Yashar Mehmani

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Research Focus

My group focuses on the fundamental physics of flow and deformation in porous materials. Our goal is to bridge the controlling mechanisms rooted at the microscale to emergent behaviors observed at the macroscale. A core part of our activities is directed towards devising non-classical algorithms and experimental imaging techniques that probe microscale processes and translate useful insights into macroscale information. Our work is driven by applications of porous media in energy and the environment, including CO_2 sequestration, H_2 storage, geothermal energy, and manufactured devices such as fuel cells and batteries.

Education

Ph.D. | University of Texas at Austin | Petroleum and Geosystems Engineering Department | 2010-2015
　　Dissertation: "Modeling Single-Phase Flow and Solute Transport across Scales"
　　Advisor: Matthew T. Balhoff
　　GPA: 3.94/4.00

B.Sc. | Sharif University of Technology (Iran) | Chemical and Petroleum Engineering Department | 2005-2009
　　GPA: 18.02/20.00, Magna Cum Laude

Work Experience

Research:

The Pennsylvania State University | Energy and Mineral Engineering | 2021-present
Assistant Professor
- *Microscale computational fluid and solid mechanics in porous media*
- *Multiscale imaging and AI-assisted characterization of geomaterials*

Stanford University | Energy Resource Engineering | 2019-2020
Associate Research Scientist | Advisor: Hamdi Tchelepi
- *Multiscale methods for microscale solid mechanics in porous media*
- *Multiscale methods for microscale fluid dynamics in porous media*

Stanford University | Energy Resource Engineering | 2015-2019
Postdoctoral Researcher | Advisor: Hamdi A. Tchelepi
- *Multiscale imaging of hydro-thermo-mechanical properties of geomaterials (rocks/soil)*
- *Advanced algorithms of multiphase fluid dynamics for rapid fluid-microstructure optimization*
- *Reduced-complexity simulation of solute/particulate transport in porous media (filtration/contaminants)*

University of Texas at Austin | Petroleum and Geosystems Engineering | 2010-2015
Graduate Research Assistant | Advisor: Matthew T. Balhoff
- *Examined CO_2-mineral-water interactions in geologic CO_2 storage and its implications on leakage*
- *Developed hybrid multiscale methods for bridging micron to meter-scale reactive flow processes*
- *Increased predictive accuracy of reduced-complexity models of microscale solute transport*

Sharif University of Technology (Iran) | Chemical and Petroleum Engineering | 2009
Undergraduate Research Assistant | Advisor: Shahab Gerami
- *Designed methods for analyzing production rates of natural gas reservoirs*

Teaching:

The Pennsylvania State University | Energy and Mineral Engineering | Fall 2021
Instructor | Formation Evaluation (PNG 440W) | Undergraduate level

The Pennsylvania State University | Energy and Mineral Engineering | Spring 2021

Instructor | Flow in Porous Media (PNG 501) | Graduate level

Stanford University | Energy Resources Engineering | Falls 2018 & 2019
Teaching Co-Instructor | Advanced Reservoir Simulation (Energy 224)
- *Drafted course material*
- *Designed and delivered lectures in class*

Stanford University | Energy Resources Engineering | Winters 2016 & 2017
Teaching Co-Instructor | Multiphase Flow in Porous Media (Energy 221)
- *Drafted course material and homework assignments*
- *Designed and delivered lectures in class*

University of Texas at Austin | Petroleum and Geosystems Engineering **|** Summer 2011
Undergraduate Research Mentor | Computational Fluid Dynamics
- *Directed and mentored a team of three summer research interns*
- *Achieved project objectives ahead of schedule and one intern joined the group*

University of Texas at Austin | Petroleum and Geosystems Engineering | Spring 2010
Graduate Teaching Assistant | Numerical Methods and Programming (PGE 310)
- *Tutored, held office hours, graded homework for 60 undergraduate students*
- *Achieved student evaluation score of 4.2/5.0*

Industry:

MSi Kenny, Houston, Texas | Research and Development Intern | Summer 2013
- *Developed multiphase fluid flow model in (oil/gas) pipeline networks*

MSi Kenny, Houston, Texas | Research and Development Intern | Summer 2012
- *Developed high performance parallel computing (HPC) algorithms*

Refereed Publications

Published:

41. **Mehmani, Y.**, Li, K., "Multiscale Preconditioning of Stokes Flow in Complex Porous Geometries." ***Journal of Computational Physics***, 2025).

