "Linear instability of viscoelastic interfacial Hele-Shaw flows: Upper convected Maxwell (UCM) fluid displacing another UCM fluid", Special Session on "Flow Instability: Elastic and Complex Fluids and Multiphase Flows", 74th Annual Meeting of the Division of Fluid Dynamics, APS, Phoenix, Arizona, (Nov. 21-23, 2021); Co-author and speaker: Zhiying Hai
37. Special session (15 minutes): "Studies on hydrodynamic stability of viscoelastic flows in a Hele-Shaw cell", Special Session on "Flow of Complex Fluids", APS March Meeting, ONLINE, (March 15-19, 2021).
38. Contributed (15 minutes): "A hybrid numerical method for modeling shear thinning effect in non-Newtonian porous media flow", SIAM 2020 Virtual Annual Meeting, Toronto, Canada. (July 6-10, 2020).
"video"
39. Special session (15 minutes): "A study of the effect of shear thinning in EOR by surfactant-polymer flooding", Special Session on "Porous Media Flow", 72nd Annual Meeting of the Division of Fluid Dynamics, APS, Seattle, WA, (Nov. 23-26, 2019). Co-author and speaker: Rohit Mishra
40. Contributed (15 minutes): "A study of the non-Newtonian effects in chemical EOR using Polymer", 2019 Texas A&M Conference on Energy, (Sept. 23-25, 2019); Co-author and speaker: Rohit Mishra
41. Invited (1 hour): "Algorithms, Modeling, and Beauty in Fluid Mechanics", Aug 1, Texas A&M - Beihang Summer Program, (July 30-August 2, 2019).
42. Contributed (20 minutes): "Mathematical and computational challenges for multiphase porous media flows in chemical EOR", Special Session on "Applied Mathematics for Industry and Engineering I", ICIAM-2019, Valencia, Spain, (July 15-19, 2019).
43. **Invited** (25 minutes): "Recent Results and Perspectives on Multi-phase Multi-component Porous Media Flows in Chemical EOR", in Minisymposium titled "Novel Computational Methods and Stabilization of Fingering Instabilities for Porous Media Flows in Chemical EOR", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS19), Houston, USA, (March 11-14, 2019). video of my talk

44. **Invited** (25 minutes): "Results on the Stabilization of Fingering Instabilities in Porous Media Flows", in Minisymposium titled "Novel Computational Methods and Stabilization of Fingering Instabilities for Porous Media Flows in Chemical EOR", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS19), Houston, USA, (March 11-14, 2019); Co-author and speaker: Craig Gin
45. **Invited** (25 minutes): "On the Immiscible Displacement of Viscoelastic Fluids in a Hele-Shaw Cell", in Minisymposium titled "Novel Computational Methods and Stabilization of Fingering Instabilities for Porous Media Flows in Chemical EOR", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS19), Houston, USA, (March 11-14, 2019); Co-author and speaker: Zhiying Hai
46. Contributed (15 minutes): "Enhanced time dependent injection rate for multilayer stable Hele-Shaw flows", 71st Annual Meeting of the Division of Fluid Dynamics, APS, Atlanta, GA, (Nov. 18-20, 2018).
47. **Invited** (15 minutes) "An overview of mathematical, physical and computational challenges in chemical enhanced oil recovery", in the Minisymposium "Mathematical, physical and computational aspects of chemical enhanced oil recovery", Interpore 10th Annual Meeting, New Orleans, USA (May 14-17th, 2018).
48. **Invited** (half hour) "Challenges in mathematical modeling and computation of porous media flows for chemical enhanced oil recovery", UTRGV Symposium on Mathematics and its Applications, Department of Mathematics, The University of Texas-Rio Grande Valley– Edinburg Campus, TX, (April 7, 2018).
49. **Invited** (one hour): "A brief digression of my research in applied and computational mathematics", MGSO Seminar Series, Mathematics Department, Texas A&M University, College Station, TX-77843, (April 8, 2018).
50. **Invited** (one hour) "Stability, modeling and DFEM-MMOC based hybrid method for the simulation of multiphase multi-component porous media flows", Department of Mathematics, IIT Delhi, India, (Dec. 18, 2017).
51. **Invited** (one hour) "Stability, modeling and DFEM-MMOC based hybrid method for the simulation of multiphase multi-component porous media flows", Department of Mathematics, IIT Ropar, India, (Dec. 13, 2017).
52. **Invited** (week long: 4 hours per day) "Hydrodynamic Stability". Department of Mathematics, IIT Roper, India, (Dec. 11-15, 2017).
53. Contributed (15 minutes): "Viscous fingering and channeling in chemical enhanced oil recovery", 70th Annual Meeting of the Division of Fluid Dynamics, APS, Denver, Colorado, (Nov. 19-21, 2017).
54. Contributed (15 minutes): "Dispersive effects on multicomponent transport through porous media", 70th Annual Meeting of the Division of Fluid Dynamics, APS, Denver, Colorado, (Nov. 19-21, 2017); Co-author and speaker: Sourav Dutta
55. Contributed (15 minutes): "The Stability and Interfacial Motion of Multi-layer Radial Porous Media and Hele-Shaw Flows", 70th Annual Meeting of the Division of Fluid Dynamics, APS, Denver, Colorado, (Nov. 19-21, 2017); Co-author and speaker: Craig Gin
56. **Invited** (one hour) "Mathematics of Stability Theory and Chaos Theory", Applied Mathematics Undergraduate Seminar (AMUSE), Department of Mathematics, Texas A&M University, (Oct 18, 2017).
57. **Colloquium** (one hour) "Some recent results on the stability and modeling of multiphase porous media flows", Department of Mathematics, Texas A&M University, (Sept 21, 2017).

