

Curriculum Vitae

PERSONAL DATA

Name: Shuyu Sun
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<http://ctpl.kaust.edu.sa> (Shuyu Sun's Research Lab: CTPL)
ORCID: <http://orcid.org/0000-0002-3078-864X>
ResearcherID: <http://www.researcherid.com/rid/G-9910-2013>
Google scholar: <https://scholar.google.com/citations?user=qn4i9rUAAAAJ>

RESEARCH INTERESTS

- 1) Finite element methods (in particular, adaptive discontinuous Galerkin methods and mixed finite element methods for flow and reactive transport problems in porous media) and numerical analysis (*a priori* and *a posteriori* error estimation)
- 2) Numerical oil reservoir simulations and computational transport phenomena
- 3) Computational thermodynamics of reservoir fluids including Monte Carlo molecular simulation and molecular dynamics simulation

EDUCATION

- ◆ **Doctor of Philosophy (Ph.D.), Computational and Applied Mathematics** (August 2003)
GPA: 4.0/4.0
Institute for Computational Engineering and Sciences, The University of Texas at Austin
Specialization: Finite Element Methods for Flow and Transport
Thesis advisor: Prof. Dr. Mary F. Wheeler, *member of U.S. National Academy of Engineering*
- ◆ **Master of Science, Computational and Applied Mathematics** (December 2002)
GPA: 4.0/4.0
Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin
Specialization: Finite Element Methods for Flow and Transport
- ◆ **Doctor of Engineering (D.Eng.), Chemical Engineering** (October 1997)
Chemical Engineering Research Center, Tianjin University, China
Specialization: Mass Transfer and Separation Engineering
Thesis advisor: Prof. Dr. Guochong (K. T.) Yu, *member (academician) of Chinese Academy of Sciences*
- ◆ **Master of Engineering, Chemical Engineering** (May 1994)
Department of Chemical Engineering, Tianjin University, China
Specialization: Mass Transfer and Separation Engineering
- ◆ **Bachelor of Engineering, Industrial Chemistry** (July 1991)
Department of Chemical Engineering, Tianjin University, China

PROFESSIONAL/BOARD CERTIFICATION

- ◆ **Licensed Professional Engineer (P.E.)** (Texas License No. 94569, December 15, 2004 – Present)

Passed the FE and PE (chemical engineering) exams in 2004.

◆ **SPEC, i.e. SPE Certification**

Achieved the certification under the SPE Petroleum Engineering Certification Program in November 2010. (SPE is the Society of Petroleum Engineers)

◆ **Sun Certified Programmer for the Java 2 Platform** (January 25, 2003 – January 25, 2005)

PROFESSIONAL EXPERIENCE

Primary Positions

◆ **Principal Investigator of CTPL** (August 2009 – Present)

Computational Transport Phenomena Laboratory (CTPL), King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia

◆ **Co-Director of CSIM** (October 2009 – Present)

Center for Subsurface Imaging and Fluid Modeling consortium (CSIM), King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia

◆ **Associate Professor of Applied Math & Computational Science (AMCS)** (Oct 1, 2012 – Present)

Division of Computer, Electrical & Mathematical Sciences & Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia

◆ **Associate Professor of Earth Science and Engineering (ErSE)** (Oct 1, 2012 – Present)

Division of Physical Sciences and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia

◆ **Assistant Professor of AMCS and ErSE** (August 2009 – September 2011)

King Abdullah University of Science and Technology (KAUST), Thuwal, Kingdom of Saudi Arabia

◆ **Assistant Professor of Mathematical Sciences** (August 2006 – August 2010)

Department of Mathematical Sciences, Clemson University, Clemson, South Carolina
(On leave of absence during August 2009 – August 2010)

◆ **Research Associate** (February 2005 – August 2006)

Center for Subsurface Modeling, Institute for Computational Engineering and Sciences, The University of Texas at Austin

◆ **Postdoctoral Fellow** (September 2003 – January 2005)

Institute for Computational Engineering and Sciences, The University of Texas at Austin

◆ **Research Assistant** (September 1999 – August 2003)

Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin

Guest or Adjunct Positions

◆ **Adjunct Professor (兼职教授 博士生导师)** (March 2010 – March 2016)

College of Science, Xi'an Jiao Tong University, Xi'an, China

◆ **Adjunct Professor (兼职研究生导师)** (June 2012 – Present)

China University of Petroleum-Beijing, Changping District, Beijing, China

◆ **Adjunct Professor (兼职教授)** (March 2017 – February 2021)

China University of Petroleum (East China), Huangdao District, Qingdao, China

- ◆ **Guest Professor (客座教授)** (March 5, 2018 – March 5, 2020)
China University of Geosciences (Wuhan), Wuhan, China

Short-Term Visiting Positions

- ◆ **Visiting Scholar** (January 18 – 23, 2015)
*Institute of Petroleum Engineering
Heriot-Watt University, Edinburgh, EH14 4AS, United Kingdom*
- ◆ **Visiting Professor** (December 14 – 31, 2014 and May 13 – 31, 2016)
*College of Mechanical and Transportation Engineering
China University of Petroleum at Beijing, China*
- ◆ **Visiting Scholar** (May 25 – June 25, 2014)
*Department of Mechanical Engineering, University of California, Berkeley
Berkeley, California, USA*
- ◆ **Visiting Scholar** (July 3 – July 15, 2013, and June 28 – July 12, 2014)
*Department of Informatics, TUM (Technische Universität München)
Boltzmannstrasse 3, D-85748 Garching, Germany*
- ◆ **Visiting Scholar** (December 5 – December 13, 2012)
*Oxford Centre for Collaborative Applied Mathematics (OCCAM), Mathematical Institute,
Oxford University, United Kingdom*
- ◆ **Visiting Scholar** (June 15 – July 17, 2012 and July 15 – August 15, 2014)
Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong
- ◆ **Visiting Scholar** (June 19 – July 19, 2011)
Department of Mechanical Engineering, Stanford University, Palo Alto, California, USA
- ◆ **Research Scientist** (April 30 – May 31, 2009, and May 31 – June 30, 2010)
Reservoir Engineering Research Institute (RERI), Palo Alto, California, USA
- ◆ **Oden Faculty Research Fellow** (July 15 – August 15, 2008 and July 6 – August 7, 2009)
(Supported by J. T. Oden Faculty Fellowship Research Program)
Institute for Computational Engineering and Sciences, The University of Texas at Austin
- ◆ **Visiting Scholar** (July 23 – August 8, 2007)
School of Mathematical Sciences, Peking University, China
- ◆ **Visiting Scholar** (May 14 – July 14, 2007)
School of Chemical Engineering, Tianjin University, China
- ◆ **Visiting Scholar** (December 20, 2006 – January 8, 2007)
Department of Mathematics, National Taiwan University, Taipei, Taiwan

TEACHING EXPERIENCE

Classes Taught at King Abdullah University of Science and Technology (KAUST)

Summer 2018: ErSE 390X (Multiscale Modeling of Geological Reservoirs)
Spring 2018: ErSE 305 (Multiphase Flows in Porous Media)

Fall 2017:	ErSE 202 (Computational Groundwater Hydrology)
Spring 2017:	ErSE 390F (Pore-Scale Modeling of Subsurface Flow)
Fall 2016:	ErSE 209 (Thermodynamics of Subsurface Reservoirs)
Spring 2016:	ErSE 305 (Multiphase Flows in Porous Media)
Fall 2015:	ErSE 202 (Computational Groundwater Hydrology)
Spring 2015:	ErSE 209/309 (Thermodynamics of Subsurface Reservoirs)
Fall 2014:	ErSE 390 (Pore-Scale Modeling of Subsurface Flow)
Spring 2014:	ErSE 305 (Multiphase Flows in Porous Media)
Fall 2013:	ErSE 202 (Computational Groundwater Hydrology)
Spring 2013:	ErSE 209/309 (Thermodynamics of Subsurface Reservoirs)
Fall 2012:	ErSE 305 (Multiphase Flows in Porous Media)
Spring 2012:	ErSE 202 (Computational Groundwater Hydrology)
Fall 2011:	ErSE 209/309 (Thermodynamics of Subsurface Reservoirs)
Spring 2011:	ErSE 202 (Computational Groundwater Hydrology)
Fall 2010:	ErSE 305 (Multiphase Flows in Porous Media)
Spring 2010:	ErSE 202/EnSE 224 (Computational Groundwater Hydrology)
Fall 2009:	AMCS 201 (Applied Mathematics I) (assisting David Keyes)
	ErSE 216 (Inverse Problems) (jointly taught with Ibrahim Hoteit)

Classes Taught at Clemson University, USA

Spring 2009:	MthSc 866 (Introduction to Finite Element Methods)
	MthSc 499 (Creative Inquiry: MACOBE)
Fall 2008:	MthSc 860 (Introduction to Scientific Computing)
	MthSc 499 (Creative Inquiry: MACOBE)
	MthSc 360 (Intermediate Mathematical Computing)
Spring 2008:	MthSc 360 (Intermediate Mathematical Computing)
Fall 2007:	MthSc 860 (Introduction to Scientific Computing)
	MthSc 360 (Computer Analysis in Engineering)
Spring 2007:	MthSc 460/660 (Introduction to Numerical Analysis)
Fall 2006:	MthSc 208 (Introduction to Ordinary Differential Equations)

Supervision of Postdoctoral Fellows and Research Scientists at KAUST (Current)

Nilesh Choudhary	Postdoctoral Fellow, expected to start on November 2018
Jalim Singh	Postdoctoral Fellow, expected to start on September 2018
Piyang Liu	Postdoctoral Fellow, March 21, 2018 – Present
Jingfa Li	Postdoctoral Fellow, December 24, 2017 – Present
Dong-Joon Youn	Postdoctoral Fellow, February 1, 2017 – Present
Arun Kumar Narayanan Nair	Research Scientist, April 7, 2016 – Present

Supervision of Postdoctoral Fellows and Research Scientists at KAUST (Past)

Huangxin Chen	Postdoctoral Fellow, May 1, 2015 – May 1, 2016
	First position afterward: Associate Professor, School of Mathematical Sciences, Xiamen University, Xiamen, China (zip code: 361005)
Meng-Huo Chen	Postdoctoral Fellow, February 7, 2015 – May 1, 2016
	First position afterward: Research Fellow, School of Computing, Faculty of Engineering, University of Leeds, Leeds, LS2 9JT, UK
Arun Kumar Narayanan Nair	Postdoctoral Fellow, April 6, 2014 – April 6, 2016
	First position afterward: Research Scientist, KAUST
Hua Zhong	Postdoctoral Fellow, October 15, 2013 – December 21, 2015
	First position afterward: Associate Professor, School of Mathematics and Statistics, Guangdong University of Finance and Economics, China
Mohamed F. ElAmin	Research Scientist, October 1, 2013 – September 30, 2015
	First position afterward: Professor, Math Dept, Effat University, Jeddah, Saudi Arabia
Amgad Salama	Postdoctoral Research Fellow, January 15, 2011 – August 1, 2015
	First position afterward: Visiting Research Scientist, RERI, USA
Siarhei Khirevich	Postdoctoral Fellow, April 30, 2014 – May 10, 2015

- First position afterward: Research Scientist, Upstream Petroleum Engineering Research Center, KAUST
- Kai Bao Postdoctoral Fellow (Joint with HKUST), Sept 15, 2010 – Jan 15, 2014
First position afterward: Research Scientist, Dept of Applied Math, SINTEF, Oslo, Norway
- Mohamed F. ElAmin Postdoctoral Research Fellow, October 1, 2009 – September 30, 2013
First position afterward: Research Scientist, KAUST
- Yi Wang Postdoctoral Fellow, September 1, 2012 – August 31, 2013
First position afterward: Assistant Professor, China University of Petroleum at Beijing
Since 2014: Associate Professor, China University of Petroleum at Beijing
- Jie Chen Postdoctoral Fellow (Joint with HKUST), Sept 1, 2010 – Feb 14, 2013
First position afterward: Assistant Professor, Xi'an Jiaotong University, China
- Huancong Huang Postdoctoral Research Fellow, March 31, 2011 – January 5, 2012
First position afterward: Research Scientist, Nanyang Technological University
- Jun Li Postdoc Research Fellow (Joint w Victor Calo), Dec 15, 2010 – Dec 2011
First position afterward: Research Scientist, King Fahd University of Petroleum & Minerals
- Jisheng Kou Postdoctoral Research Fellow, December 1, 2009 – Dec 2011
First position afterward: Professor and Vice Dean,
School of Mathematics and Statistics, Hubei Engineering University
- Chuanxiu Xu Postdoctoral Research Fellow, October 1, 2009 – September 30, 2010
First position afterward: Assistant Professor, Southeast University, China

Supervision of PhD Students at KAUST as Thesis Advisor

- Jiangfeng Cui Earth Science and Engineering, August 2018 – Present
- Jia-Hong Huang Earth Science and Engineering, January 2018 – Present
- Yang Liu Applied Mathematics and Computational Science, August 2017 – Present
- Yafan Yang Earth Science and Engineering, January 2017 – Present
- Tao Zhang Earth Science and Engineering, August 2016 – Present
- Yiteng Li Earth Science and Engineering, January 2016 – Present
- Dias Urozayev Earth Science and Engineering, August 2015 – Present
(Advised jointly by Ibrahim Hoteit and S. Sun)
- Xiaolin Fan Earth Science and Engineering, August 2013 – Present
- Sahar Amir Earth Science and Engineering, August 2013 – Present
- Ahmad Kadoura Earth Science and Engineering, June 2011 – September 2016
Thesis: “Molecular simulation towards efficient and representative subsurface reservoirs modeling”, defended in Building 2 (Sea Side), Level 5, Room 5209, KAUST, 5:00pm - 7:00pm, Tuesday September 27, 2016.
(Thesis committee: S. Sun, Georgiy Stenchikov, Zhiping Lai, and Abbas Firoozabadi)
First position after graduation: Research Engineer, The Dow Chemical Company
- Yuanqing Wu Applied Mathematics and Computational Science, Sept 2010 – Dec 2015
Thesis: “Parallel reservoir simulations with sparse grid techniques and applications to wormhole propagation”, defended in Room 3422, Level 4, Building 1, KAUST, 4:30pm - 7:00pm, Wednesday October 28, 2015.
(Thesis committee: S. Sun, David Keyes, Omar M. Knio, Xiao-Chuan Cai, and Yu-Shu Wu)
First position after graduation: Assistant Professor, Shenzhen University, China
- Ardiansyah Negara Earth Science and Engineering, June 2011 – May 2015
Thesis: “Subsurface flow modeling in single and dual continuum anisotropic porous media using the multipoint flux approximation method”, defended in Blg 1, Level 4, Rm 4214, KAUST, 5:15pm - 7:15pm, Wednesday April 15, 2015.
(Thesis committee: S. Sun, Ibrahim Hoteit, Zhiping Lai, Joachim Moortgat, and Yu-Shu Wu)
First position after graduation: Petroleum Engineer, Dhahran Global Tech Ctr, Baker Hughes.
- Rebecca Allen Earth Science and Engineering, May 2011 – May 2015
Thesis: “Modeling diffusion and buoyancy-driven convection with application to geological CO₂ storage”, defended in Room 4214, Building 1, KAUST, 1:00pm – 3:00pm, Wednesday March 18, 2015.
(Thesis committee: S. Sun, Georgiy Stenchikov, Yalchin Efendiev, and Timothy Reis)
First position after graduation: Postdoc, SINTEF, Oslo, Norway (starting June 1, 2015)

Klemens Katterbauer Earth Science and Engineering, May 2013 – March 2015
 (Advised jointly by Ibrahim Hoteit and S. Sun)
 Thesis: “Multi data reservoir history matching using the ensemble Kalman filter”, defended in Blg 3, Level 5, Rm 5220, KAUST, 10:00am-1:00pm, Sunday March 1, 2015.
 (Thesis committee: I. Hoteit, S. Sun, Gerard Schuster, Sigurjón Jónsson, & Alberto Marsala)
 First position after graduation: Engineer, Resoptima AS, Kirkegata 17, N-0153 Oslo, Norway

