Stanford

Hamdi Tchelepi

Professor of Energy Resources Engineering

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Energy Resources Engineering
- Affiliate, Precourt Institute for Energy
- Member, Institute for Computational and Mathematical Engineering (ICME)

ADMINISTRATIVE APPOINTMENTS

- Chair, Department of Energy Resources Engineering (ERE), Stanford University, (2018- present)
- Professor, Energy Resources Engineering, Stanford University, (2013- present)
- Co-Director, CEES (Center for Computational Earth & Environmental Sciences), Stanford University, (2010-2018)
- Associate Professor, Energy Resources Engineering, Stanford University, (2003-2013)
- Research Positions, including Staff Research Scientist, Chevron Energy Technology Company, (1994-2003)

HONORS AND AWARDS

- Distinguished Member, SPE (2020)
- Robert Earll McConnell Award, Joint SPE and AIME Societies (2020)
- President's Individual Achievement Award, Successful Completion of Phase 1 of the Intersect Project, ChevronTexaco & Schlumberger (2003)
- Nominee for the Council of Graduate Schools Distinguished Dissertation Award, Stanford University (1994)
- Edmund W. Littlefield Fellow, Edmund W. Littlefield Fellowship (1993-1994)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Editorial Board, SIAM Multiscale Modeling & Simulation, SIAM (2014 - present)
- Chair, Gordon Conference on "Flow and Transport in Permeable Media", Bates College, Maryland, Gordon Research Conferences (2014 - 2014)
- Vice-Chair, Gordon Research Conference on Flow in Permeable Media, Switzerland, Gordon Research Conference, Switzerland (2012 - 2012)
- Chair, SPE Reservoir Simulation Symposium, The Woodlands, Texas (2011 - 2011)
- Invited Speaker, Stanford/Aramco/KFUPM Meeting on Research Collaboration, Dhahran, Saudi Arabia (2011 - 2011)
- Lecturer, Short Course on Reservoir Simulation, ENI, Milan, Ente Nazionale Idrocarburi (ENI) (2011 - 2011)
- Co-Director: Center for Computational Earth & Environmental Science (CEES), Stanford University (2010 - present)
- Co-Director: Stanford Earth Sciences Algorithms & Architecture Initiative (SESAAI), Stanford University (2010 - present)
- Editorial Board, Journal of Computational Science (2010 - present)
- Instructor, Short Course on Reservoir Simulation, ENI (2010 - 2010)

- Invited Speaker, Flow and Transport in Permeable Media, Bates College, Maine, Gordon Research Conference (2010 - 2010)
- Invited Speaker, Computational Geoscience Seminar Series, MIT, MA (2010 - 2010)
- Invited Speaker, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA (2010 - 2010)
- Board Member, SPE Digital Energy Technical Section (2009 - 2011)
- Keynote Speaker, Monte Verita, Switzerland, (March), International Conference on Preferential and Unstable Flow in Porous Media (2009 - 2009)
- Keynote Speaker, Svalbard, Norway (August), Workshop on Modeling and Risk Assessment of Geological Storage of CO2 (2009 - 2009)
- Guest Co-Editor, Special Issue on \Multiscale, Computational Geosciences (2008 - 2008)
- Instructor, Short Course on Reservoir Simulation, ENI, Milan, Italy (2008 - 2008)
- Invited Speaker, Civil & Environmental Engineering,, USC, Los Angeles, CA (2008 - 2008)
- Invited Speaker, Petroleum Institute, Abu-Dhabi, UAE, Petroleum Institute (2008 - 2008)
- Invited Speaker, SPE Section & Aramco Advanced Research Center, Dhahran, Saudi Arabia, Society of Petroleum Engineers (2008 - 2008)
- Keynote Speaker, Computational Methods in Water Resources (CMWR) (2008 - 2008)
- Associate Director, Center for Computational Earth & Environmental Science (CEES), Stanford University (2007 - 2010)
- Invited Panel Member, SIAM Conf., Computational Sci. & Engineering, CS & E Education, Costa Mesa, Society for Industrial and Applied Mathematics (2007 - 2007)
- Invited Participant: DOE Basic Energy Sciences (BES): Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems, Feb., DOE Basic Energy Sciences (BES) (2007 - 2007)
- Invited Speake, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia (2007 - 2007)
- Invited Speaker, Workshop on Discretization and Scale-up Methods, Princeton University, Princeton, NJ (2007 - 2007)
- Invited Speaker, ENI, Milan, Italy (2007 - 2007)
- Invited Speaker, ExxonMobil Research Lab, Houston, TX., ExxonMobil Research Lab (2007 - 2007)
- Invited Speaker, Inaugural Conference on Computational Methods in Energy and Environmental Research (CMEER), July, Beijing, China, Computational Methods in Energy and Environmental Research (CMEER) (2007 - 2007)
- Invited Speaker, Lecture Series, Aramco Advanced Research Center, Dhahran, Saudi Arabia, Aramco Advanced Research Center (2007 - 2007)
- Invited Speaker, Structural Engineering and Geomechanics Seminar, Stanford University (2007 - 2007)
- Lecturer, Short Course on Reservoir Simulation, Milan, Italy, ENI (2007 - 2007)
- Co-Director, Stanford Reservoir Simulation Affiliates Program (SUPRI-B), Stanford University (2006 - present)
- Member, SPE Continuing Education Committee (2006 - 2010)
- Guest editor, Special issue, ìMultiscale methods for heterogeneous porous media, Computational Geosciences Journal (2006 - 2006)
- Invited Panelist, Meeting on Technology Impact on EOR, November, National Petroleum Council (NPC) (2006 - 2006)
- Organizing Committee, SPE Reservoir Simulation Symposium (2006 - 2006)
- Organizing Committee Member, Modeling Flow in Permeable Media, Gordon Research Conference (2006 - 2006)
- Editorial Board, Transport in Porous Media (2005 - present)
- Advisory Panel, Center for Computational Earth & Environmental Sciences (CEES), Stanford University (2005 - 2010)
- Co-Chair, Heriot-Watt Forum, Stanford University (2005 - 2005)
- Co-taught Short Course on Reservoir Simulation, Stanford University (2005 - 2005)
- Instructor, Short Course on Reservoir Simulation, Milan, Italy, ENI (2005 - 2005)
- Invited Presenter, Institute for Computational and Mathematical Engineering, Stanford University (2005 - 2005)
- Invited Speaker, International Forum on Reservoir Simulation Stresa, Italy (2005 - 2005)
- Invited Speaker, CIMMS/IPAM Workshop on Multiscale Modeling and Computation, Caltech, Pasadena, CA, CIMMS/IPAM (2005 - 2005)
- Invited Speaker, Fluid Mechanics Seminar, Mechanical Engineering Department, UC Santa Barbara (2005 - 2005)

- Organizing Committee, SPE Reservoir Simulation Symposium (2005 - 2005)
- Graduate Admissions Committee, Energy Resources Engineering Department, Stanford University (2004 - present)
- Co-taught Short Course on reservoir simulation, Stanford University (2004 - 2004)
- Invited Presenter, School of Petroleum Engineering and Geological Engineering, University of Oklahoma (2004 - 2004)
- Editorial board, Vadose Zone Journal (2003 - 2006)
- Co-taught Short Course on Reservoir Simulation (August), Stanford University (2003 - 2003)
- Invited Speaker, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA (November), Lawrence Berkeley National Laboratory (2003 - 2003)
- Invited speaker, SPE Forum on Reservoir Simulation, Park City, Utah (July), Society of Petroleum Engineers (2003 - 2003)
- Organizing Committee, SPE Reservoir Simulation Symposium (2003 - 2003)
- Invited speaker, Fundamental Problems in Reservoir Simulation & Optimization, Oxford (April), Schlumberger & Oxford University (2002 - 2002)
- Organizing Committee Member, Modeling Flow in Permeable Media, Gordon Research Conference (2002 - 2002)
- Invited plenary speaker, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Colorado (June), Society for Industrial and Applied Mathematics (2001 - 2001)
- Editorial Board, SPE Journal (2000 - present)
- Invited speaker, Gordon Research Conference on Flow in Permeable Media, New Hampshire (August), Gordon Research Conference (2000 - 2000)
- Invited speaker, Institute of Mathematics & its Applications, Minnesota (February), Institute of Mathematics (IMA) (2000 - 2000)
- Member, SPE, AGU, APS, SIAM (1999 - present)
- Program Committee Member of the Fifth SIAM Conference on Mathematical and Computational Isues in the Geosciences, Society for Industrial and Applied Mathematics (1999 - 1999)