58. **Invited** (20 minutes): "Chemical enhanced oil recovery driven models and methods for multiphase multicomponent Newtonian and non-Newtonian/viscoelastic porous media flows", in Minisymposium titled "Standard and nonstandard models and numerical methods for complex porous media flows with applications", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS17), Erlangen, Germany, (Sept 11-14, 2017).

59. Contributed (15 minutes): "On the Modeling of Displacement of Non-Newtonian Fluids in Porous Media Flows", SIAM 2017 Annual Meeting, Pittsburgh, PA. (July 10-14, 2017).
60. Contributed (15 minutes): "Complete Stabilization of Multi-Layer Radial Hele-Shaw Flows Using a Time-Dependent Injection Rate and the Associated Interface Motion", SIAM 2017 Annual Meeting, Pittsburgh, PA. (July 10-14, 2017). Co-author and speaker: Craig Gin.
61. Contributed (15 minutes): "Modeling and Simulation of Multicomponent, Multiphase Porous Media Flows Using a New Hybrid Method", SIAM 2017 Annual Meeting, Pittsburgh, PA. (July 10-14, 2017). Co-author and speaker: Sourav Dutta.
62. **Invited** (one hour): "An Overview of Chemical Enhanced Oil Recovery and Recent Advances", Southwest Research Institute, San Antonio, TX, (April 10, 2017).
63. **Invited** (one hour) "Mathematics of Oil Recovery", Applied Mathematics Undergraduate Seminar (AMUSE), Department of Mathematics, Texas A&M University, (April 05, 2017).
64. Contributed (25 minutes): "On stability of viscoelastic fluid flow in porous media", 2017 Texas PDE Conference, College Station, TX, (Mar. 4-5, 2017).
65. Contributed (25 minutes): "A modern hybrid method for multiphase, multicomponent flow and transport in porous media", 2017 Texas PDE Conference, College Station, TX, (Mar. 4-5, 2017); Co-author and speaker: Sourav Dutta.
66. Contributed (30 minutes): "A numerical study of immiscible two-phase multicomponent flows in highly heterogeneous porous media", 2017 Joint Mathematics Meetings, Atlanta, GA, (Jan. 4-7, 2017); Co-author and speaker: Sourav Dutta
67. Contributed (15 minutes): "Dispersive effects on the multi-layer porous media flows with permeable and impermeable interfaces", 69th Annual Meeting of the Division of Fluid Dynamics, APS, Portland, OR, (Nov. 20-22, 2016).
68. Contributed (30 minutes): "Modeling and simulation of multicomponent, multiphase porous media flows using a new hybrid method", 2016 Texas A&M Conference on Energy, (Sept. 26-28, 2016); Co-author and speaker: Sourav Dutta
69. **Invited Colloquium** (one hour): "Mathematical and Computational Aspects of Multiphase Multi-component Porous Media Flows", Department of Mathematics, Indian Institute of Technology, Kharagpur, India, (August 17, 2016).
70. **Invited** (25 minutes): "Physical and Mathematical Modeling of Chemical Enhanced Oil Recovery", in Minisymposium titled "Fluid Physics and Advanced Numerical Methods for Chemical Enhanced Oil Recovery", SIAM 2016 Annual Meeting, Boston, MA. (July 11-15, 2016).
71. **Invited** (one hour) "Introduction to Asymptotics", Applied Mathematics Undergraduate Seminar (AMUSE), Department of Mathematics, Texas A&M University, (April 20, 2016).
72. **Invited** (one hour): "Modeling and simulation of multiphase multicomponent porous media flows in the context of chemical enhanced oil recovery," Computational Sciences Seminar Series, Department of Mathematics, University of Texas at Dallas, (April 14, 2016).