Supervision of Master’s Students at KAUST as Thesis Advisor

Mohd Fuad Anwari Che Ruslan Earth Science and Engineering, August 2016 – Present

Arturo Martinez Jimenez Earth Science and Engineering, Sept 2014 – May 2016
 Thesis: “A grand canonical Monte Carlo molecular study of a weak polyampholyte”, defended in Room 3422, Building 1, KAUST, Thuwal, 4:00-5:30pm, Tuesday, May 3, 2016.
 (Thesis committee members: S. Sun, Ibrahim Hoteit, Omar Knio, and Arun Kumar Narayanan Nair)

Ahmed Mohamed Saad Earth Science and Engineering, Sept 2014 – May 2016
 Thesis: “Multi-scale modeling of compressible single-phase flow in porous media using molecular simulation”, defended in Room 3119, Level 3 (sea side), Building 1, KAUST, Thuwal, 1:00-2:30pm, Monday, May 2, 2016.
 (Thesis committee members: S. Sun, Georgiy L. Stenchikov, and Omar Knio)

Pablo De La Garza Martinez Earth Science and Engineering, Sept 2014 – May 2016
 Thesis: “Pore network modeling: alternative methods to account for trapping and spatial correlation”, defended in Room 5209, Level 5 (sea side), Building 3, KAUST, Thuwal, 11:00am-12:30pm, Sunday, May 1, 2016.
 (Thesis committee members: S. Sun, Ibrahim Hoteit, and Zhiping Lai)

Dias Urozayev Earth Science and Engineering, Sept 2013 – Aug 2015
 Thesis: “Numerical simulation of shale gas production with thermodynamic calculations incorporated”, defended in Room 4214, Level 4, Building 1, KAUST, Thuwal, 10:00-11:30am, Wednesday, June 17th, 2015.
 (Thesis committee members: S. Sun, Tadeusz W. Patzek, and Ibrahim Hoteit)
 First position after graduation: PhD student, KAUST

Sahar Amir Computer Science, September 1, 2011 – May 2013 (joint w David Keyes)
 Thesis: “Accelerating Monte Carlo molecular simulations using novel extrapolation schemes combined with fast database generation on massively parallel machines”, defended in Room 4102, Building 1, KAUST, 1:30-3:00pm, May 7, 2013
 (Thesis committee members: S. Sun, David Keyes, and Mikhail Moshkov)
 First position after graduation: PhD student, KAUST

Zhiwei Ma Earth Science and Engineering, Sept 2011 – May 2013
 Thesis: “Phase behaviors of reservoir fluids with capillary effect using particle swarm optimization”, defended in Room 4418, Building 1, KAUST, 3:00-4:30pm, May 6, 2013
 (Thesis committee members: S. Sun, Zhiping Lai, and Ying Wu)
 First position after graduation: PhD student, University of Alberta, Canada

Sebastian Saavedra Earth Science and Engineering, Sept 2010 – August 2012
 Thesis: “A finite difference, IMPEC, equation-of-state efficient algorithm for the compositional flow modeling in the subsurface”, defended in Room 3422, Building 1, KAUST, 4:30-5:30pm, July 4, 2012
 (Thesis committee members: S. Sun, Victor Calo, and Zhiping Lai)
 First position after graduation: Engineer, Saudi Arabian Oil Company

Shouhong Du Applied Mathematics and Computational Science, Sept 2010 – June 2012
 Thesis: “Monte Carlo molecular simulation with isobaric-isothermal and Gibbs-NPT ensembles”, defended in Room 3422, Building 1, KAUST, 11:00am, May 2, 2012
 (Thesis committee members: S. Sun, Zhiping Lai, and Ying Wu)
 First position after graduation: Engineer, Saudi Arabian Oil Company

Hossam O. Osman Earth Science and Engineering, Sept 2010 – May 2012
 Thesis: “A finite difference, multipoint flux numerical approach to flow in porous media”, defended in Room 3422, Building 1, KAUST, 1:00pm, April 16, 2012
 (Thesis committee members: S. Sun, Georgiy Stenchikov, and Ibrahim Hoteit)

- First position after graduation: Engineer, Saudi Arabian Oil Company
 Ardiansyah Negara Earth Science and Engineering, Sept 2009 – June 2011
 Thesis: “Simulation of CO₂ injection in porous media with structural deformation effect”,
 defended in Room 3119, Building 1, KAUST, 10:00-11:00am, June 18, 2011
 (Thesis committee members: S. Sun, Victor Calo, and Zhiping Lai)
 First position after graduation: PhD student, KAUST
- Ahmad Kadoura Chemical and Biological Engineering, Sept 2009 – June 2011
 Thesis: “Study of Monte Carlo simulation method for methane phase diagram prediction
 using two different potential models”, defended in Room 3422, Building 1, KAUST, 8:30-
 9:30am, June 18, 2011
 (Thesis committee members: S. Sun, Klaus-Viktor Peinemann, and Zhiping Lai)
 First position after graduation: PhD student, KAUST
- Rebecca Allen Environmental Science and Engineering, Sept 2009 – May 2011
 Thesis: “CO₂ sequestration in saline aquifers: modeling diffusive and convective transport of
 a CO₂ cap”, defended in Room 4418, Building 1, KAUST, 2:00-3:00pm, May 11, 2011
 (Thesis committee members: S. Sun, Georgiy Stenichikov, and Peng Wang)
 First position after graduation: PhD student, KAUST
- Mohamad Elgharamti Earth Science and Engineering, Sept 2009 – Dec 2010 (w Ibrahim Hoteit)
 Thesis: “Low-rank Kalman filtering in subsurface contaminant transport models”, defended
 in Room 3422, Building 1, KAUST, 4:00pm, December 13, 2010
 (Thesis committee members: S. Sun, Ibrahim Hoteit, and Georgiy Stenichikov)
 First position after graduation: PhD student, KAUST
 Since 2015: Research Scientist, Nansen Environmental & Remote Sensing Centre (Nersec),
 Bergen, Norway.

Supervision of Graduate Students at KAUST as Instructor of Directed Research

Sultan Safin	Spring and summer semesters, 2013
Ibrahim Gawish	Fall semester, 2012
Sultan Safin	Fall semester, 2012
Zhiwei Ma	Spring semester, 2012
Sebastian Saavedra	ErSE 299H, Fall semester, 2011
Waqas Ahmed Khan	ErSE 299H, Spring semester, 2011
Sebastian Saavedra	ErSE 299H, Spring semester, 2011
Keyang Dai	AMCS 299, Fall semester, 2010
Guilherme Blaitterman Ribeiro Jr	ErSE 299, Fall semester, 2010
Wenhui Wang	ErSE 399B, Spring semester, 2010
Guilherme Blaitterman Ribeiro Jr	ErSE 299A, Spring semester, 2010
Mohamad Elgharamti	ErSE 299A, Spring semester, 2010
Ardiansyah Negara	ErSE 299A, Spring semester, 2010

Supervision of Graduate Students at KAUST as Research Project Supervisor

- Monica Corona Trujillo Earth Science and Engineering, Aug 2015 – May 2017
- Ibrahim Gawish Earth Science and Engineering, Sept 2012 – August 2014
 First position after graduation: Engineer, Saudi Arabian Oil Company
- Sultan Safin Earth Science and Engineering, Sept 2012 – Jan 2014
 First position after graduation: Engineer, Saudi Arabian Oil Company
- Zhiling Tang
 Graduate student in Computer Science, KAUST, Sept 1, 2009 – Dec 15, 2011
 Research topic: Parallel computation of fluid property & fluid flow in subsurface reservoirs
 First position after graduation: Engineer, Saudi Arabian Oil Company

Supervision of Research Intern Students at KAUST

- Jihong Shi Visiting intern student
 A Master’s student from China University of Petroleum, Qingdao
 Period: January 1, 2018 to June 15, 2018,
- Yuze Zhang Visiting intern student

	A PhD student from The Hong Kong Polytechnic University, Hong Kong Period: December 16, 2017 to December 30, 2017.
Guangpu Zhu	Visiting intern student
	A Master's student from China University of Petroleum, Qingdao Period: February 25, 2017 to August 25, 2017, and Dec 2017-May 2018.
Gongsheng Li	Visiting intern student
	A 4 th -year undergraduate student from China Univ of Petroleum, Beijing Period: December 10, 2017 to January 20, 2018.
Xiaoyu Feng	Visiting intern student
	A Master's student from China University of Petroleum, Beijing Period: February 1, 2017 to May 15, 2017, and Dec 2017-May 2018.
Jingzhe Li	Visiting intern student
	A PhD student from Beijing Normal University Period: September 2015 to March 2016.
Jingfa Li	Visiting intern student
	A PhD student from China University of Petroleum, Beijing Period: September 20 – November 1, 2015.
Tao Zhang	Visiting intern student with Visiting Student Research Program (VSRP)
	A Master's student from China University of Petroleum, Beijing Period: September – December 2014.
Yuansi Tian	Visiting intern student with Visiting Student Research Program (VSRP)
	A Master's student from Xi'an Jiaotong University Period: September – December 2014.
Abdullah Dada	Research intern with KAUST Gifted Student Program
	Research topic: subcooled boiling project Period: June 11 – July 13, 2014
Majed Almubarak	Research intern with Saudi Research Science Institute (SRSI) 2014 program
	Research topic: a simple discrete model of subsurface flow Period: June 11 – July 24, 2014.
Da-Eun Yoo	Visiting intern student with Visiting Student Research Program (VSRP)
	A Master's student from Université Pierre et Marie Curie, Paris Period: May – August 2014.
Moustapha Abass	Visiting intern student with Visiting Student Research Program (VSRP)
	A Master's student from Université Pierre et Marie Curie, Paris Period: May – August 2014.
Redouane Meftah	Visiting intern student with Visiting Student Research Program (VSRP)
	A Master's student from Université Pierre et Marie Curie, Paris Period: May – August 2014.
Michael Lieb	Visiting intern student
	A PhD student from Technical University of Munich (TUM) Period: November 15 – December 15, 2011.

Serving Thesis Committees at KAUST (excluding as Thesis Advisor)

Yu-Jeong Kim	PhD student in Mechanical Engineering
Yuan Li	PhD student in Mechanical Engineering
Adel Fernando Sarmiento Rodriguez	PhD student in AMCS
	Thesis: "Structure-preserving methods for the Navier-Stokes-Cahn-Hilliard system to model immiscible fluids", defended in Room 5209, Building 5, from 3:30pm – 5:30pm on Sunday October 22, 2017 (Thesis committee members: Matteo Parsani, Victor Manuel Calo, S. Sun, Yalchin Efendiev, and David Keyes)
Roberto Machado Velho	PhD student in Applied Mathematics and Computational Science
	Thesis: "Finite-state mean-field games, crowd motion problems, and its numerical methods", defended from 2:00pm – 4:00pm on Wednesday July 26, 2017 (Thesis committee members: Diogo Gomes, S. Sun, Raul F. Tempone, and Maurizio Falcone; S. Sun joined via Skype)
Moataz Mohamad Alghamdi	Master's student in Applied Math & Computational Science

- Thesis: “A symbolic approach to finding permutation and parity symmetries of evolution equations”, defended in Room 4214, Building 1, from 1:00pm – 3:00pm on Wednesday June 7, 2017 (Thesis committee members: Diogo Gomes, S. Sun, and Matteo Parsani)
- Naila Raboudi Master’s student in Earth Science and Engineering
Thesis: “A new deterministic Ensemble Kalman Filter with one-step-ahead smoothing for storm surge forecasting”, defended in Room 4214, Building 1, from 10:30am – 12:30pm on November 22, 2016 (Thesis committee members: Ibrahim Hoteit, S. Sun, Omar M Knio, and Boujemaa Ait-El-Fquih)
- Mohammad Mujtaba Mansoor PhD student in Mechanical Engineering
Thesis: “On the impact of spheres onto liquid pools and ultra-viscous films”, defended in Room 5209, Level 5, Building 4, KAUST, 4:00-6:00pm, Sunday June 12, 2016 (Thesis committee members: Aamir Farooq, Sigurdur T. Thoroddsen, S. Sun, and Lorenz W. Sigurdson)
- Meixia Shi PhD student in Environmental Science and Engineering
Thesis: “Structural study and modification of support layer for forward osmosis membranes”, defended in Room 5209, Level 5, Building 4, KAUST, 2:00-4:00pm, Wednesday June 1, 2016 (Thesis committee members: Suzana P. Nunes, Victor M. Calo, Kim Choon Ng, S. Sun, and Yan Wang)
- Ali Jasim Alabdulghani Master’s student in Chemical and Biological Engineering
Thesis: “Novel techniques to characterize pore size of porous materials”, defended in Room 5209, Level 5, Building 4, 12:00noon-2:00pm Wednesday April 27th, 2016 (Thesis committee members: Zhiping Lai, Mani Sarathy and S. Sun)
- Sanzhong Zhang PhD student in Earth Science and Engineering
Thesis: “Multiscale seismic inversion in the data and image domains”, defended in the Omni Houston Hotel, 13210 Katy Freeway, Houston, Texas, 7:00am -9:30am, Tuesday, February 2, 2016 (Thesis committee members: Gerard Schuster, S. Sun, Ying Wu, Yi Luo, and Sherif Mahmoud)
- Lulu Liu PhD student in Applied Mathematics and Computational Science
Thesis: “Nonlinear preconditioning and its application in multicomponent problems”, defended in Room 4214, Level 4, Building 1, 3:00pm - 5:00pm, Thursday October 29, 2015 (Thesis committee members: David Keyes, S. Sun, Ravi Samtaney, and Rolf Krause)
- Ali Al-Shehri PhD student in Chemical and Biological Engineering
Thesis: “Membrane modeling, simulation and optimization for propylene/propane separation”, defended in Room 5220, Level 5, Building 4, 10:30am - 12:30pm, June 16, 2015 (Thesis committee members: Zhiping Lai, Ingo Pinnau, S. Sun, and Ali Abbas)
- Mohamad Elgharamti PhD student in Earth Science and Engineering
Thesis: “Data assimilation for management of industrial groundwater contamination at a regional scale”, defended in Room 5209, Level 5, Building 4, 4:00pm - 6:00pm, Wednesday November 19, 2014 (Thesis committee members: Ibrahim Hoteit, Johan Valstar, Omar M Knio, Youssef Marzouk, and S. Sun)
- Adil Siripatana Master’s student in Earth Science and Engineering
Thesis: “Bayesian inference of Manning’s n coefficient of a storm surge model: an ensemble Kalman filter vs. a polynomial chaos-based MCMC”, defended on July 17, 2014 (Thesis committee members: Ibrahim Hoteit, Omar M Knio, Olivier P Le Maitre, and S. Sun)
- Longfei Gao PhD student in Applied Mathematics and Computational Science
Thesis: “Kronecker products on preconditioning”, defended in Room 3119, Level 3, Building 1, 5:00pm - 7:00pm, Sunday September 8, 2013 (Thesis committee members: Victor Calo, Yalchin Efendiev, David Keyes, and S. Sun)
- Fabio Ravanelli Master’s student in Earth Science and Engineering
Thesis: “History matching of time-lapse data attributes using the ensemble Kalman filter”, defended in Room 3119, Level 3, Building 1, 1:00pm-3:00pm, Monday May 13, 2013 (Thesis committee members: Ibrahim Hoteit, Tariq A. Alkhalifah, and S. Sun)
- Ge Zhan PhD student in Earth Science and Engineering
Thesis: “Reverse-time migration in tilted transversely isotropic media with decoupled equations”, defended in Room 3119, Building 1, KAUST, 4:00-6:00pm, Tuesday December 11, 2012 (Thesis committee members: Gerard Schuster, Ying Wu, and S. Sun)

- Beshir Aman Master's student in Earth Science and Engineering
Thesis: "Reservoir history matching using ensemble Kalman filters with anamorphosis transforms", defended in Room 3422, Building 1, KAUST, 11:00am-12:30pm, Sunday December 9, 2012 (Thesis committee members: Ibrahim Hoteit, Tareq AlNaffouri, Marco Scavino, and S. Sun)
- Wei Dai PhD student in Earth Science and Engineering
Thesis: "Multisource least-squares reverse time migration", defended in Room 3119, Building 1, KAUST, 4:30-6:00pm, Saturday November 24, 2012 (Thesis committee members: Gerard Schuster, Martin Mai, Ying Wu, and S. Sun)
- Pedro Moy Master's student in Earth Science and Engineering
Thesis: "Performance analysis of high-order numerical methods for time-dependent acoustic field modeling", defended in Room 3422, Building 1, KAUST, 3:00-4:30pm, Monday July 30, 2012 (Thesis committee members: Victor M. Calo, Yalchin Effendiev, and S. Sun)
- Chandra Prasetyo Master's student in Computer Science
Thesis: "The hybrid of classification tree and extreme learning machine for permeability prediction in oil reservoir", defended in Conf. Room 4214, Building 1, KAUST, 2:00-3:00pm, June 18, 2011 (Thesis committee members: Mikhail Moshkov, Basem Shihada, and S. Sun)