40. Khan, S.K., **Mehmani, Y.*** *(cor. author)*, "High-Order Multiscale Method for Elastic Deformation of Complex Geometries." ***Computer Methods in Applied Mechanics and Engineering***, (2024).

39. Bueno, N., Ayala, L., **Mehmani, Y.*** *(cor. author)*, "A generalized kinetic theory of Ostwald ripening in porous media." ***Advances in Water Resources***, (2024).

38. Li, K., Khan, S.M., **Mehmani, Y.*** *(cor. author)*, "Machine learning for preconditioning elliptic equations in porous microstructures: A path to error control." ***Computer Methods in Applied Mechanics and Engineering***, (2024).

37. Li, K., **Mehmani, Y.*** *(cor. author)*, "A multiscale preconditioner for crack evolution in porous microstructures: Accelerating phase-field methods." ***International Journal for Numerical Methods in Engineering***, (2024).

36. **Mehmani, Y.**, Xu, K., "A theory of diffusive bubble depletion in porous media." ***Advances in Water Resources,*** (*2024*).

35. Khan, S.M., Li, K., **Mehmani, Y.*** *(cor. author)*, "Order reduction of fracture mechanics in porous microstructures: A multiscale computing framework." ***Computer Methods in Applied Mechanics and Engineering***, (2024).

34. Bueno, N., Ayala, L., **Mehmani, Y.*** *(cor. author)*, "Ostwald ripening of multi-component bubbles in porous media: A theory and a pore-scale model of how bubble populations equilibrate." ***Advances in Water Resources,*** (*2023*).

33. Li, K., **Mehmani, Y.*** *(cor. author)*, "A pore-level multiscale method for the elastic deformation of fractured porous media." *Journal of Computational Physics*, (2023).

32. **Mehmani, Y.**, Li, K., "A multiscale preconditioner for microscale deformation of fractured porous media." *Journal of Computational Physics*, (2023).

31. Ghanbarian, B., **Mehmani, Y.**, Berkowitz, B., "Effect of pore-wall roughness and Peclet number of conservative solute transport in saturated porous media," *Water Resources Research*, (2023).

30. Yu, Y., Wang, C., Liu, J., Mao, S., **Mehmani, Y.**, Xu, K., "Bubble coarsening kinetics in porous media," *Geophysical Review Letters*, (2023).

29. Lee, J., Cook, O.J., Argüelles, A.P., **Mehmani, Y.*** *(cor. author)*, "Imaging geomechanical properties of shales with infrared light." *Fuel*, (2023).

28. **Mehmani, Y.**, Xu, K., "Capillary equilibration of trapped ganglia in porous media: a pore-network modeling approach." *Advances in Water Resources Research*, (2022).

27. **Mehmani, Y.**, Xu, K., "Pore-network modeling of Ostwald ripening in porous media: how do trapped bubbles equilibrate?" *Journal of Computational Physics* (2022).

26. **Mehmani, Y.**, Anderson, T., Wang, Y., Aryana, S.A., Battiato, I., Tchelepi, H.A., Kovscek, A.R., "Striving to translate shale physics across ten orders of magnitude: What have we learned?" *Earth Science Reviews* (2021).

25. **Mehmani, Y.**, Castelletto, N., Tchelepi, H.A., "Nonlinear convergence in contact mechanics: Immersed boundary finite volume." *Computer Methods in Applied Mechanics and Engineering*, (2021).

24. Wang, C., **Mehmani, Y.**, Xu, K., "Capillary equilibrium of bubbles in porous media." *Proceedings of the National Academy of Sciences of the United States of America*, (2021).