73. **Invited** (50 minutes): "Topics in Applied Mathematics", First year graduate student seminar, Department of Mathematics, Texas A&M University, (Jan 27, 2016).
74. Contributed (15 minutes): "Modeling and simulation of multiphase multicomponent multi-physics porous media flows in the context of chemical enhanced oil recovery", 68th Annual Meeting of the Division of Fluid Dynamics, APS, Boston, MA, (Nov. 22-24, 2015); Co-author: Sourav Dutta.
75. Contributed (15 minutes): "On the stabilizing role of species diffusion in chemical enhanced oil recovery", 68th Annual Meeting of the Division of Fluid Dynamics, APS, Boston, MA, (Nov. 22-24, 2015); Co-author: Craig Gin.
76. **Invited** (50 minutes): "Topics in Applied Mathematics", First year graduate student seminar, Department of Mathematics, Texas A&M University, (March 04, 2015).
77. Contributed (15 minutes): "A New Saffman-Taylor Growth Rate Formula", 67th Annual Meeting of the Division of Fluid Dynamics, APS, San Francisco, CA, (Nov. 23-25, 2014).
78. Contributed (15 minutes): "Stability Results on Multi-Layer Radial Porous Media and Hele-Shaw Flows with Variable Viscosity", 67th Annual Meeting of the Division of Fluid Dynamics, APS, San Francisco, CA, (Nov. 23-25, 2014); Co-author: Craig Gin.
79. Invited (25 minutes): "Fast Iterative Methods for The Variable Diffusion Coefficient Equation in a Disk", in Minisymposium titled "Boundary Integral Equations and Their Applications - Part IV of IV", SIAM 2014 Annual Meeting, Chicago, Ill (July 7-11, 2014). Talk given by Aditi Ghosh on July 11, Co-authors: Joungdong Kim and Prabir Daripa
80. Contributed (15 minutes): "Instability of displacement of an Oldroyd-B fluid by air in a Hele-Shaw cell", APS March Meeting, Denver, CO, (March 03-07, 2014).
81. Contributed (15 minutes): "Stability Results on Multi-Layer Radial Hele-Shaw Flows", 66th Annual Meeting of the Division of Fluid Dynamics, APS, Pittsburg, PA, (Nov. 24-26, 2013); Co-author: Craig Gin.
82. Contributed (15 minutes): "Saffman-Taylor Instability for a non-Newtonian fluid", 66th Annual Meeting of the Division of Fluid Dynamics, APS, Pittsburg, PA, (Nov. 24-26, 2013).
83. **Invited** (one hour): "Mathematical and Computational Aspects of Chemical Enhanced Oil Recovery Process", in International Workshop on Enhanced Oil Recovery and Porous Media Flows", TAMUQ, Doha, Qatar, July 29- (August 1, 2013). Related Video
84. Contributed (15 minutes): "Application of FFT-recursive-relation based hybrid fast algorithms to computing interfacial flows", SIAM 2013 Annual Meeting, San Diego, CA. (July 8-12, 2013); Co-Author: Joung Dong Kim.
85. Contributed (15 minutes): "Numerical Evidence of Extreme Diffusive Stabilization in Immiscible Models of Chemical Enhanced Oil Recovery", SIAM Ammual Meeting, San Diego, CA, (July 8-12, 2013).
86. **Invited** (30 minutes): "Theoretical and Computational Perspectives on Chemical Enhanced Oil Recovery Processes", in Minisymposium titled "Theory and computation of porous media flows in oil reservoirs", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS13), Padova, Italy, (June 17-20, 2013).
87. **Invited** (25 minutes): "An Efficient Numerical Method for ASP Flooding in Tertiary Oil Recovery", in Minisymposium titled "Theory and computation of porous media flows in oil reservoirs", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS13), Padova, Italy, (June 17-20, 2013): Co-author: Sourav Dutta.

88. Poster Session: "Application of a fast algorithm to solving the pressure equation efficiently for Darcy's flow in porous media", SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS13), Padova, Italy, (June 17-20, 2013).
89. **Invited** (20 minutes): "Fluid dynamical and modeling issues of chemical flooding for enhanced oil recovery", in Petroleum Technology Minisymposium on "Multi-scale Reservoir Characterization for Effective Enhanced Oil and Gas Recovery", Organized within "Petroleum Technology Symposium" in OMAE2013 conference, Nantes, France, (June 9-14, 2013).
90. Contributed talk (15 minutes): "Universality Results for Multi-phase Hele-Shaw Flows", APS March Meeting, Baltimore, MD, (March 18-22, 2013).
91. **Invited** (25 minutes): "A Fast Algorithm for Biharmonic Equation and Applications", in the minisymposium titled "Fast Algorithms for Integral Equations Methods and Their Applications" at SIAM Conference on Computational Science and Engineering, Boston, USA. (Feb 25 - March 01, 2013).
92. **Invited** (60 minutes): "Introduction of some application driven problems and fast algorithms", First year graduate student seminar, Mathematics Department, Texas A&M University, College Station, TX-77843, (Feb. 14, 2013).
93. Contributed (15 minutes): "Relevance of Linear Stability Results to Enhanced Oil Recovery", 65th Annual Meeting of the Division of Fluid Dynamics, APS, San Diego, CA, (Nov. 18-20, 2012); Co-author: Xueru Ding
94. Contributed (15 minutes): "Universality Results for Multi-Layer Hele-Shaw and Porous Media Flows", 65th Annual Meeting of the Division of Fluid Dynamics, APS, San Diego, CA, (Nov. 18-20, 2012).
95. **Invited** Colloquium (one hour) "Fluid dynamical and modeling issues of chemical flooding for enhanced oil recovery", Petroleum Engineering Seminar, Louisiana State University, Baton Rouge, (Sept 28, 2012).
96. Contributed (15 minutes): "Numerical Studies of EOR by ASP-flooding", 2012 SIAM Annual Meeting, Minneapolis, Minnesota, (July 9-13, 2012); Co-author: Xueru Ding.
97. Contributed (15 minutes): "An efficient numerical method for solving coupled systems of elliptic interface and hyperbolic partial differential equations with applications to enhanced oil recovery", 2012 SIAM Annual Meeting, Minneapolis, Minnesota, (July 9-13, 2012); Co-author: Liqun Wang.
98. Contributed (15 minutes): "Universal Stability Properties for Multi-Layer Hele-Shaw Flows and its Application to Instability Control", Minneapolis, Minnesota, 2012 SIAM Annual Meeting, (July 9-13, 2012).
99. Poster Presentation: "A Fast Algorithm to Solve Slow Incompressible Steady Flows", 2012 SIAM Annual Meeting, Minneapolis, Minnesota, (July 9-13, 2012); Co-author: Aditi Ghosh.
100. **Invited** (one hour) "Introducing some applied problems from fluid mechanics", Applied Mathematics Undergraduate Seminar (AMUSE), Department of Mathematics, Texas A&M University, (April 11, 2012).
101. **Invited** (one hour) "On stability results on multi-layer Hele-Shaw flows arising in the context of Enhanced Oil Recovery", Integrability and Applied Mathematics Seminar, Department of Mathematics, University of Central Florida, (March 16th., 2012).
102. **Invited** (one hour): "On three-layer flows and the eigenvalue problem", Department of Mathematics, Universidad Tecnica Federico Santa Maria, Valparaiso-Chile, (Jan 18, 2012).