Serving PhD Qualifying Examination Committees at KAUST

Saleh F. Hassan	PhD student in ErSE, took exam on October 1st, 2017
Tao Zhang	PhD student in ErSE, took exam on October 1st, 2017
Ahmed Saad	PhD student in ErSE, took exam on Thursday March 2nd, 2017
Yiteng Li	PhD student in ErSE, took exam on Thursday March 2nd, 2017
Naila Raboudi	PhD student in ErSE, took exam on Thursday March 2nd, 2017
Rached Rached	PhD student in ErSE, took oral exam on Wednesday October 26, 2016
Adrian Garcia	PhD student in ErSE, took oral exam on Wednesday October 26, 2016
Diego Rojas Blanco	PhD student in ErSE, took oral exam on Sunday October 16, 2016
Dias Urozayev	PhD student in ErSE, took exam November 17, 2015
Adil Siripatana	PhD student in ErSE, took exam April 14, 2015
Sahar Amir	PhD student in ErSE, took exam September 11, 2014
Xiaolin Fan	PhD student in ErSE, took exam May 5, 2014
Ayrat Abdullin	PhD student in ErSE, took exam November 12, 2013
Klemens Katterbauer	PhD student in ErSE, took exam November 11, 2013
Rebecca Allen	PhD student in ErSE, took exam November 20, 2012
Jerry Raj	PhD student in ErSE, took exam 2-4pm October 2, 2012
Ardiansyah Negara	PhD student in ErSE, took exam on September 4, 2012
Yuanqing Wu	PhD student in CS, took exam on May 19, 2012
Ahmad Kadoura	PhD student in ErSE, took exam on May 6, 2012
Mohamad Elgharamti	PhD student in ErSE, took exam on February 13, 2012
Xuxin Ma	PhD student in ErSE, took exam in October 2011
Ge Zhan	PhD student in ErSE, took exam in May 2011
Xin Wang	PhD student in ErSE, took exam in April 2011
Sanzong Zhang	PhD student in ErSE, took exam in April 2011
Wei Dai	PhD student in ErSE, took exam in April 2011

Supervision of Graduate Students at KAUST as Faculty Supervisor of Internship

Ardiansyah Negara	Summer 2014 (The Ohio State University)
Ahmad Kadoura	Summer 2013 (Schlumberger Oil Company, KSA)
Ibrahim Gawish	Summer 2013 (UT-Austin)
Rebecca Allen	Summer 2012 (OCCAM, University of Oxford, UK)
Zhiwei Ma	Summer 2012 (King Fahd Univ of Petroleum & Minerals)
Ardiansyah Negara	Summer 2012 (Saudi Aramco Oil Company, Dhahran)
Waqas Khan	Summer 2011 (Schlumberger Oil Company, Dhahran)
Sebastian Saavedra	Summer 2011 (PEMEX, Mexico Oil Company)
Rayan Alghanim	Summer 2011 (Saudi Aramco Oil Company, Dhahran)

Massab Junaid	Summer 2011 (Engro Fertilizers, previously Exxon Mobil)
Lautaro Rayo	Summer 2011 (Schlumberger Oil Field Plc., Abingdon, UK)
Hossam Osman	Summer 2011 (Saudi Aramco Oil Company, Dhahran)
Ardiansyah Negara	Summer 2011 (Colorado State University, Fort Collins)
Guilherme Blaitterman Ribeiro Jr	Summer 2010 (University of Calgary, Canada)
Mohamad Elgharamti	Summer 2010 (University of Texas at Austin)
Ardiansyah Negara	Summer 2010 (Schlumberger Oil Company)

Supervision of Graduate Students at Clemson University as Thesis Advisor

- Pu Song** Master's student in computational mathematics. 2008 – 2010.
Thesis: "Contaminant flow and transport simulation in cracked porous media using locally conservative schemes", defended in Martin Hall M301, Clemson University, 9:00-10:00am, July 21, 2010.
(Thesis committee members: S. Sun, Leo Rebholz, and Jeong-Rock Yoon)
First position after graduation: PhD student, University of Pittsburgh, USA
- Chen Dong** Master's student in computational mathematics. 2008 – 2010.
Thesis: "Numerical modeling of contaminant transport in fractured porous media using mixed finite element and finite volume methods", defended in Martin Hall M301, Clemson University, 9:00-10:00am, July 19, 2010.
(Thesis committee members: S. Sun, Vincent Ervin, and Eleanor Jenkins)
First position after graduation: PhD student, University of Maryland, College Park, USA

Supervision of Graduate Students at Clemson University as Research Project Supervisor

- Jiayu Zhang** Graduate student in math (RA on multiscale angiogenesis modeling). 2007.

Serving Thesis Committees at Clemson University (excluding as Thesis Advisor)

- Thilo Strauss** PhD student in mathematics (defended proposal on April 10, 2014)
Advised by Taufiqur Khan, 2011 – Present.
- Ricky Farr** Master's student in mathematics.
Thesis: "Approximation of fractional advection dispersion equations by hierarchical matrix methods", defended in Martin Hall 0-10, Clemson University, 10:30 am, July 13, 2009.
(Thesis committee members: Vincent Ervin, Chris Cox, and S. Sun)

Supervision of Undergraduate Students at Clemson University as Research Project Supervisor

- Meaghan Riemer** Undergraduate student in math (Creative inquiry project on neuron growth; co-advised with Prof. Delphine Dean). 2007 - 2010.
- Courtney Taylor** Undergraduate student in bioengineering (Creative inquiry project on neuron growth; co-advised with Prof. Delphine Dean). 2009 - 2010.

Supervision of Graduate Students at Other Universities as Thesis Advisor

- Yahong Xiang (向亚红)** Master's student, Guizhou University, China
September 2017 – August 2020.
- Guocan Chen (陈国灿)** Master's student, Guizhou University, China
September 2016 – August 2019.
- Xiaoyu Feng (冯晓宇)** Master's student, China University of Petroleum (Beijing)
September 2015 – August 2018.
- Xiaoyu Zhang (张校域)** Master's student, Guizhou University, China
September 2015 – August 2018.
- Tao Zhang (章涛)** Master's student, China University of Petroleum (Beijing)

September 2013 – August 2016.

Thesis: “Study on the direct numerical simulation of oil-water two phase flow” (油水两相流的直接数值模拟), defended in China University of Petroleum (Beijing), China, Defended 1:00-1:30pm May 30, 2016.

First position after graduation: PhD student, KAUST

Jiangyong Hou (侯江勇) PhD student in math, Xi’an Jiaotong University

Co-advised with Prof. Zhangxing Chen, September 2010 – Present

First position after graduation: Assistant Professor, Northwestern Polytechnical Univ, China

Xiaolin Fan (范小林) Master’s student in mathematics, Guizhou University, China,

co-advised with Dean & Prof. Wei Wei, September 2009 – June 2011.

Thesis: “Mathematical models and numerical simulation of flow processes in Karst aquifers”, defended in Guizhou University, Guiyang, 9:00 am, Tuesday June 7, 2011.

(Thesis committee members: Wei Wei, S. Sun, Fu-Rong Xu, Yi-Du Yang, Ming Zhao, Hui Yang, and Min-Qing Gong)

First position after graduation: Lecturer, Guizhou Medical College, Guiyang, China

Serving as an external examiner of Master’s thesis

Kelechi Sabinus Eze Master’s student, Institute of Petroleum Engineering

Heriot-Watt University, Edinburgh EH14 4AS, Scotland, UK

Date of Thesis Submission: December 2016

Thesis: “Pore-scale modelling of in situ geochemical reactions”

Serving as an external examiner of PhD thesis

Jalim Singh PhD candidate, School of Basic Sciences,

Indian Institute of Technology Mandi (IIT Mandi),

Kamand, Mandi-175005, India. Thesis submitted in December 2017.

Thesis: “Microscopic structure and dynamics of glass transition under phase separation in a model linear polymer melt”

Jingzhe Li (李景哲) PhD candidate, College of Resources Science and Technology

Beijing Normal University, China. Defended 10:20-11:20am May 30, 2016.

Thesis: “惠州凹陷南部K系列层序地层结构与油气分布研究” (Sequence Stratigraphy and Hydrocarbon Distribution of K-Successions of the Southern Part of Huizhou Depression, China”

Rui Wang (王瑞) PhD candidate, Program of Oil-Gas Field Development Engineering,

China University of Petroleum, Beijing, December 2015.

Thesis: “页岩储层气体吸附与扩散影响因素及规律研究” (Influencing factors of gas adsorption and diffusion on shales).

Jie Chen (陈洁) PhD candidate, School of Physical and Mathematical Sciences,

Nanyang Technological University (NTU), Singapore, 2011.

Thesis: “Linear finite element superconvergence on simplicial meshes”.

SPONSORED RESEARCH

- 1) Principal Investigator, “Modeling of Methane and Peroxide By-Product Release for Polyolefin-based Crosslinked Cables”, funded by The Dow Chemical Company, January 1, 2018 – December 31, 2020 (P.I.: S. Sun). Grant amount: US\$983,717.00. SAP Grant Number: RGC/3/3560-01.
- 2) Principal Investigator, “pH-Responsive Polyelectrolytes: Monte Carlo Simulation and Self-Consistent Field Theory”, funded by KAUST’s Competitive Research Grants (CRG) program, April 1, 2017 – March 31, 2019 (P.I. at KAUST: S. Sun, P.I. at University of Texas at Austin: V.

- Ganesan). Grant amount: US\$400,000.00 (Grant to KAUST side: US\$240,000.00). SAP Grant Number: URF/1/2993-01.
- 3) Co-Principal Investigator, “Fractional Diffusion Modeling of Transport in the Environment”, funded by the KAUST-KFUPM Initiative (KKI) program, July 1, 2016 – June 30, 2019. (P.I. at KAUST: O. Knio; Co-P.I. at KAUST: S. Sun, D. Keyes, D. Ketcheson, M. Laleg-Kitari; PIs at KFUPM: K. Mustapha, K. Furati) Pocket ID: REP/1/2879-01-01. (Grant to KAUST side: US\$750,000.00).
 - 4) Principal Investigator, “Shale Reservoirs: Modeling, Theory, Experiments and Molecular Flow Simulations”, funded by Saudi Aramco Oil Company (SAP Grant Number: RGC/3/2053-01), April 1, 2015 – March 31, 2018. (P.I.: S. Sun, co-P.I.: Z. Lai, sub-award P.I.: A. Firoozabadi). Grant amount: US\$1,599,933.00.
 - 5) Principal Investigator, “Simulation of Subsurface Geochemical Transport and Carbon Sequestration”, funded by KAUST’s GRP-AEA Program, September 1, 2011 – August 31, 2015 (P.I. at KAUST: S. Sun, P.I. at UT-Austin: M. F. Wheeler; Co-P.I.: I. Hoteit, and T. Arbogast, and M. Hesse). Grant amount: US\$3,001,331.92 (Grant to KAUST side: US\$1,200,070.00).
 - 6) Lead PI (Lead Principal Investigator) at KAUST side, “Micro/nanofluidics”, the one-year extension of the award for research collaboration between HKUST (Hong Kong University of Science and Technology) and KAUST, funded by KAUST’s Special Academic Partnership Program, September 1, 2013 – August 31, 2014 (Lead PI at KAUST: S. Sun; other PI’s at KAUST: Jurgen Kosel, Ian Foulds, Peng Wang; Lead PI at HKUST: Weijia Wen, other PI’s at HKUST: Ping Sheng, Xiao-Ping Wang, Tiezheng Qian, Yi-Kuen Lee, and Wenjing Ye).
 - 7) Principal Investigator, “New Electro-Magneto-Mechano Processes for Non-invasive Interior Healing of Damaged Piping Systems”, funded by KAUST’s OCRF Program, (PID number: 7000000098), July 1, 2013 – June 30, 2014 (P.I. at KAUST: S. Sun, P.I. at University of California at Berkeley: Tarek I. Zohdi). Grant amount: US\$300,000.00 (KAUST side) and US\$300,000.00 (UC-Berkeley side).
 - 8) Principal Investigator, “High Performance Visual Computing”, funded by KAUST’s OCRF Program, October 1, 2012 – September 30, 2014 (P.I. at KAUST: S. Sun, P.I. at TUM (Technische Universität München): Hans-Joachim Bungartz). Grant amount: US\$353,000.00 (KAUST side) and US\$ 1,588,436.07 (TUM side).
 - 9) Co-Principal Investigator, “Multi-scale, multi- physics simulation and uncertainty quantification for porous media processes and applications (MMUPA)”, funded by KAUST Strategic Research Initiative (SRI) competitive funding program. (P.I. at Texas A&M: Yalchin Efendiev; P.I. at KAUST: Victor M. Calo).
 - 10) Principal Investigator, "Parallel Multiscale Simulation of Multicomponent Multiphase Flow: From Darcy Scale to Molecular Scale", funded by KAUST’s GRP University Research Funds (URF) KAUST-IBM Program, January 9, 2012 – January 8, 2013. (P.I. at KAUST: S. Sun, P.I. at IBM: K. Jordan). Grant amount: US\$325,000.00 (Total project budget US\$650,000.00).
 - 11) Principal Investigator, “Evaluation of Sulfur Solubility in Natural Gas with Molecular Simulation”, funded by Saudi Aramco Oil Company (Contract #: 6600024505; REL PO #: 6510454094; Pocket ID: 3000000121), January 15, 2011 – January 14, 2013. Grant amount: US\$399,372.
 - 12) Co-Principal Investigator, Center for Subsurface Imaging and Fluid Modeling consortium (CSIM), Industrial Affiliates Program for Oil Companies, (P.I.: Gerard Schuster), September 2009 — Present. Grant amount: US\$250,000 each year (with US\$25,000 from each of 10 oil companies consisting of Saudi Aramco, British Petroleum, CGG, Chevron, PEMEX, Petrobras, TOTAL, Tullowoil, WesternGeco, and TGS).
 - 13) Principal Investigator, “The Modeling and Simulation of Two-Phase Flow in Porous Media: From Pore Scale to Darcy Scale”, funded by KAUST’s GRP-CF (Global Research Partnership Collaborative Fellows) Program to support one postdoctoral collaborative fellow jointly hired by KAUST and HKUST, January 5, 2011 – January 4, 2014. Grant amount: US\$61,250 (Shuyu Sun at KAUST) and about HK\$600,000 (Xiao-Ping Wang at HKUST).