PROFESSIONAL EDUCATION

- Ph.D., Stanford University , Petroleum Engineering (1994)
- M.S., King Fahd University , Petroleum Engineering (1988)
- B.S., University of Petroleum and Minerals , Petroleum Engineering (1985)

PATENTS

- Moncorge, A. and Tchelepi, H.A.. "United States Patent 8,412,502 B2 System and Method for Performing Oilfield Simulation Operations", Schlumberger-Total, Apr 2, 2013
- Lee, S.H., Zhou, H., and Tchelepi, H.A.. "United States Patent 8,346,523 B2 Indirect-Error-Based Dynamic Upscaling of Multi-Phase Flow in Porous Media", Chevron-Schlumberger, Jan 1, 2013
- Lee, S. H., Zhou, H., and Tchelepi, H. A.. "United States Patent 8,204,726 Multi-Scale Method for Multi-Phase Flow in Porous Media", Schlumberger-Chevron, Jun 19, 2012
- Moncorge, A. and Tchelepi, H.A.. "United States Patent 7,877,246 B2 System and Method for Performing Oilfield Simulation Operations", Schlumberger-Total, Jan 25, 2011
- J. R. Wallis, Hamdi Tchelepi. "United States Patent 7,684,967 Apparatus, Method and System for Improved Reservoir Simulation Using an Algebraic Cascading Class Linear Solver", Mar 23, 2010
- J. R. Wallis, H. A. Tchelepi, and H. Cao. "United States Patent 7,516,056 B2 Apparatus, Method and System for Improved Reservoir Simulation using a Multiplicative Overlapping Schwarz Preconditioning for Adaptive Implicit Linear Systems", Schlumberger Technology Corporation, Apr 7, 2009
- P. Jenny, Hamdi Tchelepi, S.H. Lee. "United States Patent 7,505,882 B2 Stable Method and Apparatus for Solving S-Shaped Non-Linear Functions Utilizing Modified Newton-Raphson Algorithms", Mar 1, 2009
- Jenny, P., Lee, S.H., and Tchelepi, H.A.. "United States Patent 6,823,297 B2 Multi-Scale Finite-Volume Method for use in Subsurface Flow Simulation", Chevron-Schlumberger, Nov 23, 2004
- P. Jenny, S.H. Lee, Hamdi Tchelepi. "United States Patent 2004/0176937A1 Multiscale Finite Volume Method for Use in Subsurface Flow Simulation", Sep 5, 2004

LINKS

- SUPRI-B: Reservoir Simulation: https://supri-b.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

I am interested in numerical simulation of flow and transport processes in natural porous media. Application areas include reservoir simulation and subsurface CO2 sequestration. Current research activities include (1) modeling unstable miscible and immiscible flow in heterogeneous formations, (2) developing multiscale formulations and scalable solution algorithms for multiphase flow in large-scale subsurface systems, and (3) developing stochastic formulations for quantification of the uncertainty associated with predictions of flow and transport in large subsurface formations.

Teaching

I teach courses on multiphase flow in porous media and numerical reservoir simulation.

Professional Activities

President's Individual Achievement Award, sponsored by Chevron and Schlumberger, for successful completion of the Intersect Project (next generation reservoir simulator), 2003; Co-Director, Stanford Reservoir Simulation Affiliates Program (SUPRI-B), 2006-present; Editorial board, Transport in Porous Media, 2005-2010; advisory panel, Center for Computational Earth and Environmental Science, 2005-present; graduate admissions committee, Department of Energy Resources Engineering, 2004-2017; Editorial board, SPE Journal, 2000-present; member, SPE, AGU, APS, SIAM, 1999-present; Edmund W. Littlefield Fellow, 1993-94

Teaching

COURSES

2020-21

- ERE Master's Graduate Seminar: ENERGY 351 (Spr)
- ERE PhD Graduate Seminar: ENERGY 352 (Spr)
- Fundamentals of Multiphase Flow: ENERGY 121, ENERGY 221 (Win)
- Reservoir Simulation: ENERGY 223 (Win)

2019-20

- Advanced Reservoir Simulation: ENERGY 224 (Aut)
- Fundamentals of Multiphase Flow: ENERGY 121, ENERGY 221 (Win)
- Reservoir Simulation: ENERGY 223 (Win)

2018-19

- Advanced Reservoir Simulation: ENERGY 224 (Aut)
- Fundamentals of Multiphase Flow: ENERGY 121, ENERGY 221 (Win)
- Reservoir Simulation: ENERGY 223 (Win)

2017-18

- Advanced Reservoir Simulation: ENERGY 224 (Aut)
- Fundamentals of Multiphase Flow: ENERGY 121, ENERGY 221 (Win)
- Reservoir Simulation: ENERGY 223 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Ayaka Abe, Laura Froute, Halldora Gudmundsdottir, Bazyli Klockiewicz, Hannah Lu

Postdoctoral Faculty Sponsor

Jacques Franc

Doctoral Dissertation Advisor (AC)

Sebastian Bosma, Ricardo Deucher, Sergey Klevtsov, Timothy Yeo

Master's Program Advisor

Rasim Hasanzade, Nnamdi Jacob, Sohail Waziri, youssef aitousarrah

Doctoral Dissertation Co-Advisor (AC)

HYUNG JUN YANG, Jie Yang

Doctoral (Program)

Jaewoo An, Cedric Fraces Gasmi, Hussein Kassem, Farzaneh Rajabi, Yuan Tian, weiyu li

Publications

PUBLICATIONS

- **Reduced method for rapid multiphase isenthalpic flash in thermal simulation** *CHEMICAL ENGINEERING SCIENCE*
  Connolly, M., Pan, H., Imai, M., Tchelepi, H. A.
  2021; 231
- **Uncertainty Space Expansion: A Consistent Integration of Measurement Errors in Linear Inversion** *SPE JOURNAL*
  Likanapaisal, P., Tchelepi, H. A.
  2020; 25 (6): 3317–31
- **Algebraically stabilized Lagrange multiplier method for frictional contact mechanics with hydraulically active fractures** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Franceschini, A., Castelletto, N., White, J. A., Tchelepi, H. A.
  2020; 368
- **Wettability and capillary effects: Dynamics of pinch-off in unconstricted straight capillary tubes** *PHYSICAL REVIEW E*
  Esmaeilzadeh, S., Qin, Z., Riaz, A., Tchelepi, H. A.
  2020; 102 (2)
- **Finite-volume simulation of capillary-dominated flow in matrix-fracture systems using interface conditions** *COMPUTATIONAL GEOSCIENCES*
  Alali, A. H., Hamon, F. P., Mallison, B. T., Tchelepi, H. A.
  2020
- **Two-phase multiscale numerical framework for modeling thin films on curved solid surfaces in porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Qin, Z., Esmaeilzadeh, S., Riaz, A., Tchelepi, H. A.
  2020; 413
- **Continuous Relative Permeability Model for Compositional Simulation** *TRANSPORT IN POROUS MEDIA*
  Khebzegga, O., Iranshahr, A., Tchelepi, H.
  2020
- **Simulation of mineral dissolution at the pore scale with evolving fluid-solid interfaces: review of approaches and benchmark problem set** *COMPUTATIONAL GEOSCIENCES*
  Molins, S., Soulaine, C., Prasianakis, N. I., Abbasi, A., Poncet, P., Ladd, A. C., Starchenko, V., Roman, S., Trebotich, D., Tchelepi, H. A., Steefel, C. I.
  2020
- **Cell-centered finite-volume method for elastic deformation of heterogeneous media with full-tensor properties** *JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS*
  Terekhov, K. M., Tchelepi, H. A.