103. Contributed (15 minutes): "Optimal constant time injection policy for enhanced oil recovery and characterization of optimal viscous profiles", 64th Annual Meeting of the Division of Fluid Dynamics, APS, Baltimore, Maryland, (Nov. 20-22, 2011).
104. **Invited** Lecture Series (5 days, 6 hours per day): 5 day Course on Computational Fluid Dynamics, under the initiative of IUCEE (Indo-US Collaboration on Engineering Education), delivered at VelTech University, Chennai, India, (Aug 8 - Aug 12, 2011).
    Video of an one-hour lecture given as part of this lecture series. The Video shows the one specifically delivered for motivating undergrads to study CFD. It was on FLI link since 2012 but posted on youtube just recently (around 1/26/2016).
105. **Invited** Seminar (one hour): "Some theoretical and numerical results on enhanced oil recovery by ASP flooding in Porous media", Applied Mechanics Seminar, Department of Applied Mechanics, IIT, Chennai, India, (Aug. 11, 2011).
106. **Invited** (25 minutes): "Modeling of complex flows involving interfaces", in Minisymposium on "Coupling of interface methods with PDEs and their applications - Part IV", ICIAM-2011 Meeting, Vancouver, Canada, (July 18-22, 2011).
107. Contributed (20 minutes): "Effect of Variable Viscosity on Stabilization in Hele-Shaw Flows", ICIAM-2011 Meeting, Vancouver, Canada, (July 18-22, 2011).
108. **Invited** (one hour): "Instability control in enhanced oil recovery by ASP-flooding using Hele-Shaw model", Hawaii University International Conferences On Mathematics and Engineering, Honolulu, Hawaii, (June 13–15, 2011).
109. **Invited** (30 minutes): "Mathematical problems arising in chemical enhances oil recovery", Hawaii University International Conferences On Mathematics and Engineering, Honolulu, Hawaii, (June 13–15, 2011).
110. **Invited** (one hour): "A survey of some problems from chemical enhanced oil recovery", Simion Stoilow Institute of Mathematics of the Romanian Academy, Bucharest, Romania, (April 13, 2011).
111. Contributed (15 minutes): "Generalized Saffman-Taylor formula for multi-layer Hele-Shaw flows", APS March Meeting, Dallas, Texas (March 21-25, 2011).
112. **Invited** Colloquium (one hour): "Generalized Saffman-Taylor formula for multi-layer Hele-Shaw and porous media flows", Applied Mathematics Seminar, Department of Applied Mathematics, Institute of Technology, Benaras Hindu University (BHU), Varanasi, India, (Jan 03, 2011).
113. **Plenary** (one hour) "Application driven development of some useful fast algorithms for PDEs", International Conference on Mathematics of Date, Allahabad, India, (Dec 31, 2010 - Jan 04, 2011).
114. **Plenary** (one hour) "Generalized Saffman-Taylor formula for multi-layer Hele-Shaw and porous media flows", Jan 01, 2011, International Conference on Mathematics of Date, Allahabad, India, (Dec 31, 2010 - Jan 04, 2011).
115. Contributed (15 minutes): "Singularity Formation in a Model of Shallow Water Wave Equations", 63rd Annual Meeting of the Division of Fluid Dynamics, APS, Los Angeles (Nov. 21-23, 2010).
116. Contributed (15 minutes): "Effect of Variable Viscosity on Stabilization in Hele-Shaw Flows", 63rd Annual Meeting of the Division of Fluid Dynamics, APS, Los Angeles (Nov. 21-23, 2010).
117. **Invited** Colloquium (one hour): "Thin film problems in Fluid Mechanics", Applied Mathematics Seminar, Mathematics Department, Indian Institute of Technology, Kharagpur, India, (August 13, 2010).