- 14) Principal Investigator, “Study of Sulfur Solubility using Thermodynamics Model and Quantum Chemistry”, funded by KACST (the Saudi Arabian national science agency, equivalent to NSF in US), August 30, 2011 – August 29, 2012. Grant amount: SAR 185,000.
- 15) Principal Investigator, “Modeling Multi-Component Phase Equilibrium of Reservoir Fluids with Molecular Simulation”, funded by Saudi Aramco Oil Company, (Project #: 3000000001; Pocket ID: 3000000021; CRPO #: 6510435957), July 12, 2010 – July 11, 2012. Grant amount: US\$334,200.
- 16) Principal Investigator, KAUST faculty Baseline Research Fund (BRF), funded by KAUST, August 2009 – August 2014. Grant amount: US\$2,000,000.
- 17) Principal Investigator, “Proof-of-Concept Model for the Cementitious Barrier Partnership”, funded by U.S. Department of Energy through SCUREF – Savannah River National Laboratory, May 2009 – August 2010. Grant amount: US\$105,776.
- 18) Co-Principal Investigator, “Multi-scale Modeling, Analysis and Optimization of Energy Supply Chains,” funded by National Science Foundation of China (contract number: 70871077), January 2009 – December 2011, (P.I.: Ming Dong). Grant amount: 249,000 RMB.
- 19) Co-Principal Investigator, “Multi-Scale Modeling and Optimization for Distributed Multi-Entrant Complex Manufacturing Systems,” funded by National High-Tech Research and Development Program (863 Program) of China (contract number: 2008AA04Z104), January 2008 – December 2010, (P.I.: Ming Dong). Grant amount: 640,000 RMB.
- 20) Principal Investigator, “*In Silico* Modeling of Tissue Angiogenesis,” funded by Research Grant Committee, Clemson University, December 2006 – August 2007. Grant amount: US\$3,325.
- 21) Principal Investigator, “MACOBE: Mathematical Modeling of Neuron Cell Growth,” funded by Creative Inquiry Projects Committee, Clemson University, August 2007 – August 2010. (P.I.’s: Delphine Dean and S. Sun).
- 22) Principal Investigator, Clemson University faculty start-up research grant, funded by Clemson University, August 2006 – August 2008. Grant amount: US\$45,959.
- 23) Investigator, “Computational Modeling of Angiogenesis,” University of Texas M. D. Anderson Biomedical Engineering Seed Grant, September 2003 – September 2004, (P.I.: Mary F. Wheeler). Grant amount: US\$10,000.
- 24) Investigator, “Focused Effort on Error Estimators/Indicators for Environmental Quality Modeling”, funded by U.S. Department of Defense (High Performance Computing Modernization Program), (P.I.: Mary F. Wheeler), September 2002 – September 2003. Grant amount: US\$139,625.
- 25) Investigator, “A Data Intense Challenge: the Instrumented Oilfield of the Future,” funded by U.S. National Science Foundation (Information Technology Research program), 2001-2002, (P.I.: Mary F. Wheeler). Grant amount: US\$2,150,000 (\$260,000 for Wheeler’s team).
- 26) Investigator, “Coupling of Models for Energy and Environment,” NPACI Alpha Project, funded by NPACI of U.S., 2001 – 2002, (P.I.: Mary F. Wheeler). Grant amount: US\$290,000.

EDITORIAL SERVICE

- 1) Guest Editor (guest editing with Professor Ivan Yotov), a special issue of CMAME (*Computer Methods in Applied Mechanics and Engineering*) on “Advances in Simulations of Subsurface Flow and Transport”, 2013 – 2015. | Journal website: <http://www.journals.elsevier.com/computer-methods-in-applied-mechanics-and-engineering/> Special Issue website: <http://www.sciencedirect.com/science/journal/00457825/292>
- 2) Associate Editor, *Computational Geosciences*, June 2015 – Present. | Journal ISSN: 1420-0597 (Print) 1573-1499 (Online); Journal website: <http://link.springer.com/journal/10596>

- 3) Associate Editor, *Advances in Applied Mathematics and Mechanics (AAMM)*, April 2010 – Present. | Journal ISSN: 2070-0733, E-ISSN: 2075-1354; Journal website: <http://www.global-sci.org/aamm/> (before 2014), now at: <http://journals.cambridge.org/AAM>
- 4) Associate Editor, *International Journal of Numerical Analysis & Modeling (IJNAM)*, January 2016 – Present. | Journal ISSN 1705-5105; Journal website: <http://www.math.ualberta.ca/ijnam/>
- 5) Member of Editorial Board, *International Journal of Numerical Analysis & Modeling, Series B (IJNAMB)*, February 2010 – Present. | Journal ISSN: 1923-2950, E-ISSN: 1923-2950; Journal website: <http://www.math.ualberta.ca/ijnamb/>
- 6) Lead Guest Editor (guest editing with Professors Jianzhong Lin and Mohamed Fathy El-Amin), Abstract and Applied Analysis special issue on “Mathematical and Computational Analyses of Flow and Transport Phenomena 2015”, 2014 – 2015. | Journal ISSN: 1085-3375 (Print), ISSN: 1687-0409 (Online); Journal website: <http://dx.doi.org/10.1155/4058>
- 7) Lead Guest Editor (guest editing with Professors Jianzhong Lin and Mohamed Fathy El-Amin), Abstract and Applied Analysis special issue on “Mathematical and Computational Analyses of Flow and Transport Phenomena”, 2013 – 2014. | Journal ISSN: 1085-3375 (Print), ISSN: 1687-0409 (Online); Journal website: <http://dx.doi.org/10.1155/4058>
- 8) Guest Editor (guest editing with Professors Bo Yu, Yuxing Li, Xiaoyan Liu, Paulo R. de Souza Mendes, and John C. Chai), *Advances in Mechanical Engineering* special issue on “Advances in Petroleum Storage and Transportation Engineering”, 2013 – 2014. | Journal ISSN: 1687-8132 (Print), ISSN: 1687-8140 (Online); Journal website: <http://dx.doi.org/10.1155/5263>
- 9) Guest Editor (guest editing with Professors Bo Yu, Jinjia Wei, Dongliang Sun, Yi Wang, and Weihua Cai), *Advances in Mechanical Engineering* special issue on “Numerical Simulation of Fluid Flow and Heat Transfer Processes 2014”, 2013 – 2014. | Journal ISSN: 1687-8132 (Print), ISSN: 1687-8140 (Online); Journal website: <http://dx.doi.org/10.1155/5263>
- 10) Guest Editor (guest editing with Professors B. Yu, T. Kunugi, T. Tagawa, M. Wang, and Y. Wang), *Advances in Mechanical Engineering* special issue on “Numerical Simulation of Fluid Flow and Heat Transfer Processes”, 2012 – 2013. | Journal ISSN: 1687-8132 (Print), ISSN: 1687-8140 (Online); Journal website: <http://dx.doi.org/10.1155/5263>
- 11) Lead Guest Editor (guest editing with Professors Bo Yu and Mohamed Fathy El-Amin), *Journal of Applied Mathematics* special issue on “Mathematical and Numerical Modeling of Flow and Transport 2013”, 2012 – 2014. | Journal ISSN: 1110-757X, E-ISSN: 1687-0042; Journal website: <http://dx.doi.org/10.1155/4185>
- 12) Lead Guest Editor (guest editing with Professors Zhangxing John Chen, Hiroshi Kanayama, and Mohamed F. El-Amin), *Journal of Applied Mathematics* special issue on “Mathematical and Numerical Modeling of Flow and Transport 2012”, 2011 – 2012. | Journal ISSN: 1110-757X, E-ISSN: 1687-0042; Journal website: <http://dx.doi.org/10.1155/4185>
- 13) Lead Guest Editor (guest editing with Professors Zhangxing John Chen, Lea Jenkins, and Juergen Geiser), *Journal of Applied Mathematics* special issue on “Mathematical and Numerical Modeling of Flow and Transport”, 2010 – 2011. | Journal ISSN: 1110-757X, E-ISSN: 1687-0042; Journal website: <http://dx.doi.org/10.1155/4185>

HONORS, AWARDS AND RECOGNITIONS

◆ The Best Paper Award, The 2014 International Conference of Applied and Engineering Mathematics, London, UK, July 2-4, 2014. Awarded from International Association of Engineers (IAENG). Paper titled “An efficient scheme for two-phase flow in porous media including dynamic capillary pressure.”

◆ Best Poster Award, “Investigation of non-invasive healing of damaged piping system using electro-magneto-mechanical methods”, SPE International Oil Field Corrosion Conference and Exhibition, May 12-13, 2014, Aberdeen, UK.

◆ Certification from SPE recognizing him as “serving exceptionally well as Student Chapter Faculty Advisor” for KAUST Student Chapter, July 26, 2013.

◆ J. T. Oden Research Faculty Fellowship recipient, The University of Texas at Austin, 2008 and 2009

◆ Congress Fellowship, U.S. National Congress on Computational Mechanics, 2005

◆ Best paper award, International Conference on Computing, Communication and Control Technologies, 2005

◆ NSF fellowship for the NSF Summer Institute on Nano Mechanics and Materials, June 20 – 24, 2005

◆ Nominations for Burroughs Wellcome Career Awards at the Scientific Interface, The University of Texas at Austin, 2004 and 2005

◆ Postdoctoral Fellowship, The University of Texas at Austin, 2003 – 2005

◆ Full member (elected), Sigma Xi (the Scientific Research Society), 2003 – Present

◆ Member, Tau Beta Pi (the Engineering Honor Society), 2003 – Present

◆ Member, the Honor Society of Gamma Beta Phi, 2003 – Present

◆ Research Assistantship, The University of Texas at Austin, 1999 – 2003

◆ University of Texas Fellowship, The University of Texas at Austin, 1999 – 2000

◆ Member, the Honor Society of Phi Kappa Phi, 1999 – Present

◆ First-class Wang Kechang Scholarship, Tianjin University, China, 1996

◆ Best Master’s Thesis Award, Tianjin University, China, 1994

◆ University Awards for Best Academic Performance, Tianjin University, China, 1990 and 1993

◆ Best Undergraduate Thesis Award, Tianjin University, China, 1991

CONFERENCES / WORKSHOPS / MINISYMPOSIUMS ORGANIZED

- 1 Co-Chair (with Mojdeh Delshad, Andro Mikelic, Pania Newell, Guglielmo Scovazzi, and Ivan Yotov) a special mini symposium, within USACM (United States Association for Computational Mechanics)'s 15th U.S. National Congress on Computational Mechanics (USNCCM15) conference, Austin, Texas, USA, July 2019.
- 2 Chair (with Jianguo James Liu and Jingfa Li), *International Workshop on Simulations of Flow and Transport: Modeling, Algorithms and Computation – SOFTMAC 2018*, within the International Conference on Computational Science (ICCS 2018 with theme: “Science at the Intersection of Data, Modelling and Computation”), Wuxi, China, 11-13 June, 2018. | URL: <https://www.iccs-meeting.org/iccs2018/>
- 3 Chair (with Jun Yao), the minisymposium “Modeling and simulation of subsurface flow at various scales”, in the Interpore 10th Annual Meeting and Jubilee Conference, New Orleans, May 14-17, 2018. | URL: <https://www.interpore.org/events>
- 4 Chair (with Jianguo James Liu), *International Workshop on Simulations of Flow and Transport: Modeling, Algorithms and Computation – SOFTMAC 2017*, within the International Conference on Computational Science (ICCS 2017), Zürich, Switzerland, 12-14 June, 2017. | URL: <http://www.iccs-meeting.org/iccs2017/>
- 5 Chair, *Modeling and Computation for Flow and Transport in Porous Media*, an invited workshop within ECM2017 (The 3rd International Conference on Engineering and Computational Mathematics), held in The Hong Kong Polytechnic University in Hong Kong from May 31 – June 2, 2017. | URL: <http://www.polyu.edu.hk/ama/events/conference/ECM2017/>
- 6 Chair (with Jianguo James Liu and Meng-Huo Chen), *International Workshop on Computational Flow and Transport: Modeling, Simulations and Algorithms*, within the International Conference on

- Computational Science (ICCS 2016), San Diego, California, USA, June 6-8, 2016. | URL: <http://www.iccs-meeting.org/iccs2016/>
- 7 Co-Chair (with Hong Wang and Hongxing Rui), the minisymposium “Advances in numerical methods for porous media flow” in the 8th International Congress on Industrial and Applied Mathematics (ICIAM 2015), Beijing, China, August 10 – 14, 2015. | URL: <http://www.iciam2015.cn/>
 - 8 Chair (with Jianguo James Liu), the minisymposium “*Modeling and Numerics for Flow and Transport in Porous Media*” in the 2015 SIAM Conference on Mathematical and Computational Issues in the Geosciences (GS15), to be held on Stanford University, Stanford, California, USA, June 29 – July 2, 2015. | URL: <http://www.siam.org/meetings/gsl5/>
 - 9 Chair (with Jianguo James Liu and Hua Zhong), *International Workshop on Computational Flow and Transport: Modeling, Simulations and Algorithms*, within the International Conference on Computational Science (ICCS 2015), Reykjavik, Iceland, June 1-3, 2015. | URL: <http://www.iccs-meeting.org/iccs2015/>
 - 10 Co-Chair (with M.F. ElAmin and A. Salama), *Modeling and Simulation of Nanoparticles Transport in Porous Media*, a minisymposium of the 7th International Conference on Porous Media (INTERPORE7), to be held in Padova, Italy, 18-21 May 2015. | URL: <https://www.interpore.org/events/7th-international-conference-on-porous-media-annual-meeting>
 - 11 Session Moderator, *Upstream Petroleum Symposium*, the Conference Building (Building 19), KAUST, Thuwal, Saudi Arabia, November 13-14, 2014. | URL: <http://www.kaust.edu.sa/events/upstream-petroleum/index.html>
 - 12 Co-Chair (with Yalchin Efendiev), *Multiscale and Multiphysics Simulations of Flow and Transport in Porous Media: Invited Session in Honor of Mary Wheeler*, a minisymposium of the 6th International Conference on Porous Media (InterPore 2014), Milwaukee, 27-30 May 2014. | URL: <https://www.interpore.org/events/6th-international-conference-on-porous-media-annual-meeting>
 - 13 Co-Chair (with Todd Arbogast), *Physics-Preserving Numerical Methods for Subsurface Geochemical Transport Processes*, a minisymposium in the 6th International Conference on Porous Media (InterPore 2014), Milwaukee, 27-30 May 2014. | URL: <https://www.interpore.org/events/6th-international-conference-on-porous-media-annual-meeting>
 - 14 Chair, *Computational mathematics for oil and gas applications* (an invited workshop in Honor of Prof. Mary F. Wheeler's 75th Birthday), within ECM2013 (The 2nd International Conference on Engineering and Computational Mathematics), held in The Hong Kong Polytechnic University in Hong Kong from December 16-18, 2013. | URL: <http://www.polyu.edu.hk/ama/events/conference/ECM2013/>
 - 15 Co-Chair (with R. Farajzadeh, J. Mikyska, H. Ott, and M. Wheeler) *Multiphase/compositional simulation with applications in enhanced oil recovery, CO2 sequestration, nuclear waste storage and others*, a minisymposium in the 5th International Conference on Porous Media (InterPore 2013), Prague, Czech Republic, May 21-24, 2013. | URL: <https://www.interpore.org/events/5th-international-conference-on-porous-media-annual-meeting>
 - 16 Chair (with Jianguo James Liu), *International Workshop on Flow and Transport: Modeling, Simulations and Algorithms*, within the International Conference on Computational Science (ICCS 2013), Barcelona, Spain, June 5 - June 7, 2013. | URL: <http://www.iccs-meeting.org/iccs2013/>
 - 17 Member, Organizing Committee, Symposium on Geophysical Flows (地球物理流动学研讨会), Xi'an Jiaotong University, Xi'an, China, July 22-24, 2012.
 - 18 Chair (with Jianguo James Liu), *International Workshop on Flow and Transport: Modeling, Simulations and Algorithms*, within the International Conference on Computational Science (ICCS 2011), Omaha, Nebraska, USA, June 4 – 6, 2012. | URL: <http://www.iccs-meeting.org/iccs2012/>
 - 19 Co-Chair (with Taufiqar Khan), the minisymposium of “Computational Challenges in Statistical Inverse Problems Arising in Applications”, the Conference of *Inverse Problems: Modeling and Simulation 2012*, Antalya, Turkey, May 21 – 26, 2012.
 - 20 Chair (with Jianguo James Liu), *International Workshop on Flow and Transport: Computational Challenges*, within the International Conference on Computational Science (ICCS 2011), Nanyang Technological University, Singapore, June 1 - June 3, 2011. | URL: <http://www.iccs-meeting.org/iccs2011/>
 - 21 Chair (with Ibrahim Hoteit), the minisymposium of “Simulation, Optimization and Assimilation of Subsurface Reservoirs” in the 2011 SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS11), Long Beach, California, March 21-24, 2011. | URL: <http://www.siam.org/meetings/gsl1/>

- 22 Organizer, the 2010 KAUST WEP Workshop (WE 245) on “Advanced Finite Element Methods with Applications in Numerical Reservoir Simulation”, Building 9, Room 4125, KAUST, Thuwal, Saudi Arabia, January 30 - February 1, 2010. | Invited speakers include Mary Wheeler (UT-Austin), Tao Tang (Hong Kong Baptist Univ), Ivan Yotov (U of Pittsburgh), Todd Arbogast (UT-Austin), Zhangxing (John) Chen (University of Calgary), and Guangri (Gary) Xue (UT-Austin); Workshop webpage at <http://web.kaust.edu.sa/faculty/shuyusun/FEM2010>
- 23 Chair (with Lea Jenkins) the minisymposium of “Computational issues in porous media flows” in the 33rd SIAM Southeastern-Atlantic Section Annual Meeting, University of South Carolina, Columbia, South Carolina, April 4-5, 2009.
- 24 Organizer, Computational Mathematics Seminar, Department of Mathematical Sciences, Clemson University, Clemson, South Carolina, USA, August 2006 – August 2008. | Computational Mathematics Seminar webpage at <http://people.clemson.edu/~shuyu/seminar>
- 25 Co-chair (with Alfons Hoekstra, Valeria Krzhizhanovskaya, Juergen Geiser), *the 4th International Workshop on Simulation of Multiphysics Multiscale Systems*, within the International Conference on Computational Science, Beijing, China, May 27-30, 2007. | URL: <http://www.iccs-meeting.org/iccs2007/>
- 26 Chair (with Mary F. Wheeler and Ivan Yotov), the minisymposium of “Multiscale and physics-preserving algorithms for multiphase flow, transport, and reaction in porous media” in the SIAM Conference on Mathematical & Computational Issues in the Geosciences, Santa Fe, New Mexico, March 19-22, 2007. | URL: <http://www.siam.org/meetings/gso7/>
- 27 Session chair, *the 3rd International Conference on Computing, Communication and Control Technologies (CCCT '05)*, Austin, Texas, July 24-27, 2005.
- 28 Organizer, the Weekly Graduate Student Seminar, the Center for Surface Modeling, the University of Texas at Austin, 2004-2005.