23. **Mehmani, Y.**, Castelletto, N., Tchelepi, H.A., "Multiscale formulation of frictional contact mechanics at the pore scale." *Journal of Computational Physics*, (2021).

22. Yuan, Q., **Mehmani, Y.**, Burnham, A., Lapene, A., Wendebourg, J., Tchelepi, H.A., "Scaling analysis of the coupled compaction, kerogen conversion, and petroleum expulsion during geological maturation." *Journal of Petroleum Science and Engineering*, (2020).

21. Xu, K., **Mehmani, Y.**.* *(cor. author)*, Shang, L., Xiong, Q., "Gravity-induced bubble ripening in porous media and its impact on capillary trapping stability." *Geophysical Research Letters*, (2019).

20. Guo, B., **Mehmani, Y.**, Tchelepi, H.A., "Multiscale formulation of compressible pore-scale Darcy-Stokes flow." *Journal of Computational Physics*, (2019).

19. **Mehmani, Y.**, Tchelepi, H.A., "Multiscale formulation of two-phase flow at the pore scale." *Journal of Computational Physics*, (2019).

18. **Mehmani, Y.**, Tchelepi, H.A., "Multiscale computation of pore-scale fluid dynamics: single-phase flow." *Journal of Computational Physics*, (2018).

17. **Mehmani, Y.**, Tchelepi, H.A., "Minimum requirements for predictive pore-network modeling of solute transport in micromodels." *Advances in Water Resources*, (2017).

16. **Mehmani, Y.**, Burnham, A.K., Vanden Berg, M.D., Tchelepi, H.A., "Quantification of organic content in shales via near-infrared imaging: Green River Formation." *Fuel*, (2017).

15. **Mehmani, Y.**, Burnham, A.K., Tchelepi, H.A., "From optics to upscaled thermal conductivity: Green River oil shale." *Fuel*, (2016).

14. **Mehmani, Y.**, Burnham, A.K., Vanden Berg, M.D., Gelin, F., Tchelepi, H., "Quantification of kerogen content in organic-rich shales from optical photographs." *Fuel*, (2016).

13. **Mehmani, Y.**, Balhoff, M.T., "Eulerian network modeling of longitudinal dispersion." ***Water Resources Research***, (2015).

12. **Mehmani, Y.**, Balhoff, M.T., "Mesoscale and hybrid models of fluid flow and solute transport." ***Reviews in Mineralogy and Geochemistry*** (***book chapter***), (2015).

11. Mehmani, A., **Mehmani, Y.**, Prodanović, M., Balhoff, M.T. "A forward analysis on the applicability of tracer breakthrough profiles in revealing the pore structure of tight gas sandstone and carbonate rocks." ***Water Resources Research***, (2015).

10. Yang, X., **Mehmani, Y.**, Perkins, W.A., Pasquali, A., et al. "Intercomparison of 3D pore-scale flow and solute transport simulation methods", ***Advances in Water Resources***, (2015).

9. **Mehmani, Y.**, Balhoff, M.T., "Generalized semi-analytical solution of advection-diffusion-reaction in finite and semi-infinite cylindrical ducts." ***Int. Journal of Heat and Mass Transfer***, (2014).

8. **Mehmani, Y.**, Oostrom, M., Balhoff, M.T., "A streamline splitting pore-network approach for computationally inexpensive and accurate simulation of species transport in porous media," ***Water Resources Research***, (2014).

7. Oostrom, M., **Mehmani, Y.**, Romero-Gomez, P., Tang, Y., Liu, H., Yoon, H., Kang, Q., et al. "Pore-scale and continuum simulations of solute transport micromodel benchmark experiments." ***Computational Geosciences***, (2014).

6. Altman, S.J., Aminzadeh-Goharrizi, B., … **Mehmani, Y.**, … (*alphabetical order*) "Chemical and hydrodynamic mechanisms for long-term geological carbon storage." ***The Journal of Physical Chemistry C***, (2014).

5. **Mehmani, Y.**, Balhoff, M.T., "Bridging from pore to continuum: a hybrid mortar domain decomposition framework for subsurface flow and transport." ***SIAM Journal of Multiscale Modeling and Simulation***, (2014).