118. **Invited** Colloquium (one hour): "On porous media flows involving chemical EOR", Distinguished Lecture Series, Indian School of Mines, **Dhanbad**, India, (August 10, 2010).
119. **Invited** Colloquium (one hour): "Thin film problems in Fluid Mechanics", Invited one-hour colloquium talk, Mathematics and Physics Unit, Indian Statistical Institute, **Kolkata**, India, (July 29, 2010).
120. Contributed (15 minutes): "Stability Results on Multi-Layer Hele-Shaw Flows", 2010 SIAM Annual Meeting (AN10), Pittsburgh, Pennsylvania, (July 12-16, 2010).
121. Contributed (15 minutes): "Modeling Complex Fluid Flows in Porous Media", 2010 SIAM Annual Meeting (AN10), Pittsburgh, Pennsylvania, (July 12-16, 2010),
122. Contributed (25 minutes): "Stability enhanced models of chemical enhanced oil recovery processes", US National Congress on Theoretical and Applied Mechanics, at 4:35-5:00 pm on July 1, Penn State University, College Park, (June 27-July 2, 2010).
123. Contributed (25 minutes): "Thin films and fingering problems in complex flows", US National Congress on Theoretical and Applied Mechanics, 3:20-3:45 pm on July 1, Penn State University, College Park, (June 27-July 2, 2010).
124. **Plenary** (one hour): "Physical and computational issues in modeling chemical enhanced oil recovery by ASP-flooding", Seventh Panamerican Workshop in Applied and Computational Mathematics/ Computational Science and Engineering, Choroni, Venezuela, (June 6-11, 2010).
125. **Invited** colloquium (one hour): "Some Fundamental Research Motivated by EOR (Enhanced Oil Recovery) Technology", Engineering, Texas A&M University at Qatar, Doha, (May 27, 2010).
126. **Invited** colloquium (one hour): "Some Application Driven Fast Algorithms for PDEs", College of Science, Texas A&M University at Qatar, Doha, (May 20, 2010).
127. **Invited** colloquium (one hour): "Stabilization of hydrodynamic instabilities in Hele-Shaw flows", Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA, (April 29, 2010).
128. **Invited** colloquium talk (one hour): "Effect of surfactant on the thin-film in Landau-Levich (in Coating theory) and Bretherton problems (bubbles in capillary tube)", Mechanical Engineering Seminar, NJIT, New Jersey, NJ, (April 28, 2010).
129. **Invited** colloquium talk (one hour): "Some recent results on multi-layered Hele-Shaw flows", Applied Mathematics Seminar, NJIT, New Jersey, NJ, (April 26, 2010).
130. **Invited** colloquium talk (one hour): "Mathematical and Computational Modeling of Complex Fluid Flows in Porous Media for Enhanced Oil Recovery", Applied Mathematics Seminar, UNAM, Mexico City, Mexico, (April 22, 2010).
131. **Invited** (35 minutes): "Issues and directions of ASP-flooding in Enhanced Oil Recovery", BIT's 1st Annual Congress: Well Simulation and EOR 2010, Chengdu, China, (April 12-14, 2010).
132. **Invited** Math-Physics Seminar (one hour): "Some Results on Multi-Layer Hele-Shaw Flows", in Mathematical Physics Seminar Series, Department of Mathematics, Texas A&M University, (March 12, 2010).
133. Contributed (15 minutes): "Surfactant effects on the motion of long bubbles in a capillary tube", 62th Annual Meeting of the Division of Fluid Dynamics, APS, Minneapolis, Minnesota, (Nov. 22-24, 2009).
134. **Invited** (30 minutes): "Some topics in computational and applied mathematics", Graduate Seminar Series, Mathematics Department, Texas A&M University, College Station, TX-77843, (Oct. 8, 2009).

135. **Invited** (one hour): "Some personal case studies of the interplay between Mathematics and Fluid Mechanics", MGSO Seminar Series, Mathematics Department, Texas A&M University, College Station, TX-77843, (April 15, 2009).
136. **Invited** (30 minutes): "An Overview of Some Recent and New Fast Algorithms for Solving PDEs based on Green's Function Approach", at 9:30 am on 03/02/09, invited minisymposium talk at SIAM 2009 CSE Meeting, Miami, Fl, (March 2-6, 2009).
137. Contributed (15 minutes): "Hydrodynamic Stability in Hele-Shaw and Porous Media Flows", at 10:30 am, 24th Nov, 61st Annual Meeting of the Division of Fluid Dynamics, APS, San Antonio, TX, (Nov. 23-25, 2008).
138. **Invited** (one hour): "Hydrodynamic Instability in Hele-Shaw and Porous Media Flows," Department of Mathematics, Universidad Tecnica Federico Santa Maria, Valparaiso-Chile, (Sept 8, 2008).
139. **Plenary** talk (one hour): "Some results on the Saffman-Taylor Instability in Hele-Shaw Flows: Nonlinearity and Effect of Many Layers and Diffusion," Fifth World Congress of Nonlinear Analysis, Orlando, Florida (July 2-9, 2008).
140. Contributed (20 minutes): "Diffusive Slowdown of Instabilities in Three-Layer Hele-Shaw Flows," Texas PDE Conference, Houston, Texas, (April 5-6, 2008).
141. Contributed (15 minutes): "Thickening effect of surfactants in the drag-out coating problem," 60 Annual Meeting of the Division of Fluid Dynamics, APS, Salt Lake City, Utah, (Nov. 18-20, 2007).
142. Contributed (15 minutes): "Stability Results on Multi-Layer Hele-Shaw Flows," 60 Annual Meeting of the Division of Fluid Dynamics, APS, Salt Lake City, Utah, (Nov. 18-20, 2007).
143. **Invited** (one hour): "Stability of multi-layer Hele-Shaw flows with and without diffusion," Department of Mathematics, SMU, Dallas, (Nov. 7, 2007).
144. **Invited** (one hour): "Multi-phase flow and enhanced oil recovery", College of Engineering, PVAMU, Prairie View, Texas, (Nov. 6, 2007).
145. **Invited** (20 minutes): "Role of Multi-Scale in Unstable Multi-Layer Hele-Shaw Flows," in Minisymposium on "High Speed Flows", 4:50 - 5:15 pm, 23rd Oct, 44th Annual Technical Meeting of the Society of Engg. Sciences, College Station, Texas. (Oct. 21-24, 2007).
146. Contributed (20 minutes): "Diffusive Slowdown of Instabilities in Three-Layer Hele-Shaw Flows," General Sessions, 11:15 - 11:40 am, 24th Oct, 44th Annual Technical Meeting of the Society of Engg. Sciences, College Station, Texas. (Oct. 21-24, 2007).
147. **Invited** (one hour): "On Stability of multi-layer Hele-Shaw flows," Invited one-hour colloquium talk, Mathematics and Physics Unit, Indian Statistical Institute, **Kolkata**, India, (August 16, 2007).
148. **Invited** (one hour): "On Fast Algorithms for PDEs in simple and complex geometries," Invited one-hour colloquium talk, Mathematics Department, Indian Institute of Technology, **Kharagpur**, India, (August 14, 2007).
149. **Invited** (one hour): "On Stability of multi-layer Hele-Shaw flows," Invited one-hour colloquium talk, Mathematics Department, Indian Institute of Technology, **Kharagpur**, India, (August 13, 2007).
150. Contributed (20 minutes): "Fast Algorithms for PDEs in simple and complex geometries," 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, (July 16-20, 2007).
151. Contributed (15 minutes): "Fast and Accurate Methods with Domain Embedding", 2007 SIAM Conf. on Comp. Sci. & Engg., Costa Mesa, CA, (Feb 19-23, 2007).