PUBLICATIONS

Papers in Refereed Archival Journals

- 1 J. Kou and S. Sun*, “Thermodynamically consistent modeling and simulation of multi-component two-phase flow model with partial miscibility,” *Computer Methods in Applied Mechanics and Engineering*, Volume 331, Pages 623–649, 1 April 2018. | URL: <https://arxiv.org/abs/1611.08622> and <https://doi.org/10.1016/j.cma.2017.11.023>
- 2 H. Yang, S. Sun, Y. Li, and C. Yang, “A scalable fully implicit framework for reservoir simulation on parallel computers”, *Computer Methods in Applied Mechanics and Engineering*, Volume 330, Pages 334-350, 1 March 2018. | URL: <https://doi.org/10.1016/j.cma.2017.10.016> and <http://hdl.handle.net/10754/626151>
- 3 J. Kou and S. Sun, “A stable algorithm for calculating phase equilibria with capillarity at specified moles, volume and temperature using a dynamic model”, *Fluid Phase Equilibria*, Volume 456, Pages 7-24, 25 January 2018. | URL: <http://doi.org/10.1016/j.fluid.2017.09.018> and <http://hdl.handle.net/10754/625527>
- 4 H. Chen, S. Sun, and T. Zhang, “Energy stability analysis of some fully discrete numerical schemes for incompressible Navier-Stokes equations on staggered grids”, *Journal of Scientific Computing*, Volume 75, Issue 1, pp 427–456, 2018. | URL: <https://doi.org/10.1007/s10915-017-0543-3> and <http://hdl.handle.net/10754/625751>
- 5 Y. Wang, S. Sun*, L. Gong, and B. Yu, “Global Mass Conservation Method for Dual-Continuum Gas Reservoir Simulation”, *Journal of Natural Gas Science & Engineering*, accepted, 2018.
- 6 K. Bao, A. Salama*, and S. Sun, “Flow split characterization of two immiscible phases with different wettability scenarios: a numerical investigation using a coupled Cahn-Hilliard and Navier-Stokes system”, *International Journal of Multiphase Flow*, accepted, 2018. | URL: <https://doi.org/10.1016/j.ijmultiphaseflow.2017.12.016>
- 7 S. Z. A. Amir and S. Sun*, “Physics-Preserving Averaging Scheme based on Grunwald-Letnikov Formula for Gas Flow in Fractured Media”, *Journal of Petroleum Science and Engineering*, accepted, 2018.

- 8 Nevena Perović*, Jérôme Frisch, Amgad Salama, Shuyu Sun, Ernst Rank, and Ralf-Peter Mundani, “Multi-scale high-performance fluid flow: Simulations through porous media”, *Advances in Engineering Software*, Volume 103, Pages 85-98, January 2017. | URL: <https://doi.org/10.1016/j.advengsoft.2016.07.016>
- 9 Mohamed El-Amin*, Jisheng Kou, and Shuyu Sun, “Mixed finite element simulation with stability analysis for gas transport in low-permeability reservoirs”, *Energies*, 11(1), 208, 2018. | URL: <https://doi.org/10.3390/en11010208>
- 10 Y. Wang, S. Sun*, and B. Yu, “Acceleration of gas flow simulations in dual-continuum porous media based on the mass-conservation POD method”, *Energies*, 10(9), 1380, 2017. | URL: <http://dx.doi.org/10.3390/en10091380>
- 11 M.F. El-Amin*, J. Kou, and S. Sun, “Discrete-fracture-model of multi-scale time-splitting two-phase flow including nanoparticles transport in fractured porous media,” *Journal of Computational and Applied Mathematics*, in press. | URL: <https://doi.org/10.1016/j.cam.2017.11.008>
- 12 Y. Wang and S. Sun, “Direct numerical simulation of noninvasive channel healing in electrical field”, *Advances in Mechanical Engineering*, Vol. 9(11), 1–10, 2017. | URL: <http://dx.doi.org/10.1177/1687814017723282>
- 13 A. Salama, M. F. El-Amin, K. Kumar and S. Sun, “Flow and transport in tight and shale formations: a review,” *Geofluids*, Volume 2017, Article ID 4251209, 21 pages, 2017. | URL: <https://doi.org/10.1155/2017/4251209>
- 14 A. K. N. Nair, A. M. Jimenez, and S. Sun, “Complexation behavior of polyelectrolytes and polyampholytes”, *Journal of Physical Chemistry Part B*, 121 (33), pp 7987–7998, 2017. | URL: <http://doi.org/10.1021/acs.jpcc.7b04582> and <http://hdl.handle.net/10754/625276>
- 15 M. F. El-Amin*, J. Kou, S. Sun and A. Salama, “Adaptive time-splitting scheme for two-phase flow in heterogeneous porous media,” *Adv. Geo-energ. Res.*, Vol. 1, No. 3, p. 182-189, 2017. [doi: 10.26804/ager.2017.03.05]
- 16 M. F. El-Amin, A. Saad, A. Salama and S. Sun, “Modeling and analysis of magnetic nanoparticles injection in water-oil two-phase flow in porous media under magnetic field effect”, *Geofluids*, Volume 2017 (2017), Article ID 3602593, 12 pages. | URL: <http://dx.doi.org/10.1155/2017/3602593>
- 17 M. F. El-Amin*, S. Amir, A. Salama, D. Urozayev, and S. Sun, “Comparative study of shale-gas production using single- and dual-continuum approaches”, *Journal of Petroleum Science and Engineering*, Volume 157, Pages 894-905, August 2017. | URL: <https://doi.org/10.1016/j.petrol.2017.07.011>
- 18 M. F. ElAmin*, A. G. Radwan and S. Sun, “Analytical solution for fractional derivative gas-flow equation in porous media”, *Results in Physics*, Volume 7, Pages 2432-2438, 2017. | URL: <https://doi.org/10.1016/j.rinp.2017.06.051>
- 19 A. M. Ibrahim, M. F. El-Amin*, and S. Sun, “Effects of nanoparticles on melting process with phase-change using the lattice Boltzmann method”, *Results in Physics*, Volume 7, Pages 1676-1682, 2017. | URL: <http://dx.doi.org/10.1016/j.rinp.2017.04.032>
- 20 Y. Li, J. Kou, and S. Sun*, “Numerical modeling of isothermal compositional grading by convex splitting methods”, *Journal of Natural Gas Science & Engineering*, Volume 43, Pages 207-221, July 2017. | URL: <http://doi.org/10.1016/j.jngse.2017.03.019>
- 21 A. Kadoura, A. K. N. Nair*, and S. Sun, “Molecular simulation study of montmorillonite in contact with variably wet supercritical carbon dioxide”, *The Journal of Physical Chemistry C*, 121 (11), pp. 6199–6208, 2017. | URL: <http://doi.org/10.1021/acs.jpcc.7b01027> and <http://hdl.handle.net/10754/623868>
- 22 S. Z. A. Amir* and S. Sun, “An efficient two-scale hybrid embedded fracture model for shale gas simulation”, *Journal of Petroleum Science and Engineering*, Volume 152, April 2017, Pages 683–714. | URL: <http://dx.doi.org/10.1016/j.petrol.2016.12.023> and <http://hdl.handle.net/10754/622079>
- 23 Y. Wang, B. Yu*, and S. Sun, “POD-Galerkin model for incompressible single-phase flow in porous media”, *Open Phys.*, 14:588–601, 2016. | URL: <http://doi.org/10.1515/phys-2016-0061> and <http://hdl.handle.net/10754/623718>
- 24 H. Yang, S. Sun, and C. Yang*, “Nonlinearly preconditioned semismooth Newton methods for variational inequality solution of two-phase flow in porous media,” *Journal of Computational Physics*, Volume 332, Pages 1-20, 1 March 2017. | URL: <http://dx.doi.org/10.1016/j.jcp.2016.11.036> and <http://hdl.handle.net/10754/621999>

- 25 H. Chen and S. Sun, “A residual-based a posteriori error estimator for single-phase Darcy flow in fractured porous media”, *Numerische Mathematik*, 136(3), 805-839, 2017. | URL: <http://doi.org/10.1007/s00211-016-0851-9>
- 26 Q. Peng, Z. Qiao, and S. Sun, “Stability and convergence analysis of second-order schemes for a diffuse interface model with Peng-Robinson equation of state,” *Journal of Computational Mathematics*, Vol.35, No.6, 737–765, 2017. | URL: <http://dx.doi.org/10.4208/jcm.1611-m2016-0623>
- 27 R. Allen and S. Sun, “Computing and comparing effective properties for flow and transport in computer-generated porous media”, *Geofluids*, Volume 2017, Article ID 4517259, 24 pages, 2017. | URL: <https://doi.org/10.1155/2017/4517259>
- 28 J. Kou and S. Sun, “Efficient energy-stable dynamic modeling of compositional grading,” *International Journal of Numerical Analysis and Modeling*, Volume 14, Number 2, Pages 218–242, 2016. | URL: <http://www.math.ualberta.ca/ijnam/Volume-14-2017/No-2-17/2017-02-04.pdf>
- 29 X. Fan, J. Kou, Z. Qiao, and S. Sun, “A component-wise convex splitting scheme for diffuse interface models with Van der Waals and Peng-Robinson Equations of State”, *SIAM Journal on Scientific Computing*, 39(1), B1–B28 (28 pages), 2017. | URL: <http://hdl.handle.net/10754/623029> and <http://doi.org/10.1137/16M1061552>
- 30 M. F. El-Amin, J. Kou, and S. Sun, “Convergence analysis of the nonlinear iterative method for two-phase flow in porous media associated with nanoparticle injection”, *International Journal of Numerical Methods for Heat and Fluid Flow*, Vol. 27, Issue: 10, pp. 2289-2317, 2017. | URL: <https://doi.org/10.1108/HFF-05-2016-0210>
- 31 M. Ferdows*, T.S. Khalequ, E.E. Tzirtzilakis, and S. Sun, “Effects of radiation and thermal conductivity on MHD boundary layer flow with heat transfer along a vertical stretching sheet in a porous medium”, *Journal of Engineering Thermophysics*, Volume 26, Issue 1, pp. 96–106, January 2017. | URL: <https://doi.org/10.1134/S1810232817010118>
- 32 T. Zhang, J. Kou, and S. Sun, “Review on dynamic Van der Waals theory in two-phase flow”, *Adv. Geoennerg. Res.*, Vol. 1, No. 2, p. 124-134, 2017. [doi: 10.26804/ager.2017.02.08]
- 33 H. Chen, A. Salama, and S. Sun, “Adaptive mixed finite element methods for Darcy flow in fractured porous media”, *Water Resources Research*, 52,7851–7868, 2016. | URL: <http://dx.doi.org/10.1002/2015WR018450>
- 34 K. Katterbauer, S. Arango, S. Sun, and I. Hoteit, “Integrating gravimetric and interferometric synthetic aperture radar data for enhancing reservoir history matching of carbonate gas and volatile oil reservoirs”, *Geophysical Prospecting*, 25 August 2016. | URL: <http://dx.doi.org/10.1111/1365-2478.12371>
- 35 A. Kadoura, A. K. N. Nair, S. Sun, “Molecular Dynamics Simulations of Carbon Dioxide, Methane, and Their Mixture in Montmorillonite Clay Hydrates,” *The Journal of Physical Chemistry C*, 120 (23), pp 12517–12529, 2016. | URL: <http://dx.doi.org/10.1021/acs.jpcc.6b02748>
- 36 H. Yang, C. Yang, and S. Sun, “Active-set reduced-space methods with nonlinear elimination for two-phase flow problems in porous media”, *SIAM Journal on Scientific Computing*, 38(4), B593–B618. (26 pages), 2016. | URL: <http://dx.doi.org/10.1137/15M1041882>
- 37 A. Kadoura, A. Siripatana, S. Sun, O. Knio, and I. Hoteit, “Single-site Lennard-Jones models via polynomial chaos surrogates of Monte Carlo molecular simulation”, *Journal of Chemical Physics*, 144, 214301 (9 pages), 2016. | URL: <http://dx.doi.org/10.1063/1.4952976>
- 38 J. Kou and S. Sun, “Multi-scale diffuse interface modeling of multi-component two-phase flow with partial miscibility”, *Journal of Computational Physics*, Volume 318, Pages 349–372, 1 August 2016. | URL: <http://dx.doi.org/10.1016/j.jcp.2016.04.055>
- 39 H. Zhong, X.-P. Wang, and S. Sun, “A numerical study of three-dimensional droplets spreading on chemically patterned surfaces”, *Discrete and Continuous Dynamical Systems Series B*, Volume 21, Number 8, pp. 2905–2926, October 2016. | URL: <https://doi.org/10.3934/dcdsb.2016079> and <http://hdl.handle.net/1783.1/81329>
- 40 Y. Wang and S. Sun, “Direct calculation of permeability by high-accurate finite difference and numerical integration methods”, *Communications in Computational Physics*, 20(2), pp. 405-440, August 2016. | URL: <http://dx.doi.org/10.4208/cicp.210815.240316a>
- 41 J. Hou, J. Chen*, S. Sun, Z. Chen, “Adaptive mixed-hybrid and penalty discontinuous Galerkin method for two-phase flow in heterogeneous media,” *Journal of Computational and Applied Mathematics*, Volume 307, Pages 262-283, 1 December 2016. | URL: <http://dx.doi.org/10.1016/j.cam.2016.01.050>