2020; 364

- **Uncertainty Propagation for Compositional Flow Using a Probability Distribution Method** *Transport in Porous Media*
  Fuks, O., et al
  2020
- **Method of distributions for quantification of geologic uncertainty in flow simulations** *Method of distributions for quantification of geologic uncertainty in flow simulations*
  Yang, H. J., Boso, F., Tchelepi, H. A., Tartakovsky, D. M.
  2020
- **Wettability and capillary effects: Dynamics of pinch-off in unconstricted straight capillary tubes.** *Physical review. E*
  Esmaeilzadeh, S. n., Qin, Z. n., Riaz, A. n., Tchelepi, H. A.
  2020; 102 (2-1): 023109
- **Scaling analysis of coupled compaction, kerogen conversion, and petroleum expulsion during geological maturation** *Journal of Petroleum Science and Engineering*
  Yuan, Q., Mehmani, Y., Burnham, A. K., Lapene, A., Wendebourg, J., Tchelepi, H. A.
  2020; 192
- **Pore-scale study of water salinity effect on thin-film stability for a moving oil droplet.** *Journal of colloid and interface science*
  Abu-Al-Saud, M. O., Esmaeilzadeh, S. n., Riaz, A. n., Tchelepi, H. A.
  2020; 569: 366–77
- **A two-stage preconditioner for multiphase poromechanics in reservoir simulation** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  White, J. A., Castelletto, N., Klevtsov, S., Bui, Q. M., Osei-Kuffuor, D., Tchelepi, H. A.
  2019; 357
- **Probabilistic Forecast of Single-Phase Flow in Porous Media With Uncertain Properties** *WATER RESOURCES RESEARCH*
  Yang, H., Boso, F., Tchelepi, H. A., Tartakovsky, D. M.
  2019
- **Investigation of Stress Field and Fracture Development During Shale Maturation Using Analog Rock Systems** *TRANSPORT IN POROUS MEDIA*
  Vega, B., Yang, J., Tchelepi, H., Kovscek, A. R.
  2019
- **Reduced variables method for four-phase equilibrium calculations of hydrocarbon-water-CO2 mixtures at a low temperature** *FLUID PHASE EQUILIBRIA*
  Imai, M., Pan, H., Connolly, M., Tchelepi, H., Kurihara, M.
  2019; 497: 151–63
- **Reduced Variables Method for Four-Phase Equilibrium Calculations of Hydrocarbon-H2O-CO2 Mixtures at a Low Temperature** *ECMOR XVI - 16th European Conference on the Mathematics of Oil Recovery*
  Imai, M.
  2018
- **Sequential-implicit Newton method for multiphysics simulation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Wong, Z., Kwok, F., Horne, R. N., Tchelepi, H. A.
  2019; 391: 155–78
- **Three-Phase Equilibrium Computations for Hydrocarbon-Water Mixtures Using a Reduced Variables Method** *INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH*
  Connolly, M., Pan, H., Tchelepi, H.
  2019; 58 (32): 14954–74
- **Nonlinear acceleration of sequential fully implicit (SFI) method for coupled flow and transport in porous media** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Jiang, J., Tchelepi, H. A.
  2019; 352: 246–75
- **Reply to "Comment on 'Multiphase Equilibrium Calculation Framework for Compositional Simulation of CO2 Injection in Low-Temperature Reservoirs'"** *INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH*

Pan, H., Connolly, M., Tchelepi, H.
2019; 58 (28): 12896–97

- **K-Values-Based Upscaling of Compositional Simulation**
  Salehi, A., Voskov, D. V., Tchelepi, H. A.
  SOC PETROLEUM ENG.2019: 579–95
- **Critical time-step for central difference integration schemes in discrete methods: Translational and rotational degrees of freedom, Computer Methods in Applied Mechanics and Engineering** *Computer Methods in Applied Mechanics and Engineering*
  Mimouna, A., et al
  2019
- **Multiscale formulation of pore-scale compressible Darcy-Stokes flow** *Journal of Computational Physics*
  Guo, B., Mehmani, Y., Tchelepi, H.
  2019
- **A general preconditioning framework for coupled multiphysics problems with application to contact- and poro-mechanics** *Journal of Computational Physics*
  Massimiliano, F., et al
  2019; 398 (108887)
- **Multiscale Formulation of Two-Phase Flow at the Pore Scale** *Journal of Computational Physics*
  Mehmani, Y.
  2019
- **Multiscale Formulation of Two-Phase Flow at the Pore Scale** *Journal of Computational Physics*
  Mehmani, Y., Tchelepi, H. A.
  2019
- **Consistent upwinding for sequential fully implicit multiscale compositional simulation** *Consistent upwinding for sequential fully implicit multiscale compositional simulation*
  Moncorge, A.
  2019
- **Multiphase equilibrium calculation framework for compositional simulation of CO2 injection in low temperature reservoirs** *Industrial & Engineering Chemistry Research*
  Pan, H., et al
  2019
- **Dissipation-based continuation method for multiphase flow in heterogeneous porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Jiang, J., Tchelepi, H. A.
  2018; 375: 307–36
- **A Mass-Conservative Sequential Implicit Multiscale Method for Isothermal Equation-of-State Compositional Problems** *SPE JOURNAL*
  Moyner, O., Tchelepi, H. A.
  2018; 23 (6): 2376–93
- **Image-based micro-continuum model for gas flow in organic-rich shale rock** *ADVANCES IN WATER RESOURCES*
  Guo, B., Ma, L., Tchelepi, H. A.
  2018; 122: 70–84
- **Sequential fully implicit formulation for compositional simulation using natural variables** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Moncorge, A., Tchelepi, H. A., Jenny, R.
  2018; 371: 690–711
- **A conservative and well-balanced surface tension model** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Abu-Al-Saud, M. O., Popinet, S., Tchelepi, H. A.
  2018; 371: 896–913
- **A Flexible Temporal Velocity Model for Fast Contaminant Transport Simulations in Porous Media** *WATER RESOURCES RESEARCH*
  Delgoshaie, A. H., Glynn, P. W., Jenny, P., Tchelepi, H. A.

2018; 54 (10): 8500–8513

- **Pore-scale modelling of multiphase reactive flow: application to mineral dissolution with production of CO2** *JOURNAL OF FLUID MECHANICS*
  Soulaine, C., Roman, S., Kovscek, A., Tchelepi, H. A.
  2018; 855: 616–45

- **Sequential implicit nonlinear solver for geothermal simulation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Wong, Z., Horne, R. N., Tchelepi, H. A.
  2018; 368: 236–53

- **Temporal Markov Processes for Transport in Porous Media: Random Lattice Networks** *WATER RESOURCES RESEARCH*
  Delgoshaie, A. H., Jenny, P., Tchelepi, H. A.
  2018; 54 (5): 3376–91

- **Relative Permeability of Near-Miscible Fluids in Compositional Simulators** *TRANSPORT IN POROUS MEDIA*
  Alzayer, A. N., Voskov, D. V., Tchelepi, H. A.
  2018; 122 (3): 547–73

- **Monotone nonlinear finite-volume method for challenging grids** *COMPUTATIONAL GEOSCIENCES*
  Schneider, M., Flemisch, B., Helmig, R., Terekhov, K., Tchelepi, H.
  2018; 22 (2): 565–86

- **Implicit Hybrid Upwinding for two-phase flow in heterogeneous porous media with buoyancy and capillarity** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Hamon, F. P., Mallison, B. T., Tchelepi, H. A.
  2018; 331: 701–27

- **An efficient distribution method for nonlinear two-phase flow in highly heterogeneous multidimensional stochastic porous media** *COMPUTATIONAL GEOSCIENCES*
  Ibrahima, F., Tchelepi, H. A., Meyer, D. W.
  2018; 22 (1): 389–412

- **Unified Thermo-Compositional-Mechanical Framework for Reservoir Simulation** *Computational Geosciences*
  Garipov, T., Tomin, P., Rin, R., Voskov, D., Tchelepi, H.
  2018

- **Multiscale two-stage solver for Biot's poroelasticity equations in subsurface media** *Computational Geosciences*
  Castelletto, N., et al
  2018: 1-18

- **Analysis of travel time distributions for uncertainty propagation in channelized porous systems** *Transport in Porous Media*
  Fuks, O., Ibrahima, F., Tomin, P., Tchelepi, H. A.
  2018: 23

- **Investigation of Stress Field and Fracture Development During Shale Maturation Using Analog Rock Systems** *SPE Annual Technical Conference and Exhibition*
  Vega, B., Yang, J., Tchelepi, H., Kovscek, A. R.
  SPE.2018