152. Contributed (15 minutes): "On Multi-Phase Flows", 2007 SIAM Conf. on Comp. Sci. & Engg., Costa Mesa, CA, (Feb 19-23, 2007).
153. Contributed (15 minutes): "Studies on Three-Layer Hele-Shaw Flows," 59th Annual Meeting of the Division of Fluid Dynamics, APS, Tampa, Florida, (Nov. 19-21, 2006).
154. **Invited** (30 minutes): "Solving Partial Differential Equations in Complex Domains," SICAM (Second International Conference of Applied Mathematics), Plovdiv, Bulgaria, (August 11-18, 2005).
155. **Invited** (30 minutes): "Stability Analysis in Three-layer Hele-Shaw Problem," SICAM (Second International Conference of Applied Mathematics), Plovdiv, Bulgaria, (August 11-18, 2005).
156. Contributed (15 minutes): "Computing in Irregular Domains," SIAM04 Annual Meeting, Portland, Oregon, (July 11-15, 2004).
157. Contributed (15 minutes): "Instability in Three-Layer Hele-Shaw Model Induced by Mild Heterogeneity," SIAM04 Annual Meeting, Portland, Oregon, (July 11-15, 2004).
158. **Keynote** (45 minutes): "Fast Methods for Nonlinear PDEs in Complex Domains," WCNA04 (World Congress on Nonlinear Analysis), Orlando, Florida, (June 30 - July 7, 2004).
159. **Invited** (one hour): "Some Recent Results in Porous Media Flows," Applied-Math-Seminar talk, Mathematics Department, Texas A&M University, College Station, TX-77843, (May 3, 2004).
160. Contributed (15 minutes): "Scale-Up and Enhanced Oil Recovery," SIAM Conference on Mathematical and Computational Issues in the Geosciences(GS03), Austin, Texas, (March 17-20, 2003).
161. **Invited** (25 minutes): "Applications of Some Fast Algorithms for Elliptic PDEs," invited minisymposium talk at SIAM03 CSE Meeting, Philadelphia, PA, (Feb. 2003).
162. **Invited** (25 minutes): "An Overview of Some Fast Algorithms for Elliptic PDEs," Invited minisymposium talk at SIAM03 CSE Meeting, Philadelphia, PA, (Feb. 2003).
163. **Invited** (one hour): "Some Fast Algorithms and Their Applications," Invited one-hour colloquium talk, Mathematics Department, Indian Institute of Technology, **Kanpur**, India, (Jan. 2, 2003).
164. **Invited** (one hour): "Some Modern Trends in Simulation of Porous Media Flows," Invited one-hour colloquium talk, Physics and Applied Mathematics Division, Indian Statistical Institute, Calcuatta, India, (December 31, 2002).
165. **Plenary** (one hour): "Role of Classical Methods for Application Driven Algorithms," Invited university-wide one-hour colloquium talk at "National Symposium on Mathematical Methods and Applications" (On the occasion of Srinivas Ramanujan's birthday), Indian Institute of Technology, **Chennai**, India, (December 20-22, 2002).
166. Contributed (15 minutes): "Simulation of Hemodynamic Flows in Catheterized Artery," in session on "Biological Models," SIAM50 Annual Meeting, Philadelphia, PA, (July 2002).
167. **Invited** (one hour): "Modeling, Simulation, and Algorithms in Porous Media Flows," invited talk in minisymposium on "Forward and Inverse Problems in Multiphase Flow Through Porous Media", SIAM50 Annual Meeting, Philadelphia, PA, (July 2002).
168. **Invited** (one hour): "An overview of some fast algorithms: recent and ongoing works and some open problems," invited one-hour colloquium talk at the Institute of Mathematics, Romanian Academy of Sciences, Bucharest, Romania, (May 27, 2002).
169. **Invited** (30 minutes): "Evolving interfaces and the algorithms for their computations," invited one-hour colloquium talk at the Institute of Mathematics, Romanian Academy of Sciences, Bucharest, Romania, (May 30, 2002).