- 42 Y. Wu and S. Sun, "Equivalence of two models in single-phase multicomponent flow simulations," *Computers and Mathematics with Applications*, 71(6), Pages 1303–1316, March 2016. | URL: <http://dx.doi.org/10.1016/j.camwa.2016.02.008>
- 43 A. Kadoura, A. K. Narayanan Nair, and S. Sun, "Adsorption of carbon dioxide, methane, and their mixture by montmorillonite in the presence of water," *Microporous and Mesoporous Materials*, Volume 225, Pages 331–341, 1 May 2016. | URL: <http://dx.doi.org/10.1016/j.micromeso.2016.01.010>
- 44 J. Kou, S. Sun and X. Wang, "An energy stable evolutionary method for simulating two-phase equilibria of multi-component fluids at constant moles, volume and temperature", *Computational Geosciences*, Volume 20, Issue 1, pp. 283-295, February 2016. | URL: <http://dx.doi.org/10.1007/s10596-016-9564-5>
- 45 J. Kou, S. Sun and Y. Wu, "Mixed finite element-based fully conservative methods for simulating wormhole propagation," *Comput. Methods Appl. Mech. Engrg.*, 298, 279–302, 2016. | URL: <http://dx.doi.org/10.1016/j.cma.2015.09.015>
- 46 A. Kadoura, A. Salama and S. Sun, "Speeding up Monte Carlo molecular simulation by a non-conservative early rejection scheme", *Molecular Simulation*, Volume 42, Issue 3, 229–241, 2016. | URL: <http://dx.doi.org/10.1080/08927022.2015.1025268>
- 47 S. Du, S. Sun, and X. Xie, "Residual-based a posteriori error estimation for multipoint flux mixed finite element methods", *Numerische Mathematik*, Volume 134, Issue 1, pp 197–222, September 2016 (2013/12/23 to Xiv preprint arXiv:1312.6460). | URL: <http://dx.doi.org/10.1007/s00211-015-0770-1>
- 48 K. Katterbauer, S. Arango, S. Sun, I. Hoteit, "Enhanced characterization of reservoir hydrocarbon components using electromagnetic data attributes," *Journal of Petroleum Science and Engineering*, Volume 140, Pages 1–15, April 2016. | URL: <http://dx.doi.org/10.1016/j.petrol.2015.12.015>
- 49 K. Bao, A. Salama, and S. Sun, "Numerical investigation on the effects of a precursor wetting film on the displacement of two immiscible phases along a channel", *Flow, Turbulence and Combustion*, Volume 96, Issue 3, pp 757–771, April 2016. | URL: <http://hdl.handle.net/10754/579912> and <http://dx.doi.org/10.1007/s10494-015-9655-8>
- 50 A. Salama, S. Sun, and K. Bao, "An experimenting field approach for the numerical solution of multiphase flow in porous media", *Groundwater*, Vol. 54, No. 2, pages 262–273, March-April 2016. | URL: <http://dx.doi.org/10.1111/gwat.12353> and <http://hdl.handle.net/10754/579849>
- 51 A. Salama, M. F. ElAmin, S. Sun, "Numerical investigation of high level nuclear waste disposal in deep anisotropic geologic repositories", *Progress in Nuclear Energy*, Volume 85, Pages 747–755, November 2015. | URL: <http://dx.doi.org/10.1016/j.pnucene.2015.09.004>
- 52 K. Bao, M. Yan, L. Lu, R. Allen, A. Salama, K.E. Jordan, and S. Sun, "High-performance modeling of CO₂ sequestration by coupling reservoir simulation and molecular dynamics," *SPE Journal*, Volume 21, Issue 3, Pages 853 - 863, June 2016. | URL: <http://dx.doi.org/10.2118/163621-PA>
- 53 K. Katterbauer, S. Arango, S. Sun, I. Hoteit, "Synergizing crosswell seismic and electromagnetic techniques for enhancing reservoir characterization," *SPE Journal*, Volume 21, Issue 3, Pages 909 – 927, June 2016. | URL: <http://dx.doi.org/10.2118/174559-PA>
- 54 K. Katterbauer, S. Arango, S. Sun, and I. Hoteit, "Enhanced heavy oil recovery for carbonate reservoirs integrating cross-well seismic – A synthetic Wafra case study", *Journal of Petroleum Science and Engineering*, Volume 134, Pages 1–13, October 2015. | URL: <http://dx.doi.org/10.1016/j.petrol.2015.07.010>
- 55 Y. Wu, A. Salama and S. Sun, "Parallel simulation of wormhole propagation with the Darcy-Brinkman-Forchheimer framework", *Computers and Geotechnics*, Volume 69, Pages 564–577, September 2015. | URL: <http://dx.doi.org/10.1016/j.compgeo.2015.06.021> and <http://hdl.handle.net/10754/566010>
- 56 A. Salama, A. Negara, M. F. ElAmin, and S. Sun, "Numerical investigation of nanoparticles transport in anisotropic porous media", *Journal of Contaminant Hydrology*, Volume 181, Pages 114–130, October 2015. | URL: <http://dx.doi.org/10.1016/j.jconhyd.2015.06.010>
- 57 J. Kou and S. Sun, "Numerical methods for a multi-component two-phase interface model with geometric mean influence parameters", *SIAM Journal on Scientific Computing*, 37(4), pp. B543-B569, 2015. | URL: <http://dx.doi.org/10.1137/140969579>
- 58 T. Zhang, A. Salama, S. Sun, and M. F. El-Amin, "Pore network modeling of drainage process in patterned porous media: a quasi-static study", *Journal of Computational Science*, Volume 9, Pages 64–69, July 2015. | URL: <http://dx.doi.org/10.1016/j.jocs.2015.04.010>
- 59 J. Kou and S. Sun, "Unconditionally stable methods for simulating multi-component two-phase interface models with Peng-Robinson equation of state and various boundary conditions," *Journal of*

- Computational and Applied Mathematics*, Volume 291, Pages 158–182, January 2016. | URL: <http://dx.doi.org/10.1016/j.cam.2015.02.037>
- 60 A. Negara, A. Salama, and S. Sun, “Multiphase flow simulation with gravity effect in anisotropic porous media using multipoint flux approximation,” *Computers and Fluids*, Volume 114, Pages 66–74, July 2015. | URL: <http://dx.doi.org/10.1016/j.compfluid.2015.02.012> and <http://hdl.handle.net/10754/579884>
- 61 Y. Wu, C. Kowitz, S. Sun, and A. Salama, “Speeding up the flash calculations in two-phase compositional flow simulations – The application of sparse grids”, *Journal of Computational Physics*, Volume 285, Pages 88–99, 15 March 2015. | URL: <http://dx.doi.org/10.1016/j.jcp.2015.01.012>
- 62 D. Mukherjee, Z. Zaky, T. I. Zohdi, A. Salama, and S. Sun, “Investigation of guided particle transport for noninvasive healing of damaged piping systems using electro-magneto-mechanical methods”, *SPE J.*, 20(4): 872 – 883, August 2015. [SPE-169639-PA] | URL: <http://dx.doi.org/10.2118/169639-PA>
- 63 J. Li and S. Sun, “The superconvergence phenomenon and proof of the MAC scheme for the Stokes equations on non-uniform rectangular meshes,” *Journal of Scientific Computing*, Volume 65, Issue 1, pp 341–362, October 2015. | URL: <http://dx.doi.org/10.1007/s10915-014-9963-5>
- 64 K. Katterbauer, I. Hoteit, and S. Sun, “History matching of electromagnetically heated reservoirs incorporating full-wavefield seismic and electromagnetic imaging,” *SPE J.*, 20(5): 923 - 941, October 2015 [SPE-173896-PA]. | URL: <http://dx.doi.org/10.2118/173896-PA>
- 65 M.F. El-Amin, A. Al-Ghamdi, A. Salama, and S. Sun, “Numerical simulation and analysis of confined turbulent buoyant jet with variable source,” *J. Hydrodynamics, Ser. B*, Volume 27, Issue 6, Pages 955–968, December 2015. | URL: [http://dx.doi.org/10.1016/S1001-6058\(15\)60558-3](http://dx.doi.org/10.1016/S1001-6058(15)60558-3)
- 66 M. El-Amin, A. Salama and S. Sun, “Numerical and dimensional analysis of nanoparticles transport with two-phase flow in porous media,” *J. Petrol. Science and Engineering*, Volume 128, Pages 53–64, April 2015. | URL: <http://dx.doi.org/10.1016/j.petrol.2015.02.025>
- 67 Mohammed Louaked, Nour Seloula, Shuyu Sun, and Saber Trabelsi, “A pseudocompressibility method for the incompressible Brinkman-Forchheimer equations,” *Differential and Integral Equations*, Volume 28, Numbers 3-4, pp. 361-382, March/April 2015. | URL: <http://projecteuclid.org/euclid.die/1423055233>
- 68 J. Kou, S. Sun, and X. Wang, “Efficient numerical methods for simulating surface tension of multi-component mixtures with the gradient theory of fluid interfaces,” *Computer Methods in Applied Mechanics and Engineering*, Volume 292, Pages 92–106, August 2015. | URL: <http://dx.doi.org/10.1016/j.cma.2014.10.023> and <http://hdl.handle.net/10754/564196>
- 69 A. Salama, S. Sun and M. ElAmin, “Investigation of thermal energy transport from an anisotropic central heating element to the adjacent channels: A Multipoint flux approximation,” *Annals of Nuclear Energy*, 76, pp. 100-112, 2015. | URL: <http://dx.doi.org/10.1016/j.anucene.2014.09.049>
- 70 A. Salama, M. F. ElAmin, and S. Sun, “Three-dimensional, numerical investigation of flow and heat transfer in rectangular channels subject to partial blockage”, *Heat Transfer Engineering*, 36(2): 152–165, 2015. | URL: <http://dx.doi.org/10.1080/01457632.2014.909191>
- 71 K. Katterbauer, S. Arango, S. Sun, and I. Hoteit, “Multi-data reservoir history matching for enhanced reservoir forecasting and uncertainty quantification,” *Journal of Petroleum Science and Engineering*, Volume 128, Pages 160–176, April 2015. | URL: <http://dx.doi.org/10.1016/j.petrol.2015.02.016>
- 72 K. Katterbauer, I. Hoteit, and S. Sun, “EMSE: Synergizing EM and seismic data attributes for enhanced forecasts of reservoirs”, *Journal of Petroleum Science and Engineering*, Volume 122, Pages 396–410, October 2014. | URL: <http://dx.doi.org/10.1016/j.petrol.2014.07.039>
- 73 A. K. Narayanan Nair, S. Uyaver, and S. Sun, “Conformational transitions of a weak polyampholyte”, *Journal of Chemical Physics*, 141, 134905, 2014. | URL: <http://dx.doi.org/10.1063/1.4897161>
- 74 M.F. El-Amin, S. Sun, and A. Salama, “Simulation of buoyancy-induced turbulent flow from a hot horizontal jet,” *Journal of Hydrodynamics*, 26, 1, 2014, pp. 104-113, 2014. | URL: [http://dx.doi.org/10.1016/S1001-6058\(14\)60012-3](http://dx.doi.org/10.1016/S1001-6058(14)60012-3)
- 75 H. Zhong, X.-P. Wang, A. Salama, and S. Sun, “Quasistatic analysis on configuration of two-phase flow in Y-shaped tubes”, *Computers and Mathematics with Applications*, 68, 12, Part A, 1905-1914, 2014. | URL: <http://dx.doi.org/doi:10.1016/j.camwa.2014.10.004>
- 76 S. Chang, S. Sun, and H. Yang, “Optimal convergence of discontinuous Galerkin methods for continuum modeling of supply chain networks”, *Computers and Mathematics with Applications*, Volume 68, Issue 6, Pages 681–691, September 2014. | URL: <http://dx.doi.org/10.1016/j.camwa.2014.07.012>

- 77 Z. Qiao and S. Sun, "Two-phase fluid simulation using a diffuse interface model with Peng-Robinson equation of state", *SIAM Journal on Scientific Computing (SIAM J. Sci. Comput.)*, 36(4), B708–B728 (21 pages), 2014. | URL: <http://dx.doi.org/10.1137/130933745>
- 78 J. Chen, S. Sun, and Z. Chen, "Coupling two-phase fluid flow with two-phase Darcy flow in anisotropic porous media," *Advances in Mechanical Engineering*, Volume 2014, Article ID 871021, 13 pages, 2014. | URL: <http://dx.doi.org/10.1155/2014/871021>
- 79 A. Kadoura, S. Sun, and A. Salama, "Extrapolation of canonical ensemble averages and second derivatives to different temperature and density conditions by reweighting and reconstructing Monte Carlo Markov chains," *J. Computational Physics*, Volume 270, Pages 70–85, 1 August 2014. | URL: <http://dx.doi.org/10.1016/j.jcp.2014.03.038>
- 80 M. E. Gharamti, A. Kadoura, J. Valstar, S. Sun, and I. Hoteit, "Constraining a compositional flow model with flow-chemical data using an ensemble-based Kalman filter", *Water Resources Research*, Volume 50, Issue 3, pages 2444–2467, March 2014. | URL: <http://dx.doi.org/10.1002/2013WR014830>
- 81 J. Chen, S. Sun, and X.-P. Wang, "A numerical method for a model of two-phase flow in a coupled free flow and porous media system," *Journal of Computational Physics*, Volume 268, Pages 1–16, 1 July 2014. | URL: <http://dx.doi.org/10.1016/j.jcp.2014.02.043>
- 82 J. Li, P. Vignal, S. Sun, and V. M. Calo, "On stochastic error and computational efficiency of the Markov chain Monte Carlo method," *Communications in Computational Physics*, 16(2), pp. 467–490, August 2014. | URL: <http://dx.doi.org/10.4208/cicp.110613.280214a> or <http://www.global-sci.com>
- 83 A. Kadoura, A. Salama, and S. Sun, "A conservative and a hybrid early rejection schemes for accelerating Monte Carlo molecular simulation," *Molecular Physics*, 112, 19, pp. 2575–2586, 2014. | URL: <http://dx.doi.org/10.1080/00268976.2014.897392>
- 84 A. Salama, M. ElAmin, and S. Sun, "Numerical investigation of natural convection in two enclosures separated by an anisotropic solid wall," *Int. J. Num. Meth. Heat & Fluid Flow*, 24(8), pp. 1928–1953, 2014. | URL: <http://dx.doi.org/10.1108/HFF-09-2013-0268>
- 85 A. Salama, S. Sun, and M. Wheeler, "Solving global problem by considering multitude of local problems: Application to fluid flow in anisotropic porous media using the multipoint flux approximation," *Journal of Computational and Applied Mathematics*, Volume 267, Pages 117–130, September 2014. | URL: <http://dx.doi.org/10.1016/j.cam.2014.01.016>
- 86 J. Hou, S. Sun and Z. Chen, "Numerical comparison of robustness of some reduction methods in rough grids," *Numerical Methods for Partial Differential Equations*, Volume 30, Issue 5, pages 1484–1506, September 2014. | URL: <http://dx.doi.org/10.1002/num.21873>
- 87 J. Kou and S. Sun, "Upwind discontinuous Galerkin Methods with mass conservation of both phases for incompressible two-phase flow in porous media", *Numerical Methods for Partial Differential Equations*, Volume 30, Issue 5, pages 1674–1699, September 2014. | URL: <http://dx.doi.org/10.1002/num.21817>
- 88 H. Dong, Z. Qiao, S. Sun, and T. Tang, "Adaptive moving grid methods for two-phase flow in porous media", *Journal of Computational and Applied Mathematics*, Volume 265, Pages 139–150, August 2014. | URL: <http://dx.doi.org/10.1016/j.cam.2013.09.027>
- 89 J. Kou and S. Sun, "Analysis of a combined mixed finite element and discontinuous Galerkin method for incompressible two-phase flow in porous media," *Mathematical Methods in the Applied Sciences*, in press, Volume 37, Issue 7, pages 962–982, May 2014. | URL: <http://dx.doi.org/10.1002/mma.2854>
- 90 J. Kou and S. Sun, "An adaptive finite element method for simulating surface tension with the gradient theory of fluid interfaces," *Journal of Computational and Applied Mathematics*, 255: 593–604, 2014. | URL: <http://dx.doi.org/10.1016/j.cam.2013.06.017>
- 91 J. Kou and S. Sun, "Convergence of discontinuous Galerkin methods for incompressible two-phase flow in heterogeneous media", *SIAM Journal on Numerical Analysis*, Vol. 51, No. 6, pp. 3280–3306, 2013. | URL: <http://dx.doi.org/10.1137/120898358>
- 92 M. F. ElAmin, A. Salama, and S. Sun, "A generalized power-law scaling law for a two-phase imbibition in a porous medium", *J. Petrol. Science and Engineering*, 111: 159–169, 2013. | URL: <http://dx.doi.org/10.1016/j.petrol.2013.08.033>
- 93 A. Salama, W. Li, and S. Sun, "Finite volume approximation of the three-dimensional flow equation in axisymmetric, heterogeneous porous media based on local analytical solution", *J. Hydrology*, 501: 45–55, September 2013. | URL: <http://dx.doi.org/10.1016/j.jhydrol.2013.07.036>
- 94 A. Salama, S. Sun, and M. F. El-Amin, "An efficient implicit-pressure/explicit-saturation-method-based shifting matrix algorithm to simulate two-phase, immiscible flow in porous media with application to