- **Effects of Image Resolution on Sandstone Porosity and Permeability as Obtained from X-Ray Microscopy** *Transport in Porous Media*
  Guan, K. M., et al
  2018

- **Micro-continuum Framework for Pore-Scale Multiphase Fluid Transport in Shale Formations** *Transport in Porous Media*
  Soulaine, C., et al
  2018: 1-28

- **Multiscale Computation of Pore-Scale Fluid Dynamics: Single-Phase Flow** *Journal of Computational Physics*
  Mehmani, Y., Tchelepi, H. A.
  2018

- **Measurements and simulation of liquid films during drainage displacements and snap-off in constricted capillary tubes** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*
  Roman, S., Abu-Al-Saud, M. O., Tokunaga, T., Wan, J., Kovscek, A. R., Tchelepi, H. A.
  2017; 507: 279–89
- **Fully implicit mixed-hybrid finite-element discretization for general purpose subsurface reservoir simulation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Abushaikha, A. S., Voskov, D. V., Tchelepi, H. A.
  2017; 346: 514–38
- **Nested sparse grid collocation method with delay and transformation for subsurface flow and transport problems** *ADVANCES IN WATER RESOURCES*
  Liao, Q., Zhang, D., Tchelepi, H.
  2017; 104: 158–73
- **Modified sequential fully implicit scheme for compositional flow simulation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Moncorge, A., Tchelepi, H. A., Jenny, P.
  2017; 337: 98-115
- **Multiscale level-set method for accurate modeling of immiscible two-phase flow with deposited thin films on solid surfaces** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Abu-Al-Saud, M. O., Riaz, A., Tchelepi, H. A.
  2017; 333: 297-320
- **Multiscale finite-element method for linear elastic geomechanics** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Castelletto, N., Hajibeygi, H., Tchelepi, H. A.
  2017; 331: 337-356
- **A two-stage adaptive stochastic collocation method on nested sparse grids for multiphase flow in randomly heterogeneous porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Liao, Q., Zhang, D., Tchelepi, H.
  2017; 330: 828-845
- **Cell-centered nonlinear finite-volume methods for the heterogeneous anisotropic diffusion problem** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Terekhov, K. M., Mallison, B. T., Tchelepi, H. A.
  2017; 330: 245-267
- **Comparison of EoS-Based and K-Values-Based Methods for Three-Phase Thermal Simulation** *TRANSPORT IN POROUS MEDIA*
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2017; 116 (2): 663-686
- **Mineral dissolution and wormholing from a pore-scale perspective** *Journal of Fluid Mechanics*
  Soulaine, C., Roman, S., Kovscek, A., Tchelepi, H.
  2017; 827: 457-483
- **Minimum requirements for predictive pore-network modeling of solute transport in micromodels** *Advances in Water Resources*
  Mehmani, Y., Tchelepi, H.
  2017; 108
- **Pore-Scale Simulation of Interphase Multicomponent Mass Transfer for Subsurface Flow** *TRANSPORT IN POROUS MEDIA*
  Graveleau, M., Soulaine, C., Tchelepi, H. A.
  2017; 120 (2): 287–308
- **Multiscale Characterization of Spatial Heterogeneity of Petroleum Source Rocks via Near-Infrared Spectroscopy** *Fuel*
  Mehmani, Y.
  2017; 208: 337-352
- **Multipoint Distribution of Saturation for Stochastic Nonlinear Two-Phase Transport** *SIAM-ASA JOURNAL ON UNCERTAINTY QUANTIFICATION*
  Ibrahima, F., Tchelepi, H. A.
  2017; 5 (1): 353–77
- **Multiscale finite volume method for discrete fracture modeling on unstructured grids (MS-DFM)** *Journal of Computational Physics*

Bosma, S., Hajibeygi, H., Tene, M., Tchelepi, H. A.
2017; 351: 145-164

- **Parallel Multiscale Linear Solver for Highly Detailed Reservoir Models** *SPE JOURNAL*
  Manea, A. M., SEWALL, J., Tchelepi, H. A.
  2016; 21 (6): 2062-2078
- **From optics to upscaled thermal conductivity: Green River oil shale** *FUEL*
  Mehmani, Y., Burnham, A. K., Tchelepi, H. A.
  2016; 183: 489-500
- **Implicit Hybrid Upwind scheme for coupled multiphase flow and transport with buoyancy** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Hamon, F. P., Mallison, B. T., Tchelepi, H. A.
  2016; 311: 599-624
- **Ordering-based nonlinear solver for fully-implicit simulation of three-phase flow** *COMPUTATIONAL GEOSCIENCES*
  Hamon, F. P., Tchelepi, H. A.
  2016; 20 (5): 909-927
- **Stochastic Galerkin framework with locally reduced bases for nonlinear two-phase transport in heterogeneous formations** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Pettersson, P., Tchelepi, H. A.
  2016; 310: 367-387
- **Particle velocimetry analysis of immiscible two-phase flow in micromodels** *ADVANCES IN WATER RESOURCES*
  Roman, S., Soulaine, C., Abu AlSaud, M., Kovscek, A., Tchelepi, H.
  2016; 95: 199-211
- **Quantification of kerogen content in organic-rich shales from optical photographs** *FUEL*
  Mehmani, Y., Burnham, A. K., Vanden Berg, M. D., Gelin, F., Tchelepi, H.
  2016; 177: 63-75
- **Micro-continuum Approach for Pore-Scale Simulation of Subsurface Processes** *TRANSPORT IN POROUS MEDIA*
  Soulaine, C., Tchelepi, H. A.
  2016; 113 (3): 431-456
- **Phase-state identification bypass method for three-phase thermal compositional simulation** *COMPUTATIONAL GEOSCIENCES*
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2016; 20 (3): 461-474
- **Monotone multiscale finite volume method** *COMPUTATIONAL GEOSCIENCES*
  Wang, Y., Hajibeygi, H., Tchelepi, H. A.
  2016; 20 (3): 509-524
- **Ordering-based nonlinear solver for fully-implicit simulation of three-phase flow** *COMPUTATIONAL GEOSCIENCES*
  Hamon, F. P., Tchelepi, H. A.
  2016; 20 (3): 475-493
- **Block-partitioned solvers for coupled poromechanics: A unified framework** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  White, J. A., Castelletto, N., Tchelepi, H. A.
  2016; 303: 55-74
- **The Impact of Sub-Resolution Porosity of X-ray Microtomography Images on the Permeability** *TRANSPORT IN POROUS MEDIA*
  Soulaine, C., Gjetvaj, F., Garing, C., Roman, S., Russian, A., Gouze, P., Tchelepi, H. A.
  2016; 113 (1): 227-243
- **Discrete fracture model for coupled flow and geomechanics** *COMPUTATIONAL GEOSCIENCES*
  Garipov, T. T., Karimi-Fard, M., Tchelepi, H. A.
  2016; 20 (1): 149-160