4. **Mehmani, Y.**, Sun, T., Balhoff, M.T., Eichhubl, P., Bryant, S., "Multiblock pore-scale modeling and upscaling of reactive transport: application to carbon sequestration." ***Transport in Porous Media***, (2012).

3. Sun, T., **Mehmani, Y.**, Balhoff, M.T. "Hybrid multiscale modeling through direct substitution of pore-scale models into near-well reservoir simulators." ***Energy & Fuels***, (2012).

2. Sun, T., **Mehmani, Y.**, Bhagmane, J., Balhoff, M.T., "Pore to continuum upscaling of permeability in heterogeneous porous media using mortars." ***Int. Journal of Oil, Gas and Coal Technology***, (2012).

1. Balhoff, M., Sanchez-Rivera, D., Kwok, A., **Mehmani, Y.**, Prodanović, M., "Numerical algorithms for network modeling of yield stress and other non-Newtonian fluids in porous media." ***Transport in porous media***, (2012).

Published datasets & archives:

2. **Mehmani, Y.**, Tchelepi, H.A., "PNM vs. DNS intercomparison dataset for transport in micromodels." ***Digital Rocks Portal***, (2017).

1. **Mehmani, Y.**, "Wrinkle-free interface compression for two-phase flow simulations." ***arXiv***, (2018).

Conference proceedings:

1. **Mehmani, Y.**, Burnham, A.K., Vanden Berg, M.D., Tchelepi, H.A., "Multiscale characterization of spatial heterogeneity of petroleum source rocks via near-infrared spectroscopy." Presented at the SPE/AAPG/SEG ***Unconventional Resources Technology Conference***, Austin, Texas, USA, July 2017. DOI: 10.15530/URTEC-2017-2690272. (2017)

Honors and Awards

- Selected as the Penn State nominee for the 2023 Blavatnik National Awards in Phys. Sci. & Eng. (2022)
- Recipient of the National Science Foundation Faculty Early Career Development (NSF CAREER) award (2022)
- Recipient of the American Chemical Society (ACS) Doctoral New Investigator (DNI) award (2021)
- Center for Frontiers of Subsurface Energy Security award for most 1st-authored publications (Jan 2017)
- Two Graduate Student Professional Development Awards, UT Austin (May and Dec 2014)

- 2nd place in departmental Research Showcase event, UT Austin (2014)
- 2nd place in Gulf Coast regional SPE student paper contest, PhD division (2014)
- Graduate and Industry Networking (GAIN) Shell award for research and presentation (2014)
- Recipient of School of Engineering Fellowship, UT Austin (2013-2014)
- Recipient of Fancher Fellowship, UT Austin (2010-2011)
- Merit-based acceptance into M.Sc. in Petroleum Engineering (declined), Sharif University of Technology (2008)

Presentations (subset)

Oral presentations:

1. "Understanding and computing of fracture mechanics in porous media." **(invited)**
   California Institute of Technology, Pasadena, Jan 2024.
2. "Preconditioners built by machine learning for elliptic equations on porous microstructure."
   Computational Methods in Water Resources (CMWR), Tucson, Arizona, Oct 2024.
3. "Multiscale preconditioning of microscale deformation of fractured porous media." **(invited)**
   SIAM conference on Mathematical and Computational Issues in the Geosciences, Bergen, Norway, June 2023.
4. "Using infrared light to map the geomechanical properties of shales."
   American Geophysical Union, Chicago, Dec 2022.
5. "Translating fluid and solid mechanics across scales in porous media." **(invited)**
   Columbia University, Earth and Environmental Engineering, New York, Oct 2022.
6. "Accelerating computations for fluid and solid mechanics in porous media." **(invited)**
   University of Tulsa, Petroleum Engineering Department, Tulsa, Sep 2022.
7. "Microscale computation of fluid and solid mechanics in porous media." **(invited)**
   Auburn University, CO$_2$ Utilization & Storage initiative, online, Jan 2022.
8. "Microscale computation of fluid and solid mechanics in porous media." **(invited)**
   University of Wyoming, Petroleum Engineering Department, online, Sep 2021.
9. "Equilibration of trapped bubbles through Ostwald ripening: a pore-network approach." **(invited)**
   American Geophysical Union (AGU) conference, New Orleans, USA, Dec 2021.
10. "Newton convergence in contact mechanics: immersed boundary finite volume." **(invited)**
    SIAM conference on Mathematical and Computational Issues in the Geosciences, COVID online, June 2021.
11. "Pore-network modeling of bubble ripening in porous media."
    International Society for Porous Media (InterPore) Conference, COVID online, May 2021.
12. "Multiscale computation of pore-scale geomechanics."
    International Society for Porous Media (InterPore) Conference, COVID online, August 2020.
13. "A multiscale formulation of multiphase flow at the pore scale." **(invited)**
    SIAM conference on Mathematical and Computational Issues in the Geosciences, Houston, USA, March 2019.
14. "Multiscale computation of multiphase fluid dynamics at the pore scale." **(invited)**
    SIAM conference on Computational Science and Engineering, Washington, USA, March 2019.
15. "Multiscale computation of pore-scale fluid dynamics." **(invited)**
    ExxonMobil Corporate Strategic Research Laboratory, New Jersey, USA, June 2018.
16. "Multiscale computation of pore-scale fluid dynamics."
    International Society for Porous Media (InterPore) Conference, New Orleans, USA, May 2018.
17. "Multiscale computation of pore-scale fluid dynamics."
    Massachusetts Institute of Technology (Total shale workshop), Boston, USA, March 2018.
18. "Reduced-order direct numerical simulation of solute transport in porous media."
    American Physical Society (APS), Division of Fluid Dynamics, Denver, USA, Nov 2017.
19. "Multiscale characterization of spatial heterogeneity of petroleum source rocks via near-infrared spectroscopy."
    Unconventional Resources Technology Conference (URTeC), Austin, USA, July 2017.
20. "Multiscale imaging of unconventional rock properties." **(invited)**
    University of Texas at Austin, Austin, USA, April 2017.
21. "A novel optical method for quantifying geological properties of oil shale across scales."
    Computational Methods in Water Resources (CMWR), Toronto, Canada, June 2016.
22. "Hybrid mortar domain decomposition for single-phase flow and solute transport."
    Computational Methods in Water Resources (CMWR), Toronto, Canada, June 2016.

23. "Multiscale characterization of spatial heterogeneity from optical photographs of oil shale."
International Society for Porous Media (InterPore) Conference, Cincinnati, USA, May 2016.

24. "Multiscale characterization of geologic properties of Green River oil shale."
35th Oil Shale Symposium (OSS), Salt Lake City, USA, Oct 2015.

25. "Computationally inexpensive incorporation of solute transport physics into pore-network models."
American Geophysical Union (AGU), San Francisco, USA, Dec 2014.

26. "Flow and solute transport in porous media: from the sub-pore to the continuum." **(invited)**
Massachusetts Institute of Technology (*Juanes Group*), Boston, USA, Oct 2014.

27. "Bridging from pore to continuum: a hybrid mortar domain decomposition framework for subsurface flow and transport." *International Society for Porous Media (InterPore) Conference*, Milwaukee, USA, May 2014.

28. "Multiscale modeling of reactive transport with applications to CO_2 sequestration."
Center for Subsurface Modeling (director: Mary Wheeler), Austin, USA, Dec 2012.

29. "A multiscale approach to upscaling multi-species reactive transport from pore to macro scale with applications to CO_2 sequestration." *Computational Methods in Water Resources (CMWR)*, Urbana-Champaign, USA, June 2012.