- CO₂ sequestration in the subsurface", *SPE J.*, 18(6): 1092-1100, 2013 [SPE-163140-PA]. | URL: <http://dx.doi.org/10.2118/163140-PA>
- 95 A. Salama, S. Sun, and M. F. El-Amin, "A multi-point flux approximation of the steady state heat conduction equation in anisotropic media", *ASME, J. Heat Transfer*, 135(4): 041302 (6 pages), 2013. | URL: <http://dx.doi.org/10.1115/1.4023228>
- 96 J. Cai and S. Sun, "Fractal analysis of fracture increasing spontaneous imbibition in porous media saturated with gas," *International Journal of Modern Physics C (Int. J. Mod. Phys. C)*, 24(8): 1350056 (13 pages), 2013. | URL: <http://dx.doi.org/10.1142/S0129183113500563>
- 97 M. F. El-Amin, A. Salama and S. Sun, "Numerical and dimensional investigation of two-phase countercurrent imbibition in porous media", *Journal of Computational and Applied Mathematics*, Volume 242, Pages 285–296, April 2013. | URL: <http://dx.doi.org/10.1016/j.cam.2012.09.035>
- 98 Y. Wang, S. Sun and B. Yu, "On full-tensor permeabilities of porous media from numerical solutions of the Navier-Stokes equation", *Advances in Mechanical Engineering*, Volume 2013, Article ID 137086, 11 pages, 2013. | URL: <http://dx.doi.org/10.1155/2013/137086>
- 99 A. Salama, I. A. Abbas, M. F. El-Amin, S. Sun, "Comparison study between the effects of different terms contributing to viscous dissipation in saturated porous media", *International Journal of Thermal Sciences*, 64: 195–203, February 2013. | URL: <http://dx.doi.org/10.1016/j.ijthermalsci.2012.08.021>
- 100 W. Li, B. Yu, X. Wang, P. Wang, and S. Sun, "A finite volume method for cylindrical heat conduction problems based on local analytical solution", *International Journal of Heat and Mass Transfer*, Volume 55, Issues 21–22, Pages 5570–5582, October 2012. | URL: <http://dx.doi.org/10.1016/j.ijheatmasstransfer.2012.05.043>
- 101 G. Yu, B. Yu, S. Sun, and W.-Q. Tao, "Comparative study on triangular and quadrilateral meshes by a finite-volume method with a central difference scheme", *Numerical Heat Transfer, Part B*, Volume 62, Issue 4, pages 243-263, 2012. | URL: <http://dx.doi.org/10.1080/10407790.2012.709416>
- 102 S. Sun, A. Firoozabadi, and J. Kou, "Numerical modeling of two-phase binary fluid mixing using mixed finite elements", *Computational Geosciences*, Volume 16, Issue 4, pp 1101-1124, September 2012. | URL: <http://dx.doi.org/10.1007/s10596-012-9306-2>
- 103 M. Ferdows, Md. S. Khan, Md. M. Alam, and S. Sun, "MHD mixed convective boundary layer flow of a nanofluid through a porous medium due to an exponentially stretching sheet," *Mathematical Problems in Engineering*, vol. 2012, Article ID 408528, 21 pages, 2012. | URL: <http://dx.doi.org/10.1155/2012/408528>
- 104 S. Sun, A. Salama, and M.F. El-Amin, "Matrix-oriented implementation for the numerical solution of the partial differential equations governing flows and transport in porous media", *Computers and Fluids*, 68:38–46, 2012. | URL: <http://dx.doi.org/10.1016/j.compfluid.2012.07.027>
- 105 W. Li, B. Yu, S. Sun, and X. Wang, "Calculation of cell face velocity of non-staggered grid system", *Applied Mathematics and Mechanics*, Volume 33, Issue 8, pp 991-1000, August 2012. | URL: <http://dx.doi.org/10.1007/s10483-012-1600-6>
- 106 K. Bao, Y. Shi, S. Sun, X.-P. Wang, "A finite element method for the numerical solution of the coupled Cahn-Hilliard and Navier-Stokes system for moving contact line problems", *Journal of Computational Physics*, 231(24): 8083–8099, 15 October 2012. | URL: <http://dx.doi.org/10.1016/j.jcp.2012.07.027>
- 107 P. Song and S. Sun, "Contaminant flow and transport simulation in cracked porous media using locally conservative schemes", *Advances in Applied Mathematics and Mechanics (AAMM)*, 4(4): 389-421, 2012. | URL: <http://www.global-sci.org/aamm/volumes/v4n4/index.html>
- 108 M. F. El-Amin, A. Salama and S. Sun, "Effects of gravity and inlet location on a two-phase countercurrent imbibition in porous media," Special issue on Advances in Computational Fluid Dynamics, *International Journal of Chemical Engineering*, Article ID 210128, 7 pages, 2012. | URL: <http://dx.doi.org/10.1155/2012/210128>
- 109 Y. Wang, B. Yu, and S. Sun, "Fast prediction method for steady-state heat convection," *Chemical Engineering & Technology*, 35(4): 668–678, 2012. | URL: <http://dx.doi.org/10.1002/ceat.201100428>
- 110 K. Bao, A. Salama, and S. Sun, "Upscaling of permeability field of fractured rock system: numerical examples," *Journal of Applied Mathematics*, Volume 2012 (2012), Article ID 546203, 20 pages, 2012. | URL: <http://dx.doi.org/10.1155/2012/546203>
- 111 M.F. El-Amin and S. Sun, "Horizontal H₂-air turbulent buoyant jet resulting from hydrogen leakage," *International Journal of Hydrogen Energy*, 37(4): 3949-3957, 2012. | URL: <http://dx.doi.org/10.1016/j.ijhydene.2011.04.007>

- 112 M. ElGharamti, I. Hoteit, and S. Sun, “Low-rank Kalman filtering for efficient state estimation of subsurface advective contaminant transport models”, *Journal of Environmental Engineering*, 138(4), 446–457, 2012. | URL: [http://dx.doi.org/10.1061/\(ASCE\)EE.1943-7870.0000484](http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000484)
- 113 M. F. El-Amin, A. Salama, S. Sun, R. S. R. Gorla, “Development of flow and heat transfer in the vicinity of a vertical plate embedded in porous medium with viscous dissipation effect,” *Special Topics & Reviews in Porous Media*, 3(2): 169-175, 2012. | URL: <http://dx.doi.org/10.1615/SpecialTopicsRevPorousMedia.v3.i2.80>
- 114 M. F. El-Amin, S. Sun and A. Salama, “Theoretical analysis and semi-analytical solutions for a turbulent buoyant hydrogen-air jet,” *Journal of Applied Mathematics*, special issue on “Mathematical and Numerical Modeling of Flow and Transport 2012”, Volume 2012 (2012), Article ID 710172, 12 pages, 2012. | URL: <http://dx.doi.org/10.1155/2012/710172>
- 115 Y. Huang, J. Li, W. Yang and S. Sun, “Superconvergence of mixed finite element approximations to 3-D Maxwell's equations in metamaterials,” *Journal of Computational Physics*, 230(22): 8275–8289, 2011. | URL: <http://dx.doi.org/10.1016/j.jcp.2011.07.025>
- 116 V. J. Ervin, E. W. Jenkins, and S. Sun, “Coupling nonlinear Stokes and Darcy flow using mortar finite elements”, *Applied Numerical Mathematics*, 61: 1198–1222, 2011. | URL: <http://dx.doi.org/10.1016/j.apnum.2011.08.002>
- 117 A. Negara, M. F. El-Amin and S. Sun, “Simulation of CO₂ Plume in porous media: consideration of capillarity and buoyancy effects”, *International Journal of Numerical Analysis and Modeling Series B (IJNAMB)*, 2(4): 315–337, 2011. | URL: <http://www.math.ualberta.ca/ijnamb/Volume-2-2011/No-4-11/2011-04-03.pdf>
- 118 J. Moortgat, S. Sun and A. Firoozabadi, “Compositional modeling of three-phase flow with gravity using higher-order finite element methods”, *Water Resources Research*, 47, W05511, 2011. | URL: <http://dx.doi.org/10.1029/2010WR009801>
- 119 M. F. El-Amin and S. Sun, “Combined effect of magnetic field and thermal dispersion on a non-Darcy mixed convection,” *Journal of Thermal Science*, 20(3): 276-282, 2011. | URL: <http://dx.doi.org/10.1007/s11630-011-0470-9>
- 120 A. Salama, M. F. El-Amin, I. Abbas, and S. Sun, “On the viscous dissipation modeling of thermal fluid flow in a porous medium,” *Archive of Applied Mechanics*, 81(12): 1865-1876, 2011. | URL: <http://dx.doi.org/10.1007/s00419-011-0523-2>
- 121 C. Dong, S. Sun and G. A. Taylor, “Numerical modeling of contaminant transport in fractured porous media using mixed finite element and finite volume methods,” *Journal of Porous Media*, 14(3): 219-242, 2011. | URL: <http://dx.doi.org/10.1615/JPorMedia.v14.i3.30>
- 122 J. Kou, S. Sun, and B. Yu, “Multiscale time splitting strategy for multi-scale multi-physics processes of two-phase flow in fractured media”, *Journal of Applied Mathematics*, special issue on “Mathematical and Numerical Modeling of Flow and Transport,” Volume 2011 (2011), Article ID 861905, 24 pages, 2011. | URL: <http://dx.doi.org/10.1155/2011/861905>
- 123 M. F. El-Amin and S. Sun, “Effects of gravity and inlet/outlet location on a two-phase co-current imbibition in porous media,” *Journal of Applied Mathematics*, special issue on “Mathematical and Numerical Modeling of Flow and Transport”, Volume 2011 (2011), Article ID 673523, 18 pages, 2011. | URL: <http://dx.doi.org/10.1155/2011/673523>
- 124 M. F. El-Amin, N. A. Ebrahim, A. Salama, and S. Sun, “Radiative mixed convection over an isothermal cone embedded in a porous medium with variable permeability,” *Journal of Applied Mathematics*, special issue on “Mathematical and Numerical Modeling of Flow and Transport”, Volume 2011 (2011), Article ID 124590, 10 pages, 2011. | URL: <http://dx.doi.org/10.1155/2011/124590>
- 125 X. Fan, S. Sun, W. Wei, and J. Kou, “Numerical simulation of pollutant transport in fractured vuggy porous Karstic aquifers,” *Journal of Applied Mathematics*, special issue on “Mathematical and Numerical Modeling of Flow and Transport”, Volume 2011 (2011), Article ID 498098, 41 pages, 2011. | URL: <http://dx.doi.org/10.1155/2011/498098>
- 126 M. F. El-Amin, S. Sun, M. A. El-Ameen, Y. A. Jaha and R. S. R. Gorla, “Non-Darcy free convection of power-law fluids over a two-dimensional body embedded in a porous medium”, *Transport in Porous Media*, 86(3): 965-972, 2011. | URL: <http://dx.doi.org/10.1007/s11242-010-9667-8>
- 127 M. F. El-Amin, S. Sun and H. Kanayama, “Non-Boussinesq turbulent buoyant jet of a low-density gas leaks into high-density ambient,” *Applied Mathematics and Computation*, 217: 3764–3778, 2010. | URL: <http://dx.doi.org/10.1016/j.amc.2010.09.035>

- 128 J. Kou and S. Sun, "On iterative IMPES formulation for two phase flow with capillarity in heterogeneous porous media," *International Journal of Numerical Analysis and Modeling Series B (IJNAMB)*, 1(1), 20–40, 2010. | URL: <http://www.math.ualberta.ca/ijnamb/Volume-1-2010/No-1-10/2010-01-02.pdf>
- 129 J. Kou and S. Sun, "A new treatment of capillarity to improve the stability of IMPES two-phase flow formulation", *Computers and Fluids*, 39(10), 1923–1931, 2010. | URL: <http://dx.doi.org/10.1016/j.compfluid.2010.06.022>
- 130 B. Yu, C. Li, Z. Zhang, X. Liu, J. Zhang, J. Wei, S. Sun, and J. Huang, "Numerical simulation of a buried hot crude oil pipeline under normal operation", *Applied Thermal Engineering*, 30, 2670–2679, 2010. | URL: <http://dx.doi.org/10.1016/j.applthermaleng.2010.07.016>
- 131 M. F. El-Amin, S. Sun, W. Heidemann and H. Müller-Steinhagen, "Analysis of a turbulent buoyant confined jet modeled using realizable $k-\epsilon$ model", *Heat and Mass Transfer*, 46(8-9), 943–960, 2010. | URL: <http://dx.doi.org/10.1007/s00231-010-0625-3>
- 132 J. Kou, X. Wang, and S. Sun, "Some new root-finding methods with eighth-order convergence", *Bull. Math. Soc. Sci. Math. Roumanie*, 53(101), No. 2, 133–143, 2010. | URL: www.rms.unibuc.ro/bulletin/pdf/53-2/Kou.pdf
- 133 C. Xu, B. Yu, Z. Zhang, J. Zhang, J. Wei and S. Sun, "Numerical simulation of a buried hot crude oil pipeline during shutdown", *Pet. Sci.*, 7: 73-82, 2010. | URL: <http://dx.doi.org/10.1007/s12182-010-0008-x>
- 134 H. Wei, M. Dong, and S. Sun, "Inoperability Input-Output Modeling (IIM) of disruptions to supply chain networks", *Systems Engineering*, 13(4): 324-339, 2010. | URL: <http://dx.doi.org/10.1002/sys.20153>
- 135 S. Sun and J. Liu, "A locally conservative finite element method based on enrichment of the continuous Galerkin method", *SIAM Journal on Scientific Computing*, 31(4), 2528–2548, 2009. | URL: <http://dx.doi.org/10.1137/080722953>
- 136 M. Dong, S. Sun, and X. Jin, "Modelling and analysis of newsvendor-based trading options in supply chains", *Int. J. Services Operations and Informatics*, 4(3), 258–271, 2009. | URL: <http://dx.doi.org/10.1504/IJSOI.2009.026952>
- 137 K. Wang, H. Wang, S. Sun, and M. F. Wheeler, "An optimal-order L^2 -error estimate for non-symmetric discontinuous Galerkin methods for a diffusion equation in multiple space dimensions", *Computer Methods in Applied Mechanics and Engineering*, 198(27-29), 2190-2197, 2009. | URL: <http://dx.doi.org/10.1016/j.cma.2009.02.006>
- 138 V. J. Ervin, E. W. Jenkins, and S. Sun, "Coupled generalized non-linear stokes flow with flow through a porous medium", *SIAM Journal on Numerical Analysis*, 47(2), 929–952, 2009. | URL: <http://dx.doi.org/10.1137/070708354>
- 139 V. Girault, S. Sun, M. F. Wheeler and I. Yotov, "Coupling discontinuous Galerkin and mixed finite element discretizations using mortar finite elements", *SIAM Journal on Numerical Analysis*, 46(2), 949–979, 2008. | URL: <http://dx.doi.org/10.1137/060671620>
- 140 S. Sun and M. Dong, "Continuum modeling of supply chain networks using discontinuous Galerkin methods", *Computer Methods in Applied Mechanics and Engineering*, 197(13-16), 1204-1218, 2008. | URL: <http://dx.doi.org/10.1016/j.cma.2007.10.012>
- 141 S. Sun and J. Geiser, "Multiscale discontinuous Galerkin and operator-splitting methods for modeling subsurface flow and transport", *International Journal for Multiscale Computational Engineering*, 6(1), 87-101, 2008. | URL: <http://dx.doi.org/10.1615/IntJMultCompEng.v6.i1.80>
- 142 S. Sun and M. F. Wheeler, "Local problem-based *a posteriori* error estimators for discontinuous Galerkin approximations of reactive transport", *Computational Geosciences*, 11(2), 87–101, 2007. | URL: <http://dx.doi.org/10.1007/s10596-007-9041-2>
- 143 S. Sun and M. F. Wheeler, "Discontinuous Galerkin methods for simulating bioreactive transport of viruses in porous media", *Advances in Water Resources*, 30(6-7), 1696-1710, 2007. | URL: <http://dx.doi.org/10.1016/j.advwatres.2006.05.033>
- 144 S. Sun and M. F. Wheeler, "Anisotropic and dynamic mesh adaptation for discontinuous Galerkin methods applied to reactive transport", *Computer Methods in Applied Mechanics and Engineering*, 195(25-28), 3382-3405, 2006. | URL: <http://dx.doi.org/10.1016/j.cma.2005.06.019>
- 145 S. Sun and M. F. Wheeler, "A dynamic, adaptive, locally conservative and nonconforming solution strategy for transport phenomena in chemical engineering", *Chemical Engineering Communications*, 193(12), 1527-1545, 2006. | URL: <http://dx.doi.org/10.1080/00986440600584284>