- **ANALYSIS OF HYBRID UPWINDING FOR FULLY-IMPLICIT SIMULATION OF THREE-PHASE FLOW WITH GRAVITY** *SIAM JOURNAL ON NUMERICAL ANALYSIS*
  Hamon, F. P., Tchelepi, H. A.
  2016; 54 (3): 1682-1712
- **Non-local formulation for multiscale flow in porous media** *JOURNAL OF HYDROLOGY*
  Delgoshaie, A. H., Meyer, D. W., Jenny, P., Tchelepi, H. A.
  2015; 531: 649-654
- **Accuracy and convergence properties of the fixed-stress iterative solution of two-way coupled poromechanics** *INTERNATIONAL JOURNAL FOR NUMERICAL AND ANALYTICAL METHODS IN GEOMECHANICS*
  Castelletto, N., White, J. A., Tchelepi, H. A.
  2015; 39 (14): 1593-1618
- **Nonlinear analysis of multiphase transport in porous media in the presence of viscous, buoyancy, and capillary forces** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Li, B., Tchelepi, H. A.
  2015; 297: 104-131
- **Interactions between gravity currents and convective dissolution** *ADVANCES IN WATER RESOURCES*
  Elenius, M. T., Voskov, D. V., Tchelepi, H. A.
  2015; 83: 77-88
- **Distribution Functions of Saturation for Stochastic Nonlinear Two-Phase Flow** *TRANSPORT IN POROUS MEDIA*
  Ibrahima, F., Meyer, D. W., Tchelepi, H. A.
  2015; 109 (1): 81-107
- **Hybrid upwind discretization of nonlinear two-phase flow with gravity** *ADVANCES IN WATER RESOURCES*
  Lee, S. H., Efendiev, Y., Tchelepi, H. A.
  2015; 82: 27-38
- **Onset of natural convection in layered aquifers** *JOURNAL OF FLUID MECHANICS*
  Daniel, D., Riaz, A., Tchelepi, H. A.
  2015; 767: 763-781
- **Scale analysis of miscible density-driven convection in porous media** *JOURNAL OF FLUID MECHANICS*
  Jenny, P., Lee, J. S., Meyer, D. W., Tchelepi, H. A.
  2014; 749: 519-541
- **Algebraic multiscale solver for flow in heterogeneous porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Wang, Y., Hajibeygi, H., Tchelepi, H. A.
  2014; 259: 284-303
- **Compositional Multiscale Finite-Volume Formulation** *SPE Journal*
  Hajibeygi, H., Tchelepi, H. A.
  2014; 19 (2): 316-326
- **Unconditionally Convergent Nonlinear Solver for Multiphase Flow in Porous Media under Viscous Force, Buoyancy, and Capillarity**
  Li, B., Tchelepi, H. A., Bruckman, V. J., Hangx, S., Ask, M.
  ELSEVIER SCIENCE BV.2014: 404–11
- **A Negative-Flash Tie-Simplex Approach for Multiphase Reservoir Simulation** *SPE JOURNAL*
  Iranshahr, A., Voskov, D. V., Tchelepi, H. A.
  2013; 18 (6): 1140-1149
- **Influence of capillary-pressure models on CO2 solubility trapping** *ADVANCES IN WATER RESOURCES*
  Li, B., Tchelepi, H. A., Benson, S. M.
  2013; 62: 488-498
- **Rigorous Coupling of Geomechanics and Multiphase Flow with Strong Capillarity** *SPE JOURNAL*

Kim, J., Tchelepi, H. A., Juanes, R.
2013; 18 (6): 1123-1139

- **Tie-Line-Based K-Value Method for Compositional Simulation** *SPE JOURNAL*
  Rannou, G., Voskov, D., Tchelepi, H.
  2013; 18 (6): 1112-1122
- **Trust-region based solver for nonlinear transport in heterogeneous porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Wang, X., Tchelepi, H. A.
  2013; 253: 114-137
- **Thermal adaptive implicit method: Time step selection** *JOURNAL OF PETROLEUM SCIENCE AND ENGINEERING*
  Maes, J., Moncorge, A., Tchelepi, H.
  2013; 106: 34-45
- **Tie-Simplex Based Compositional Space Parameterization: Continuity and Generalization to Multiphase Systems** *AICHE JOURNAL*
  Iranshahr, A., Voskov, D. V., Tchelepi, H. A.
  2013; 59 (5): 1684-1701
- **A fast simulation method for uncertainty quantification of subsurface flow and transport** *WATER RESOURCES RESEARCH*
  Meyer, D. W., Tchelepi, H. A., Jenny, P.
  2013; 49 (5): 2359-2379
- **A scalable multistage linear solver for reservoir models with multisegment wells** *COMPUTATIONAL GEOSCIENCES*
  Zhou, Y., Jiang, Y., Tchelepi, H. A.
  2013; 17 (2): 197-216
- **Nonlinear Formulation Based on an Equation-of-State Free Method for Compositional Flow Simulation** *SPE JOURNAL*
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2013; 18 (2): 264-273
- **Trust-Region Based Solver for Nonlinear Transport in Heterogeneous Porous Media** *Journal of Computational Physics*
  Wang, X., Tchelepi, H. A.
  2013; 253 (null): 114-137
- **The Influence of Capillary Entry-Pressure Representation on CO2 Solubility Trapping** *International Conference on Greenhouse Gas Technologies (GHGT)*
  Li, B., Tchelepi, H. A., Benson, S. M.
  ELSEVIER SCIENCE BV.2013: 3808–3815
- **Efficient Markov Chain Monte Carlo Sampling Using Polynomial Chaos Expansion** *SPE Reservoir Simulation Symposium*
  Bazargan, H., Christie, M. A., Tchelepi, H. A.
  2013
- **Efficient Coupling for Nonlinear Multiphase Flow With Strong Gravity** *SPE Reservoir Simulation Symposium*
  Shahvali, M., Tchelepi, H. A.
  2013
- **Influence of Capillary-Pressure Models on CO2 Solubility Trapping** *Advances in Water Resources*
  Li, B., Tchelepi, H. A., Benson, S. M.
  2013; 62: 488-499
- **Compositional Multiscale Finite-Volume Formulation** *SPE Reservoir Simulation Symposium*
  Hajibeygi, H., Tchelepi, H. A.
  2013
- **Trust-Region-Based Nonlinear Solver for Multiphase Flow and Trans-port in Heterogeneous Porous Media** *SPE Reservoir Simulation Symposium*
  Wang, X., Tchelepi, H. A.
  2013
- **Chemical Reaction Modeling in a Compositional Reservoir Simulation Framework** *SPE Reservoir Simulation Symposium*
  Farshidi, S. F., Fan, Y., Durlofsky, L. J., Tchelepi, H. A.

2013

- **Formulation and Solution of Compositional Displacements in Tie-Simplex Space** *SPE Reservoir Simulation Symposium*
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2013
- **Multi-GPU Parallelization of Nested Factorization for Solving Large Linear Systems** *SPE Reservoir Simulation Symposium*
  Zhou, Y., Tchelepi, H. A.
  2013
- **A fully-coupled flow-reactive-transport formulation based on element conservation, with application to CO2 storage simulations** *ADVANCES IN WATER RESOURCES*
  Fan, Y., Durlofsky, L. J., Tchelepi, H. A.
  2012; 42: 47-61
- **Two-Stage Algebraic Multiscale Linear Solver for Highly Heterogeneous Reservoir Models** *SPE Reservoir Simulation Symposium on Improved Oil Recovery*
  Zhou, H., Tchelepi, H. A.
  SOC PETROLEUM ENG.2012: 523–39
- **Gibbs energy analysis: Compositional tie-simplex space** *FLUID PHASE EQUILIBRIA*
  Iranshahr, A., Voskov, D. V., Tchelepi, H. A.
  2012; 321: 49-58
- **Dynamic Data Integration and Quantification of Prediction Uncertainty Using Statistical-Moment Equations** *SPE JOURNAL*
  Likanapaisal, P., Li, L., Tchelepi, H. A.
  2012; 17 (1): 98-111
- **Multiscale Finite-Volume Formulation for the Saturation Equations** *SPE JOURNAL*
  Zhou, H., Lee, S. H., Tchelepi, H. A.
  2012; 17 (1): 198-211
- **Comparison of nonlinear formulations for two-phase multi-component EoS based simulation** *JOURNAL OF PETROLEUM SCIENCE AND ENGINEERING*
  Voskov, D. V., Tchelepi, H. A.
  2012; 82-83: 101-111
- **Multi-Core and GPU Parallelization of a General Purpose Reservoir Simulator** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Zhou, Y., Tchelepi, H. A.
  2012
- **How Fast Is Your Newton-Like Nonlinear Solver?** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Younis, R. M., Tchelepi, H. A.
  2012
- **Coupled Geomechanics and Flow in Fractured Porous Media** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Garipov , T. T., Levonyan, K. A., F, M. K., Tchelepi, H. A.
  2012
- **Compositional Formulation Based on Piece-wise Linear Representation in Tie-simplex Space** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2012
- **Trust-region Based Nonlinear Solver for Counter-current Two-phase Flow in Heterogeneous Porous Media** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Wang, X., Tchelepi, H. A.
  2012
- **Tie-simplex-based Nonlinear Solver for Mass-variables Compositional Formulation** *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII)*
  Voskov, D. V., Tchelepi, H. A.
  2012

- **Lazy K-Way Linear Combination Kernels for Efficient Runtime Sparse Jacobian Matrix Evaluations in C++** *Lecture Notes in Computational Science and Engineering*
  Younis, R. M., Tchelepi, H. A.
  2012: 333–342