170. Contributed (15 minutes): "Fluid Flows Involving a Compound Multiphase Droplet," Fourth International Conference on Multiphase Flow, New Orleans, Louisiana, (June 2001).
171. Contributed (15 minutes): "Computation of Viscous Flows in Two and Three-Dimensions," First SIAM Conference on Computational Science and Engineering, Washington D.C., (Sep. 2000).
172. Contributed (15 minutes): "Implementations of Some Recently Developed Fast Algorithms," First SIAM Conference on Computational Science and Engineering, Washington D.C., (Sep. 2000).
173. **Invited** (30 minutes): "Sur une méthode spectrale de domaines fictifs utili sant un contrôle optimal distribué," ("On Spectral Domain Embedding Method Using Distributed Optimal Control"), 5th France-Romanian Conference of Applied Mathematics, Constanta, Romania, (talk given by Co-author), (August 2000).
174. **Keynote** (30 minutes): "Recent Advances in Fast Algorithms for Partial Differential Equations," IMACS Intl. Conf. on Scientific Computing and Mathematical Modeling, Milwaukee, Wisconsin, (May 2000).
175. Contributed (15 minutes): "Relevance of the Sixth-Order Boussinesq Equation for Water Waves," IMACS Intl. Conf. on Scientific Computing and Mathematical Modeling, Milwaukee, Wisconsin, (May 2000).
176. Contributed (15 minutes): "A New Class of Model Equations for Two-way Propagation of Capillary-Gravity Water Waves," Annual Meeting of the American Physical Society, Fluid Dynamics Division, New Orleans, Louisiana, (Nov. 1999).
177. Contributed (15 minutes): "A New Class of Models and Their Study for Bi-directional Propagation of Capillary-Gravity Water Waves," 36th Annual Technical Meeting, Society of Engineering Sciences, Austin, Texas, (Oct. 1999).
178. Contributed (20 minutes): "Rapid Design of Subcritical Airfoils," 30th AIAA Fluid Dynamics Conference, Norfolk, Virginia, (June 1999).
179. Contributed (15 minutes): "A Parallel Version of A Fast Algorithm for Singular Integral Transforms," IMACS-International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'99), Las Vegas, Nevada, (June 1999).
180. Contributed (15 minutes): "Local and Nonlocal Solitary Waves of Boussinesq Equations," 13th ASCE Engg. Mech. Specialty Conference, Johns Hopkins University, Baltimore, Maryland, (May 1999).
181. **Invited** (30 minutes): "Local and Nonlocal Solitary Waves of Boussinesq Equations," SIAM Conference on Applications of Dynamical Systems, Snow Bird, Utah, (May 1999).
182. Contributed (15 minutes): "Nonlinear Evolution, Filtering, Regularization and Control of Short Wave Instabilities," SIAM Conference on Applications of Dynamical Systems, Snow Bird, Utah, (May 1999).
183. Contributed (15 minutes): "A Fast Parallel Algorithm for Singular Integral Transforms," SIAM Annual Meeting, Atlanta, Georgia, (talk given by Co-author), (May 1999).
184. Contributed (15 minutes): "Numerical and Theoretical Studies of Some Model Equations for Bi-Directional Propagation of Nonlinear Dispersive Long Waves," SIAM Annual Meeting, Atlanta, Georgia, (May 1999).
185. **Invited** (one hour): "Numerical Experiment On an Illposed Boussinesq Equation," Applied Mathematics Seminar, Department of Mathematics, Texas A&M University, College Station, Texas, (April 1999).

186. Contributed (15 minutes): "Nonlinear Waves in Fluids", IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia, (March 1999).
187. **Invited** (30 minutes): "Investigation of Some Nonlinear Wave Equations and Associated Phenomena," IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia, (March 1999).
188. **Invited** (one hour): "A Fast Integral Equation Method for Solving PDEs", Numerical Analysis Seminar, Department of Mathematics, Texas A&M University, College Station, Texas, (April 1999).
189. **Invited** (one hour): "Numerical Simulation of Enhanced Oil Recovery," Invited one-hour colloquium talk, Mathematics Department, Indian Institute of Technology, Kharagpur, India, (Jan. 1999).
190. Contributed (15 minutes): "An Efficient and Novel Numerical Method for Quasiconformal Mappings of Doubly Connected Domains," SIAM Annual Meeting, Toronto, Canada, (July 1998).
191. Contributed (15 minutes): "Rapid Design of Subcritical Airfoils," SIAM Annual Meeting, Toronto, Canada, (July 1998).
192. Contributed (15 minutes): "On the Fastest Smooth Taylor-Bubble Problem," SIAM Annual Meeting, Toronto, Canada, (July 1998).
193. **Invited** (one hour talk): "Turbulent Combustion Modeling of Coal: Biomass Blends in a Swirl Burner I: Preliminary Results," 8th Annual International Energy Week Conference and Exhibition, Houston, Texas, (talk presented by Co-author), (Jan. 1997).
194. **Invited** (one hour talk): "A Fast Numerical Method for Solving Elliptic Equations," Invited one-hour colloquium talk, Mathematics Department, New Jersey Institute of Technology, New Jersey, NJ, (December 1996).
195. **Invited** (one hour talk): "A Fast Numerical Method for Solving Elliptic Equations," Numerical Analysis Seminar, Courant Institute, New York, NY, (Nov. 1996).
196. **Invited** (30 minutes) "Recent Advances on Inverse Airfoil Design," 9th Conf. of the European Consortium for Mathematics in Industry, Copenhagen, Denmark, (June 1996).
197. Contributed (15 minutes): "A Numerical Study of an Illposed Boussinesq Equation Arising in Water Waves," SIAM Annual Meeting, Charlotte, North Carolina, (Oct. 1995).
198. Contributed (15 minutes): "Fast, Accurate and Parallel Algorithms for Solving Some Nonlinear Partial Differential Equations," SIAM Annual Meeting, Charlotte, North Carolina, (Oct. 1995).
199. Contributed (15 minutes): "A Numerical Study of An Ill-Posed Nonlinear Wave Equation," 31st Annual Meeting of the Society of Engineering Sciences, College Station, Texas, (Oct. 1994).
200. Contributed (15 minutes): "The Rising Plane Bubble Problem," Annual Meeting of the American Physical Society, Fluid Dynamics Division, Tallahassee, Florida, (Nov. 1992).
201. **Invited** (20 minutes): "Some Novel Techniques for Grid Generations and Quasiconformal Mappings," SIAM Annual Meeting, Los Angeles, (July 1992).
202. Contributed (15 minutes): "Numerical Experiments on Quasi-conformal Mapping," SIAM Annual Meeting, Los Angeles, (July 1992).