Poster presentations:

1. "Multiscale Preconditioning of Stokes Flow in Porous Media: How Approximate Models can Accelerate Direct Simulations." *American Geophysical Union (AGU)*, Washington D.C., Dec 2024.
2. "Bubble depletion by ripening in porous media: A continuum theory."
Gordon Research Conference (GRC), Maine, USA, July 2024.
3. "Diffusive evolution of partially miscible ganglia in porous media: a pore-network approach."
American Geophysical Union (AGU), Chicago, Dec 2022.
4. "Nonlinear convergence in contact mechanics."
American Geophysical Union (AGU), COVID online, Dec 2020.
5. "Multiscale computation of pore-scale fluid dynamics."
Gordon Research Conference (GRC), Maine, USA, July 2018.
6. "Near-infrared imaging for spatial mapping of organic content in petroleum source rocks."
American Geophysical Union (AGU), New Orleans, USA, Dec 2017.
7. "Multiscale characterization of petroleum source rocks."
Gussow Conference, Canadian Society of Petroleum Geologists (CSPG), Banff, Canada, Oct 2017.
8. "Pore-network modeling vs. direct numerical simulation: a comparative study."
American Geophysical Union (AGU), San Francisco, USA, Dec 2016.
9. "Multiscale characterization of geological properties of oil shale."
American Geophysical Union (AGU), San Francisco, USA, Dec 2015.
10. "Accurate and efficient streamline-splitting approach for modeling of transverse dispersion at the pore scale."
Gordon Research Conference (GRC), Maine, USA, July 2014.
11. "Computationally inexpensive and accurate simulation of transverse dispersion at the pore scale."
International Society for Porous Media (InterPore) Conference, Milwaukee, USA, May 2014.
12. "A streamline splitting pore-network approach for computationally inexpensive and accurate simulation of species transport in porous media." *American Geophysical Union (AGU)*, San Francisco, USA, Dec 2013.
13. "Bridging spatial scales: investigation of leakage in a natural CO_2 seep."
12th Annual Conference on Carbon Capture, Utilization, and Storage (CCUS), Pittsburgh, USA, May 2013.

Professional Activities

Journal Reviewer:

- Journal of Computational Physics
- Physical Review E
- Geophysical Review Letters
- Computational Geosciences
- Transport in Porous Media
- Advances in Water Resources
- Water Resources Research
- AAPG Bulletin
- Applied Mathematical Modeling
- Journal of Natural Gas Science and Engineering
- Journal of Petroleum Science and Engineering
- Journal of Infrared Physics & Technology
- Fuel
- Energy & Fuels

Proposal Writing/Reviewing:

- NSF, Hydrological Sciences (*reviewer*)
- NSERC, Discovery Grant, Canada (*reviewer*)
- Advanced Scientific Computing Research (DOE/ASCR) (*reviewer*)
- American Chemical Society Petroleum Research Fund (*reviewer*)
- Internal proposal to Total S.A., Shale Spectroscopy (*author*)
- SLAC National Accelerator Laboratory, Beam Time (*co-author*)

Memberships:

- American Geophysical Union (AGU)
- American Physical Society (APS)
- International Society for Porous Media (InterPore)
- Society of Petroleum Engineers (SPE)
- Society for Industrial and Applied Mathematics (SIAM)

Professional Service:

- **Technical Committee**, 8th Biot Conference on Poromechanics (2025)
- (*with* Xiaojing (Ruby) Fu, *CalTech,* Bo Guo, *University of Arizona)*
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2024)
  (*with* Lazaro Perez, *Oregon State University,* Kevin Roche, *Boise State University,* Nick Engdahl, *Washington State University*)
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2024)
  (*with* Bo Guo, *University of Arizona,* Wen Song, *University of Texas at Austin,* Vitalii Starchenko, *Oak Ridge National Laboratory*)
- **Technical Committee Member**, Computational Methods in Water Resources (CMWR) conference (2024)
  (*with* Xiaojing (Ruby) Fu, *CalTech,* Julien Maes, *Heriot-Watt University,* Sidian Chen, *Stanford University)*
- **Session Convener,** American Geophysical Union (AGU) conference, Hydrology (2023)
  (*with* Bo Guo, *University of Arizona,* Benzhong (Robin) Zhao, *University of McMaster*, Lauren Beckingham, *Auburn University*)
- **Minisymposium Convener**, SIAM Mathematical and Computational Issues in the Geosciences (2023), Session on "Pore-scale modeling."
- **Minisymposium Convener,** Interpore (2023) Conference, Session on "Pore-scale modeling"
  (*with* Stephane Zaleski, *Sorbonne Universite*, Ke Xu, *Peking University*, Bo Guo, *University of Arizona,* Moran Wang, *Tsinghua*)
- **Session Convener,** American Geophysical Union (AGU) conference, Hydrology (2022)
  (*with* Bo Guo, *University of Arizona,* Xiaojing (Ruby) Fu, *Caltech*, Veronica Morales, *UC Davis*)
- **Minisymposium Convener,** Interpore (2022) Conference, Session on "Pore-scale modeling" (*with* Bo Guo, *University of Arizona*, Ke Xu, *Peking University*, Yongfei Yang, *China University of Petroleum*, Stephane Zaleski, *Sorbonne Universite*)
- **Session Convener,** American Geophysical Union (AGU) conference, Hydrology (2021)
  (*with* Bo Guo, *University of Arizona*, Francisco Carrillo, *Princeton University*, Hamdi Tchelepi, *Stanford University*)
- **Minisymposium Convener,** Interpore (2021) Conference, Session on "Pore-scale modeling" (*with* Stephane Zaleski, *Sorbonne Universite*, Ke Xu, *Peking University*, Oleg Iliev, *Fraunhofer TWM*)
- **Guest Editor,** Transport in Porous Media, Special Issue, "Interfacial phenomena in multiphase systems at the pore scale", (2020).
- **Session Convener,** American Geophysical Union (AGU) conference, Hydrology (2020) (*with* Bo Guo, *University of Arizona*, Francisco Carrillo, *Princeton University*, Hamdi Tchelepi, *Stanford University*
- **Minisymposium Convener,** Interpore (2020) Conference, Session on "Interfacial phenomena in multiphase systems" (*with* Pacelli Zitha *TU Delft*, Ke Xu, *MIT*, Grigori Chapiro, *Universidade Federal de Juiz de Fora*, Hai Sun, *China University of Petroleum East China*, Bo Guo, *University of Arizona*)
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2019)
  (*with* Francisco J. Carrillo, *Princeton University,* Qinhong Hu, *UT Arlington*, John R. Nimmo, *USGS*)

- **Minisymposium Convener**, SIAM Mathematical and Computational Issues in the Geosciences (2019) (*with* Nicola Castelletto, *Lawrence Livermore National Lab*)
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2018) (*with* Bo Guo, *University of Arizona*, Hamdi Tchelepi, *Stanford University*)
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2017) (*with* Bo Guo, *University of Arizona*, Farzan Kazemifar, *Sacramento State University*, Yaofa Li, *Notre Dame*)
- **Session Convener**, American Geophysical Union (AGU) conference, Hydrology (2014) (*with* Qinjun Kang, *Los Alamos National Lab*, Mart Oostrom, *Pacific Northwest National Lab* (now Intera Inc.), Christian Huber, *Georgia Institute of Technology*)
- **Organizer,** research meetings for the Stanford-Total Enhanced Modeling of Source Rock (STEMS) research group (3 faculty members, 8 postdocs, 7 graduate students) (2016)
- **Departmental Representative**, Graduate Student Assembly (GSA), UT Austin, (2012-2013)

Skills

Computer

- **Programming:** FORTRAN, C/C++, MATLAB, Python, Mathematica, Pascal
- **Parallel Computing:** MPI, OpenMP, MATLAB Parallel Programming Toolbox
- **Fluid Physics:** OpenFOAM, COMSOL, Paraview, ImageJ
- **Miscellaneous:** LaTex, Microsoft Office Suite, AutoCAD, CMG, PVTsim, Reed Hycolog, Visual Studio
- **Operating Systems:** Linux, Windows, Macintosh

Language

- English (fluent), German (fluent), Farsi (fluent), Azerbaijani (fluent), Turkish (conversational), Arabic (basic)