- **Algebraic Multiscale Linear Solver for Heterogeneous Elliptic Problems**
  Wang, Y., Hajibeygi, H., Tchelepi, H. A.
  2012

- **A multiscale method for subsurface inverse modeling: Single-phase transient flow** *ADVANCES IN WATER RESOURCES*
  Fu, J., Caers, J., Tchelepi, H. A.
  2011; 34 (8): 967-979

- **Stability, Accuracy, and Efficiency of Sequential Methods for Coupled Flow and Geomechanics** *SPE Reservoir Simulation Symposium*
  Kim, J., Tchelepi, H. A., Juanes, R.
  SOC PETROLEUM ENG.2011: 249–62

- **Stability and convergence of sequential methods for coupled flow and geomechanics: Drained and undrained splits** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Kim, J., Tchelepi, H. A., Juanes, R.
  2011; 200 (23-24): 2094-2116

- **Compositional Nonlinear Solver Based on Trust Regions of the Flux Function Along KeyTie-lines** *2011 Reservoir Simulation Symposium, ,*
  Voskov, D. V., Tchelepi, H. A.
  2011

- **Compositional Flow Simulation Using Reduced-Variables and Stability-Analysis Bypassing** *Reservoir Simulation Symposium*
  Pan, H., Tchelepi, H. A.
  2011

- **Automatic Differentiation Framework for Compositional Simulation on Unstructured Grids with Multi-Point Discretization Schemes** *2011 Reservoir Simulation Symposium Feb. 21-23*
  Zhou, Y., Tchelepi, H. A., Mallison, B. T.
  2011

- **A Negative-Flash Tie-Simplex Approach for Multiphase Reservoir Simulation** *2011 Reservoir Simulation Symposium, , Feb. 21-23.*
  Iranshahr, A., Voskov, D., Tchelepi, H. A.
  2011

- **Stability and convergence of sequential methods for coupled flow and geomechanics: Fixed-stress and fixed-strain splits** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Kim, J., Tchelepi, H. A., Juanes, R.
  2011; 200 (13-16): 1591-1606

- **Generalized negative-flash method for multiphase multicomponent systems** *FLUID PHASE EQUILIBRIA*
  Iranshahr, A., Voskov, D., Tchelepi, H. A.
  2010; 299 (2): 272-284

- **A joint velocity-concentration PDF method for tracer flow in heterogeneous porous media** *WATER RESOURCES RESEARCH*
  Meyer, D. W., Jenny, P., Tchelepi, H. A.
  2010; 46

- **Convective dissolution of carbon dioxide in saline aquifers** *GEOPHYSICAL RESEARCH LETTERS*
  Neufeld, J. A., Hesse, M. A., Riaz, A., Hallworth, M. A., Tchelepi, H. A., Huppert, H. E.
  2010; 37

- **Particle-based transport model with Markovian velocity processes for tracer dispersion in highly heterogeneous porous media** *WATER RESOURCES RESEARCH*
  Meyer, D. W., Tchelepi, H. A.
  2010; 46

- **A multiscale adjoint method to compute sensitivity coefficients for flow in heterogeneous porous media** *ADVANCES IN WATER RESOURCES*
  Fu, J., Tchelepi, H. A., Caers, J.
  2010; 33 (6): 698-709
- **Numerical Simulation of the In-Situ Upgrading of Oil Shale** *SPE JOURNAL*
  Fan, Y., Durlofsky, L. J., Tchelepi, H. A.
  2010; 15 (2): 368-381
- **Tie-Simplex Parameterization for EOS-Based Thermal Compositional Simulation** *SPE JOURNAL*
  Iranshahr, A., Voskov, D. V., Tchelepi, H. A.
  2010; 15 (2): 545-556
- **Adaptively Localized Continuation-Newton Method Nonlinear Solvers That Converge All the Time** *SPE JOURNAL*
  YOUNIS, R. M., Tchelepi, H. A., AZIZ, K.
  2010; 15 (2): 526-544
- **Non-Iterative Phase Behavior Computation for General Compositional Problems**
  Zaydullin, R., Voskov, D. V., Tchelepi, H. A.
  2010: 2010
- **CO2 TRAPPING IN SLOPING AQUIFERS: HIGH RESOLUTION NUMERICAL SIMULATIONS** *18th International Conference on Computational Methods in Water Resources (CMWR)*
  Elenius, M. T., Tchelepi, H. A., Johannsen, K.
  INT CENTER NUMERICAL METHODS ENGINEERING.2010: 279–286
- **Reduced-Variables Method for General-Purpose Compositional Reservoir Simulation** *SPE International Oil and Gas Conference and Exhibition*
  Pan, H., Tchelepi, H. A.
  2010: 2321–36
- **Extended K-value Method for Multi-contact Miscible Displacements** *12th European Conference on the Mathematics of Oil Recovery (ECMOR XII)*
  Rannou, G., Voskov, D. V., Tchelepi, H. A.
  2010
- **Continuation of the Tie-simplex Space for Three-phase Thermal-compositiona Systems** *12th European Conference on the Mathematics of Oil Recovery (ECMOR XII)*
  Iranshahr, A., Voskov, D. V., Tchelepi, H. A.
  2010
- **Adaptive multiscale finite-volume method for nonlinear multiphase transport in heterogeneous formations** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Lee, S. H., Zhou, H., Tchelepi, H. A.
  2009; 228 (24): 9036-9058
- **Experimental Study of CO2 Injection Into Saline Formations** *SPE JOURNAL*
  Cinar, Y., Riaz, A., Tchelepi, H. A.
  2009; 14 (4): 588-594
- **Unconditionally convergent nonlinear solver for hyperbolic conservation laws with S-shaped flux functions** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Jenny, P., Tchelepi, H. A., Lee, S. H.
  2009; 228 (20): 7497-7512
- **Tie-simplex based mathematical framework for thermodynamical equilibrium computation of mixtures with an arbitrary number of phases** *FLUID PHASE EQUILIBRIA*
  Voskov, D. V., Tchelepi, H. A.
  2009; 283 (1-2): 1-11
- **Compositional Space Parameterization: Multicontact Miscible Displacements and Extension to Multiple Phases** *2008 SPE/DOE Symposium on Improved Oil Recovery*
  Voskov, D. V., Tchelepi, H. A.
  SOC PETROLEUM ENG.2009: 441–49

- **Compositional Space Parameterization: Theory and Application for Immiscible Displacements** *2007 SPE Reservoir Simulation Symposium*
  Voskov, D. V., Tchelepi, H. A.
  SOC PETROLEUM ENG.2009: 431–40
- **Stability Criteria for Thermal Adaptive Implicit Compositional Flows** *SPE JOURNAL*
  Moncorge, A., Tchelepi, H. A.
  2009; 14 (2): 311-322
- **A NEW MIXED FINITE ELEMENT AND ITS RELATED FINITE VOLUME DISCRETIZATION ON GENERAL HEXAHEDRAL GRIDS** *ASME International Mechanical Engineering Congress and Exposition*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  AMER SOC MECHANICAL ENGINEERS.2009: 77–87
- **General Nonlinear Solution Strategies for Multi-Phase Multi-component EoS Based Simulation** *SPE Reservoir Simulation Symposium*
  Voskov, D. V., Younis, R. M., Tchelepi, H. A.
  2009
- **A New Method for Thermodynamic Equilibrium Computation of Systems with an Arbitrary Number of Phases** *SPE Reservoir Simulation Symposium*
  Fraces, C., Voskov, D. V., Tchelepi, H. A.
  2009
- **Scalable Multi-stage Linear Solver for Coupled Systems of Multi- segment Wells and Complex Reservoir Models** *SPE Reservoir Simulation Symposium,*
  Jiang, Y., Tchelepi, H. A.
  2009
- **MODELING UNSTABLE FLOW DYNAMICS IN POROUS MEDIA ASSOCIATED WITH CO2 SEQUESTRATION** *ASME International Mechanical Engineering Congress and Exposition*
  Riaz, A., Cinar, Y., Tchelepi, H.
  AMER SOC MECHANICAL ENGINEERS.2009: 41–43
- **Gravity Currents with Residual Trapping** *9th International Conference on Greenhouse Gas Control Technologies*
  Hesse, M. A., Orr, F. M., Tchelepi, H. A.
  ELSEVIER SCIENCE BV.2009: 3275–81
- **ERROR ANALYSIS OF AN ADAPTIVE IMPLICIT SCHEME FOR HYPERBOLIC CONSERVATION LAWS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  De Loubens, R., Riaz, A., Tchelepi, H. A.
  2009; 31 (4): 2890-2914
- **Tie Simplex Based Parametrization for Compositional Reservoir Simulation** *ASME International Mechanical Engineering Congress and Exposition*
  Voskov, D., Tchelepi, H. A.
  AMER SOC MECHANICAL ENGINEERS.2009: 73–76
- **Tracing Streamlines on Unstructured Grids From Finite Volume Discretizations** *2006 SPE Annual Technical Conference and Exhibition*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  SOC PETROLEUM ENG.2008: 423–31
- **Compositional space parametrization for miscible displacement simulation** *TRANSPORT IN POROUS MEDIA*
  Voskov, D., Tchelepi, H. A.
  2008; 75 (1): 111-128
- **Gravity currents with residual trapping** *JOURNAL OF FLUID MECHANICS*
  Hesse, M. A., Orr, F. M., Tchelepi, H. A.
  2008; 611: 35-60
- **Dynamics of vertical displacement in porous media associated with CO2 sequestration** *2006 SPE Annual Technical Conference and Exhibition*
  Riaz, A., Tchelepi, H. A.
  SOC PETROLEUM ENG.2008: 305–13
- **Multiscale finite-volume formulation for multiphase flow in porous media: black oil formulation of compressible, three-phase flow with gravity** *COMPUTATIONAL GEOSCIENCES*