203. Contributed (15 minutes): "Theory and Computations of the Rising Plane Bubble Problem," SIAM Annual Meeting, Los Angeles, (July 1992).
204. Contributed (20 minutes): "On The Computation of The Rising Plane Bubble Problem," 7th IMACS International Conference on Computer Methods for Partial Differential Equations, Rutgers University, New Jersey, (June 1992).
205. Contributed (15 minutes): "A Fast Algorithm to Solve Non-Homogeneous Cauchy-Riemann Equations in the Complex Plane," SIAM Annual Meeting, Washington D.C., (July 1991).
206. **Invited** (one hour): "A Fast Numerical Method for Conformal and Quasiconformal Mappings," Invited one-hour colloquium talk, Mathematics Department, RPI, Troy, New York, (April 1991).
207. **Invited** (one hour): "A Fast Numerical Method for Quasiconformal Mappings," Invited one-hour colloquium talk, Mathematics Department, University of Michigan, Ann Arbor, Michigan, (April 1991).
208. Contributed (15 minutes): "Adaptive Computation of Porous Media Flow," SIAM Annual Meeting, Chicago, Illinois, (July 1990).
209. Contributed (15 minutes): "A New Method for One Dimensional Adaptive Grid Generation," SIAM Annual Meeting, Chicago, Illinois, (July 1990).
210. Contributed (15 minutes): "Solvability Condition for Overposed Inverse Problem in Compressible Flows," SIAM Annual Meeting, Chicago, Illinois, (July 1990).
211. **Invited** (30 minutes): "On Inverse Airfoil Design," AIAA 6th Applied Aerodynamics Conference, Williamsburg, Virginia, (June 1988).
212. **Invited** (one hour): "Efficient Methods For Inverse Problems," International Conference on Inverse Design Concepts and Optimization in Engineering Sciences-II (ICIDES-II), Pennsylvania State University, College Park, Pennsylvania, (Oct. 1987).
213. Contributed (20 minutes): "A Fast Approach to Designing Airfoils From Given Pressure Distribution in Compressible Flows," AIAA/AHS/ASEE Aircraft Design, Systems and Operations Meeting, St. Louis, Missouri, (Sep. 1987).
214. Contributed (20 minutes): "Instability and Its Control in Oil Recovery Problems," IMACS Conference on Partial Differential Equation, Bethlehem, Pennsylvania, (June 1987).
215. **Invited** (one hour): "On The Simulation of Heterogeneous Petroleum Reservoirs," Reservoir Simulation Conference, University of Minnesota, Minneapolis, Minnesota, (talk given by Co-author), (Jan. 1987).
216. **Invited** (one hour): "Fingering Instability in Simulation of Multilayered Flow in Porous Media and its Applications to Instability Control in Tertiary Oil Recovery," Annual Meeting of the American Physical Society, Fluid Dynamics Division, (Nov. 1986).
217. **Invited** (one hour): "Reservoir Simulation by the Method of Front Tracking," IFE/SSI seminar on Reservoir Description and Simulation with Emphasis On EOR, Oslo, Norway, (talk given by Co-author), (Sep. 1986).
218. **Invited** (one hour): "Exact and Approximate Inverse Methods for Airfoil Design," Applied Mathematics Seminar, Courant Institute, New York, (April, 1986).
219. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis And of Instability Control In Tertiary Oil Recovery," Department of Mathematics, Southern Methodist University, Dallas, Texas, (March 1986).
220. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis And of Instability Control In Tertiary Oil Recovery," Department of Mathematics, Northern Illinois University, Dekalb, Illinois, (March 1986).

221. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis And of Instability Control In Tertiary Oil Recovery," Department of Mathematics, Utah State University, Logan, Utah, (March 1986).
222. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis And of Instability Control In Tertiary Oil Recovery," Department of Mathematics, University of Wyoming, Laramie, Wyoming, (Feb. 1986).
223. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis And of Instability Control In Tertiary Oil Recovery," Department of Mathematics, University of Colorado, Denver, Colorado, (Febr. 1986).
224. **Invited** (one hour): "Polymer Floods: A Case Study of Nonlinear Wave Analysis and of Instability Control In Tertiary Oil Recovery," Department of Mathematics, Texas A&M University, College Station, Texas, (Feb. 1986).
225. Contributed (15 minutes): "The Exact Inverse Method for Subcritical Flows," Annual Meeting of the American Physical Society, Fluid Dynamics Division, (Nov. 1985).
226. Contributed (15 minutes): "Application of Tangent Gas Approximation," Annual Meeting of the American Physical Society, Fluid Dynamics Division, Providence, Rhode Island, (Nov. 1984).
227. **Invited** (one hour): "Inverse Design Methods for Aerofoils," Department of Applied Mathematics, Brown University, Providence. (April 1984).

10 Invited Participant in Various Research Workshops and Conferences

- Research Conference celebrating the 90th birthday of James Glimm at ICERM, Brown University, Providence, Sept 7-8, 2024.
- IPAM Workshop on the Occasion of 60th birthday celebration of IPAM Director: Russel Caflisch, IPAM, UCLA, Los Angeles, April 24- 28th, 2014
- NSF Workshop on Collaboration in Mathematical Geosciences, Crystal City-Washington, September 16-17, 2011