Lee, S. H., Wolfsteiner, C., Tchelepi, H. A.
2008; 12 (3): 351-366

- **Special issue on multiscale methods for flow and transport in heterogeneous porous media** *COMPUTATIONAL GEOSCIENCES*
  Juanes, R., Tchelepi, H. A.
  2008; 12 (3): 255-256
- **A Lagrangian, stochastic modeling framework for multi-phase flow in porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Tyagi, M., Jenny, P., Lunati, I., Tchelepi, H. A.
  2008; 227 (13): 6696-6714
- **Operator-based multiscale method for compressible flow** *2007 SPE Reservoir Simulation Symposium*
  Zhou, H., Tchelepi, H. A.
  SOC PETROLEUM ENG.2008: 267–73
- **Convergence of implicit monotone schemes with applications in multiphase flow in porous media** *SIAM JOURNAL ON NUMERICAL ANALYSIS*
  Kwok, F., Tchelepi, H. A.
  2008; 46 (5): 2662-2687
- **Compositional Parameterization for Multiphase Flow in Porous Media** *SPE/DOE Symposium on Improved Oil Recovery*
  Voskov, D. V., Tchelepi, H. A.
  2008
- **COMPACT MULTISCALE FINITE VOLUME METHOD FOR HETEROGENEOUS ANISOTROPIC ELLIPTIC EQUATIONS** *MULTISCALE MODELING & SIMULATION*
  Hesse, M. A., Mallison, B. T., Tchelepi, H. A.
  2008; 7 (2): 934-962
- **Potential-based reduced Newton algorithm for nonlinear multiphase flow in porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Kwok, F., Tchelepi, H.
  2007; 227 (1): 706-727
- **Stability of two-phase vertical flow in homogeneous porous media** *PHYSICS OF FLUIDS*
  Riaz, A., Tchelepi, H.
  2007; 19 (7)
- **Adaptive multiscale finite-volume framework for reservoir simulation** *2005 SPE Reservoir Simulation Symposium*
  Tchelepi, H. A., Jenny, P., Lee, S. H., Wolfsteiner, C.
  SOC PETROLEUM ENG.2007: 188–95
- **Streamline tracing on general triangular or quadrilateral grids** *2005 SPE Annual Technical Conference and Exhibition*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  SOC PETROLEUM ENG.2007: 217–23
- **Gravity currents in horizontal porous layers: transition from early to late self-similarity** *JOURNAL OF FLUID MECHANICS*
  Hesse, M. A., Tchelepi, H. A., Cantwell, B. J., Orr, F. M.
  2007; 577: 363-383
- **Forced imbibition in natural porous media: Comparison between experiments and continuum models** *PHYSICAL REVIEW E*
  Riaz, A., Tang, G., Tchelepi, H. A., Kovscek, A. R.
  2007; 75 (3)
- **Compositional Space Parameterization for Flow Simulation** *SPE Reservoir Simulation Symposium*
  Voskov, D., Tchelepi, H. A.
  2007
- **Robust Discretization for Reservoir Simulation on Three Dimensional Unstructured Grids** *SPE Reservoir Simulation Symposium*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  2007

- **Experimental Study of CO2 Injection into Saline Formations** *SPE Annual Technical Conference and Exhibition*
  Cinar, Y., Riaz, A., Tchelepi, H. A.
  2007
- **Robust streamline tracing for the simulation of porous media flow on general triangular and quadrilateral grids** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  2006; 219 (2): 992-1012
- **Adaptive fully implicit multi-scale finite-volume method for multi-phase flow and transport in heterogeneous porous media** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Jenny, P., Lee, S. H., Tchelepi, H. A.
  2006; 217 (2): 627-641
- **Influence of relative permeability on the stability characteristics of immiscible flow in porous media** *TRANSPORT IN POROUS MEDIA*
  Riaz, A., Tchelepi, H. A.
  2006; 64 (3): 315-338
- **Conditional statistical moment equations for dynamic data integration in heterogeneous reservoirs** *2005 SPE Reservoir Simulation Symposium*
  Li, L., Tchelepi, H. A.
  SOC PETROLEUM ENG.2006: 280–88
- **Onset of convection in a gravitationally unstable diffusive boundary layer in porous media** *JOURNAL OF FLUID MECHANICS*
  Riaz, A., Hesse, M., Tchelepi, H. A., Orr, F. M.
  2006; 548: 87-111
- **Numerical simulation of immiscible two-phase flow in porous media** *PHYSICS OF FLUIDS*
  Riaz, A., Tchelepi, H. A.
  2006; 18 (1)
- **Robust Discretization Method for Tensor Permeabilities and Unstructured Grids** *Tenth European Conference on the Mathematics of Oil Recovery*
  Matringe, S. F., Juanes, R., Tchelepi, H. A.
  2006
- **Resolving Density Fingering During CO2 Sequestration: A Challenge for Reservoir Simulation** *CO2SC Symposium*
  Hesse, M. A., Riaz, A., Tchelepi, H. A.
  2006
- **Scaling Analysis of the Migration of CO2 in Saline Aquifers** *SPE Annual Technical Conference and Exhibition*
  Hesse, M., Tchelepi, H. A., Orr, Jr., F. M.
  2006
- **Black Oil Formulation for the Multiscale Finite Volume Mthod** *Computational Methods in Water Resources (CMWR - XVI)*
  Lee, S. H., Wolfsteiner, C., Tchelepi, H. A.
  2006
- **Multi-Scale Approach for Multi-Phase Flow in Porous Media Using Stochastic Particles** *Computational Methods in Water Resources (CMWR - XVI)*
  Jenny, P., Tyagi, M., Tchelepi, H. A., Lunati, E.
  2006
- **Uncertainty Assessment of Transport in Porous Media Based on a Probability Density Function Method** *Tenth European Conference on the Mathematics of Oil Recovery*
  Jenny, P., Tchelepi, H. A., Meyer, D. W.
  2006
- **Stability Criteria for the Thermal Adaptive Implicit Method** *SPE Annual Technical Conference and Exhibition*
  Agarwal, A., Moncorge, A., Tchelepi, H. A.
  2006
- **Tracing Streamlines on Unstructured Grids From Finite Volume Discretizations** *SPE Annual Technical Conference and Exhibition*

Matringe, S. F., Juanes, R., Tchelepi, H. A.
2006

- **Well modeling in the multiscale finite volume method for subsurface flow simulation** *MULTISCALE MODELING & SIMULATION*
Wolfsteiner, C., Lee, S. H., Tchelepi, H. A.
2006; 5 (3): 900-917

- **Adaptive multiscale finite-volume method for multiphase flow and transport in porous media** *MULTISCALE MODELING & SIMULATION*
Jenny, P., Lee, S. H., Tchelepi, H. A.
2005; 3 (1): 50-64

- **An Adaptive Multiphase Multiscale Finite Volume Simulator for Heterogeneous Reservoirs** *19th SPE Reservoir Simulation Symposium The Woodlands, Texas*
Tchelepi, H. A., Jenny, P., Lee, S. H., Wolfsteiner, C.
2005

- **Application of an Efficient Multiscale Finite Volume Simulator to Practical Reservoir Models** *SPE International Petroleum Technology Conference (IPTC)*
Wolfsteiner, C., Gadelle, F., Lee, S. H., Tchelepi, H. A.
2005

- **Advances in Reservoir Simulation** *Proceedings of the 8th International Forum on Reservoir Simulation*
Tchelepi, H. A., Aziz, K.
2005

- **Streamline Tracing on General Triangular or Quadrilateral Grids** *SPE Annual Technical Conference and Exhibition*
Matringe, S. F., Juanes, R., Tchelepi, H. A.
2005

- **An Extensible Architecture for Next Generation Scalable Parallel Reservoir Simulation** *19th SPE Reservoir Simulation Symposium*
Debaun, et al., D.
2005

- **Parallel Scalable Unstructured CPR-Type Linear Solver for Reservoir Simulation** *SPE Annual Technical Conference and Exhibition October 9 - 12*
Cao, H., Tchelepi, H. A., Wallis, J. R., Yardumian, H.
2005

- **Reservoir Studies: Dynamic Study** *Encyclopedia of Hydrocarbons - 50th Anniversary of ENI-Agip Oil Company*
Tchelepi, H. A.
ENI-Agip Oil Company, Italy.2005

- **Linear stability analysis of immiscible two-phase flow in porous media with capillary dispersion and density variation** *PHYSICS OF FLUIDS*
Riaz, A., Tchelepi, H. A.
2004; 16 (12): 4727-4737

- **Implicit-Explicit (IE) Preconditioning for Adaptive Implicit Systems** *ChevronTexaco/Schlumberger Technical Alliance*
Wallis, J. R., Cao, H., Tchelepi, H. A.
2004

- **Statistical Moment Equations for Flow in Composite Heterogeneous Porous Media** *Ninth European Conference on the Mathematics of Oil Recovery*
Li, L., Tchelepi, H. A.
2004

- **Unmatached Multiblock Grids for Simulation of Geometrically Complex Reservoirs** *Ninth European Conference on the Mathematics of Oil Recovery*
Wolfsteiner, C., Lee, S. H., Tchelepi, H. A., Jenny, P., Chen, W. H.
2004

- **Conditional stochastic moment equations for uncertainty analysis of flow in heterogeneous reservoirs** *2003 SPE Reservoir Simulation Symposium*
Li, L., Tchelepi, H. A.
SOC PETROLEUM ENG.2003: 392–400

- **Perturbation-based moment equation approach for flow in heterogeneous porous media: applicability range and analysis of high-order terms** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Li, L. Y., Tchelepi, H. A., Zhang, D. X.
  2003; 188 (1): 296-317
- **Multi-scale finite-volume method for elliptic problems in subsurface flow simulation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Jenny, P., Lee, S. H., Tchelepi, H. A.
  2003; 187 (1): 47-67
- **Block Smoothed Aggregation Algebraic Multigrid for Reservoir Simulation Systems** *Copper Mountain Conference on Multigrid Methods*
  Papadopoulos, A., Tchelepi, H. A.
  2003
- **New Developments in Multiblock Reservoir Simulation: Black Oil Modeling, Nonmatching Subdomains and Near-Well Upscaling** *SPE Reservoir Simulation Symposium*
  Lee, S. H., Wolfsteiner, C., Durlofsky, L. J., Jenny, P., Tchelepi, H. A.
  2003
- **Implementation of a flux-continuous finite-difference method for stratigraphic, hexahedron grids** *1999 SPE Reservoir Simulation Symposium*
  Lee, S. H., Tchelepi, H. A., Jenny, P., DeChant, L. J.
  SOC PETROLEUM ENG.2002: 267–77
- **A finite-volume method with hexahedral multiblock grids for modeling flow in porous media** *COMPUTATIONAL GEOSCIENCES*
  Lee, S. H., Jenny, P., Tchelepi, H. A.
  2002; 6 (3-4): 353-379
- **Stochastic formulation for uncertainty analysis of two-phase flow in heterogeneous reservoirs** *1999 SPE Reservoir Simulation Symposium*
  Zhang, D. X., Li, L. Y., Tchelepi, H. A.
  SOC PETROLEUM ENG.2000: 60–70
- **Stochastic Formulation for Uncertainty Assessment of Two-Phase Flow in Heterogeneous Reservoirs** *SPE Journal*
  Zhang, D., Li, L., Tchelepi, H. A.
  2000; 5 (1): 60-70
- **Stochastic Analysis of Immiscible Two-Phase Flow in Heterogeneous Media** *SPE JOURNAL*
  Zhang, D., Tchelepi, H.
  1999; 4 (4): 380-388
- **Practical use of scale up and parallel reservoir simulation technologies in field studies** *1997 SPE Annual Technical Conference and Exhibition*
  Tchelepi, H. A., Durlofsky, L. J., Chen, W. H., Bernath, A., Chien, M. C.
  SOC PETROLEUM ENG.1999: 368–76
- **Stochastic Analysis of Immiscible Two-Phase Flow in Heterogeneous Media** *SPE Journal*
  Zhang, D., Tchelepi, H. A.
  1999; 4 (4): 380-388
- **A Scalable Parallel Multi-Purpose Reservoir Simulator** *SPE Reservoir Simulation Sypmposium*
  Chien, M. H., Tchelepi, H. A., Yardumian, H. E., Chen, W. H.
  1997
- **Multigrid Applied to Implicit Well Problems** *Fifth European Multigrid Confernece*
  Dendy, Jr., J. E., Tchelepi, H. A.
  1996
- **INTERACTION OF VISCOUS FINGERING, PERMEABILITY HETEROGENEITY, AND GRAVITY SEGREGATION IN 3 DIMENSIONS** *SPE RESERVOIR ENGINEERING*
  Tchelepi, H. A., Orr, F. M.
  1994; 9 (4): 266-271
- **AN IMPROVED MACROSCOPIC MODEL FOR VISCOUS FINGERING AND ITS VALIDATION FOR 2D AND 3D FLOWS .1. NON-GRAVITY FLOWS** *IN SITU*

FAYERS, F. J., JOUAUX, F., Tchelepi, H. A.
1994; 18 (1): 43-78

- **Unstable Flow in 2D and 3D Heterogeneous Porous Media** *International Energy Agency Workshop on Enhanced Oil Recovery*
  Tchelepi, H. A., Orr, Jr., F. M.
  1994

- **Effect of Electroosmosis on Relative Permeabilities of Sandstones** *J.Pet. Sci. Eng.*
  Aggour, M. A., Tchelepi, H. A., Al-Yousef, H. Y.
  1994; 11 (2): 91-102

- **On the validity of macroscopic viscous fingering models for 2D and 3D-flows** *4th European Conference on the Mathematics of Oil Recovery (ECMOR IV)*
  FAYERS, F. J., JOUAUX, F., Tchelepi, H.
  ICMOR IV.1994: 1–21

- **AN IMPROVED MACROSCOPIC MODEL FOR VISCOUS FINGERING AND ITS VALIDATION FOR 2D AND 3D FLOWS .2. FLOWS INFLUENCED BY GRAVITY** *IN SITU*
  FAYERS, F. J., JOUAUX, F., Tchelepi, H. A.
  1994; 18 (1): 79-105

- **DISPERSION, PERMEABILITY HETEROGENEITY, AND VISCOUS FINGERING - ACOUSTIC EXPERIMENTAL-OBSERVATIONS AND PARTICLE-TRACKING SIMULATIONS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
  Tchelepi, H. A., Orr, F. M., Rakotomalala, N., Salin, D., WOUMENI, R.
  1993; 5 (7): 1558-1574

- **Interactions of Viscous Fingering, Permeability Heterogeneity and Gravity Segregation in 2D and 3D Flows in Porous Media** *International Engery Agency Workshop on Enhanced Oil Recovery*
  Tchelepi, H. A., Orr, Jr., F. M.
  1993