- 146 S. Sun and M. F. Wheeler, "Analysis of discontinuous Galerkin methods for multicomponent reactive transport problems", *Computers and Mathematics with Applications*, 52(5), 637-650, 2006. | URL: <http://dx.doi.org/10.1016/j.camwa.2006.10.004>
- 147 S. Sun and M. F. Wheeler, "Projections of velocity data for the compatibility with transport", *Computer Methods in Applied Mechanics and Engineering*, 195, 653-673, 2006. | URL: <http://dx.doi.org/10.1016/j.cma.2005.02.011>
- 148 S. Sun and M. F. Wheeler, "A posteriori error estimation and dynamic adaptivity for symmetric discontinuous Galerkin approximations of reactive transport problems", *Computer Methods in Applied Mechanics and Engineering*, 195, 632-652, 2006. | URL: <http://dx.doi.org/10.1016/j.cma.2005.02.021>
- 149 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "Multiscale angiogenesis modeling using mixed finite element methods", *Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal*, 4(4), 1137-1167, 2005. | URL: <http://dx.doi.org/10.1137/050624443>
- 150 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "Nonlinear behaviors of capillary formation in a deterministic angiogenesis model", *Nonlinear Analysis*, 63(5-7), e2237-e2246, 2005. | URL: <http://dx.doi.org/10.1016/j.na.2005.01.066>
- 151 S. Sun and M. F. Wheeler, "Symmetric and nonsymmetric discontinuous Galerkin methods for reactive transport in porous media", *SIAM Journal on Numerical Analysis*, 43(1), 195-219, 2005. | URL: <http://dx.doi.org/10.1137/S003614290241708X>
- 152 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "A deterministic model of growth factor-induced angiogenesis", *Bulletin of Mathematical Biology*, 67(2), 313-337, 2005. | URL: <http://dx.doi.org/10.1016/j.bulm.2004.07.004>
- 153 S. Sun and M. F. Wheeler, "Discontinuous Galerkin methods for coupled flow and reactive transport problems", *Applied Numerical Mathematics*, 52(2-3), 273-298, 2005. | URL: <http://dx.doi.org/10.1016/j.apnum.2004.08.035>
- 154 S. Sun and M. F. Wheeler, " $L^2(H^1)$ norm a posteriori error estimation for discontinuous Galerkin approximations of reactive transport problems", *Journal of Scientific Computing*, 22(1), 501-530, 2005. | URL: <http://dx.doi.org/10.1007/s10915-004-4148-2>
- 155 C. Dawson, S. Sun and M. F. Wheeler, "Compatible algorithms for coupled flow and transport", *Computer Methods in Applied Mechanics and Engineering*, 193, 2565-2580, 2004. | URL: <http://dx.doi.org/10.1016/j.cma.2003.12.059>
- 156 S. Sun, S. Wang and K. T. Yu, "Theoretical study on the effect of axial liquid back-mixing on distillation in a packed column", *Chemical Engineering (China)*, 27(4), 7-10, 1999. [Chemical Abstracts 131:288165b]
- 157 S. Sun, A. Zeng, S. Wang and K. T. Yu, "Three-dimensional simulation of distillation column containing structured packing (II) validation of model and the effect of liquid distribution and mixing behavior on distillation", *Journal of Chemical Industry and Engineering (China)*, 49(5), 560-565, 1998. [Chemical Abstracts 129:318090b]
- 158 S. Sun, S. Wang and K. T. Yu, "Three-dimensional simulation of distillation column containing structured packing (I) physical model and equations", *Journal of Chemical Industry and Engineering (China)*, 49(5), 549-559, 1998. [Chemical Abstracts 129:318089h]
- 159 S. Sun, S. Wang and K. T. Yu, "Liquid mixing behavior in a column containing structured packing", *Journal of Chemical Industry and Engineering (China)*, 49(1), 121-124, 1998. [Chemical Abstracts 128:296299b]
- 160 D. Li and S. Sun, "Absorption characteristics of color and iron in MSG solution by granular activated carbon", *Journal of Southwest China Normal University (Natural Science Edition)*, 23(6): 688-692, 1998.
- 161 S. Sun*, S. Wang and K. T. Yu, "Effective liquid velocity in a column containing corrugated metal sheet packing", *Journal of Chemical Industry and Engineering (China)*, 48(6), 736-739, 1997. [Chemical Abstracts 128:77071t]
- 162 S. Sun*, W. Yin, J. Chen and Z. Jiang, "A fast method for calculating adsorption kinetics in Monte Carlo simulation for the system of randomly moving particles", *Chemical Engineering (China)*, 24(5), 65-70 & 40, 1996. [Chemical Abstracts 127:20192h]
- 163 S. Sun, W. Niu and Z. Jiang, "Stochastic model of periodic operation performance for the continuous counter-current adsorption process", *Chinese Journal of Reactive Polymers (in English)*, 4(1-2), 8-19, 1995.

Refereed Proceedings Publications

- 1 Jisheng Kou and Shuyu Sun, “Dual-mixed finite elements for the three-field Stokes model as a finite volume method on staggered grids Author links open overlay panel”, *Procedia Computer Science*, Volume 108, 2017, Pages 2265-2274, International Conference on Computational Science 2017, ICCS 2017, 12-14 June, 2017, Zürich, Switzerland. | URL: <https://doi.org/10.1016/j.procs.2017.05.093>
- 2 Tao Zhang, Shuyu Sun, and Bo Yu, “A fast algorithm to simulate droplet motions in oil/water two phase flow”, *Procedia Computer Science*, Volume 108, 2017, Pages 1953-1962, International Conference on Computational Science 2017, ICCS 2017, 12-14 June, 2017, Zürich, Switzerland. | URL: <https://doi.org/10.1016/j.procs.2017.05.175>
- 3 Mohamed F. El-Amin, Ahmed M. Saad, Shuyu Sun, and Amgad Salama, “Numerical simulation of magnetic nanoparticles injection into two-phase flow in a porous medium”, *Procedia Computer Science*, Volume 108, 2017, Pages 2260-2264, International Conference on Computational Science 2017, ICCS 2017, 12-14 June, 2017, Zürich, Switzerland. | URL: <https://doi.org/10.1016/j.procs.2017.05.010>
- 4 Z. Amir, Huangxin Chen, and Shuyu Sun, “Reduced fracture finite element model analysis of an efficient two-scale hybrid embedded fracture model”, *Procedia Computer Science*, Volume 108, 2017, Pages 1873-1882, International Conference on Computational Science 2017, ICCS 2017, 12-14 June, 2017, Zürich, Switzerland. | URL: <https://doi.org/10.1016/j.procs.2017.05.052>
- 5 M. Hussain, B. Saad, A. Negara, and S. Sun, “Understanding the true stimulated reservoir volume in shale reservoirs”, SPE Kingdom of Saudi Arabia Annual Technical Symposium and Exhibition, Dammam, Saudi Arabia, 24-27 April, 2017. [Document ID: SPE-188055-MS] | URL: <https://doi.org/10.2118/188055-MS>
- 6 M. F. El-Amin, J. Kou, and S. Sun, “A multiscale time-splitting discrete fracture model of nanoparticles transport in fractured porous media”, SPE Kingdom of Saudi Arabia Annual Technical Symposium and Exhibition, Dammam, Saudi Arabia, 24-27 April, 2017. [Document ID: SPE-188001-MS] | URL: <https://doi.org/10.2118/188001-MS>
- 7 A. Saad, A. Kadoura, and S. Sun, “Multi-scale coupling between Monte Carlo molecular simulation and Darcy-scale flow in porous media,” *Procedia Computer Science*, Volume 80, 2016, Pages 1354–1363, International Conference on Computational Science 2016, ICCS 2016, 6-8 June 2016, San Diego, California, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2016.05.428>
- 8 H. Chen and S. Sun, “A two-scale reduced model for Darcy flow in fractured porous media,” *Procedia Computer Science*, Volume 80, 2016, Pages 1324–1333, International Conference on Computational Science 2016, ICCS 2016, 6-8 June 2016, San Diego, California, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2016.05.417>
- 9 M. El-Amin, J. Kou, A. Salama, and S. Sun, “An iterative implicit scheme for nanoparticles transport with two-phase flow in porous media,” *Procedia Computer Science*, Volume 80, 2016, Pages 1344–1353, International Conference on Computational Science 2016, ICCS 2016, 6-8 June 2016, San Diego, California, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2016.05.423>
- 10 X. Fan, J. Kou, Z. Qiao, and S. Sun, “Modeling pore-scale oil-gas systems using gradient theory with Peng-Robinson equation of state,” *Procedia Computer Science*, Volume 80, 2016, Pages 1364–1373, International Conference on Computational Science 2016, ICCS 2016, 6-8 June 2016, San Diego, California, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2016.05.434>
- 11 T. Zhang, A. Salama, S. Sun, and H. Zhong, “Compact numerical implementation for solving Stokes equations using matrix-vector operations,” *Procedia Computer Science*, Volume 51, 2015, Pages 1208–1218, International Conference On Computational Science, ICCS 2015 — Computational Science at the Gates of Nature. | URL: <http://dx.doi.org/10.1016/j.procs.2015.05.297>
- 12 T. Strauss, X. Fan, S. Sun, and T. Khan, “Statistical Inversion of Absolute Permeability in Single-phase Darcy Flow,” *Procedia Computer Science*, Volume 51, 2015, Pages 1188–1197, International Conference On Computational Science, ICCS 2015 — Computational Science at the Gates of Nature. | URL: <http://dx.doi.org/10.1016/j.procs.2015.05.291>
- 13 A. Salama, S. Sun, and M. F. El Amin, “An algorithm for the numerical solution of the pseudo compressible Navier-Stokes equations based on the experimenting fields approach,” *Procedia Computer Science*, Volume 51, 2015, Pages 1229–1238, International Conference On Computational Science, ICCS 2015 — Computational Science at the Gates of Nature. | URL: <http://dx.doi.org/10.1016/j.procs.2015.05.303>

- 14 M.F. El-Amin, R. Meftaha, A. Salama, and S. Sun, "Numerical treatment of two-phase flow in porous media including specific interfacial area," *Procedia Computer Science*, Volume 51, 2015, Pages 1249–1258, International Conference On Computational Science, ICCS 2015 — Computational Science at the Gates of Nature. | URL: <http://dx.doi.org/10.1016/j.procs.2015.05.306>
- 15 A. Kadoura, A. Salama, and S. Sun, "Switching between the NVT and NpT ensembles using the reweighting and reconstruction scheme," *Procedia Computer Science*, Volume 51, 2015, Pages 1259–1268, International Conference On Computational Science, ICCS 2015 — Computational Science at the Gates of Nature. | URL: <http://dx.doi.org/10.1016/j.procs.2015.05.309>
- 16 A. Negara, A. Salama, S. Sun, M. Elgassier, and Y.-S. Wu, "Numerical simulation of natural gas flow in anisotropic shale reservoirs," Abu Dhabi International Petroleum Exhibition and Conference, Abu Dhabi, UAE, 9-12 November, 2015. [Document ID: SPE-177481-MS] | URL: <http://dx.doi.org/10.2118/177481-MS>
- 17 M. Chen, S. Sun, and A. Salama, "Advanced algebraic multigrid solvers for subsurface flow simulation," Second EAGE Workshop on High Performance Computing for Upstream, 2015. | URL: <http://dx.doi.org/10.3997/2214-4609.201414032> and <http://hdl.handle.net/10754/579838>
- 18 M.F. El-Amin, S. Sun, A. Salama, "An efficient scheme for two-phase flow in porous media including dynamic capillary pressure," *Proceedings of the World Congress on Engineering 2014 Vol II, WCE 2014*, July 2 - 4, 2014, London, U.K.
- 19 D. Mukherjee, Z. Zaky, T. Zohdi, A. Salama, and S. Sun, "Investigation of noninvasive healing of damaged piping system using electro-magneto-mechanical methods", SPE (Society of Petroleum Engineers) International Oilfield Corrosion Conference and Exhibition, Aberdeen, Scotland, 12-13 May 2014. [Document ID: SPE-169639-MS] | URL: <http://dx.doi.org/10.2118/169639-MS>
- 20 K. Katterbauer, I. Hoteit, and S. Sun, "Improving reservoir history matching of EM heated heavy oil reservoirs via cross-well seismic tomography", SPE (Society of Petroleum Engineers) Heavy Oil Conference-Canada, Alberta, Canada, 10-12 June 2014. [Document ID: SPE-170004-MS] | URL: <http://dx.doi.org/10.2118/170004-MS>
- 21 A. Negara, A. Salama, and S. Sun, "Density-driven flow simulation in anisotropic porous media: application to CO₂ geological sequestration", SPE (Society of Petroleum Engineers) Saudi Arabia Section Technical Symposium and Exhibition, Al-Khobar, Saudi Arabia, 21-24 April 2014. [Document ID: SPE-172232-MS] | URL: <http://dx.doi.org/10.2118/172232-MS>
- 22 K. Katterbauer, I. Hoteit, and S. Sun, "Data assimilation of InSAR measurements for large scale reservoirs", SPE (Society of Petroleum Engineers) Saudi Arabia Section Technical Symposium and Exhibition, Al-Khobar, Saudi Arabia, 21-24 April 2014. [Document ID: SPE-172211-MS] | URL: <http://dx.doi.org/10.2118/172211-MS>
- 23 K. Katterbauer, I. Hoteit, and S. Sun, "A time domain update method for reservoir history matching of electromagnetic data", Offshore Technology Conference-Asia, Kuala Lumpur, Malaysia, 25-28 March 2014. [Document ID: OTC-24916-MS] | URL: <http://dx.doi.org/10.4043/24916-MS>
- 24 S. Sun, D. Keyes, and L. Liu, "Fully implicit two-phase reservoir simulation with the additive Schwarz preconditioned inexact Newton method", SPE Reservoir Characterization and Simulation Conference and Exhibition, 16-18 September, Abu Dhabi, UAE, 2013. [Document ID: SPE-166062-MS] | URL: <http://dx.doi.org/10.2118/166062-MS>
- 25 S. Sun, A. Salama, and A. Negara, "3D numerical investigation of subsurface flow in anisotropic porous media using multipoint flux approximation method", SPE Reservoir Characterization and Simulation Conference and Exhibition, 16-18 September, Abu Dhabi, UAE, 2013. [Document ID: SPE-165960-MS] | URL: <http://dx.doi.org/10.2118/165960-MS>
- 26 M.F. El-Amin, S. Sun, and A. Salama, "On the stability of the finite difference based lattice Boltzmann method", 2013 International Conference on Computational Science, Barcelona, Spain, June 5-7, 2013, published in *Procedia Computer Science*, Volume 18, Pages 2101–2108, 2013. | URL: <http://dx.doi.org/10.1016/j.procs.2013.05.380>
- 27 A. Kadoura, A. Salama, S. Sun, and A. Sherik, "An NPT Monte Carlo molecular simulation-based approach to investigate solid-vapor equilibrium: Application to elemental sulfur-H₂S system", 2013 International Conference on Computational Science, Barcelona, Spain, June 5-7, 2013, published in *Procedia Computer Science*, Volume 18, Pages 2109–2116, 2013. | URL: <http://dx.doi.org/10.1016/j.procs.2013.05.381>
- 28 S. Sun, A. Kadoura, and A. Salama, "An efficient method of reweighting and reconstructing Monte Carlo molecular simulation data for extrapolation to different temperature and density conditions", 2013

- International Conference on Computational Science, Barcelona, Spain, June 5-7, 2013, published in *Procedia Computer Science*, Volume 18, Pages 2147–2156, 2013. | URL: <http://dx.doi.org/10.1016/j.procs.2013.05.385>
- 29 M. F. El-Amin, S. Sun, A. Salama, “Enhanced oil recovery by nanoparticles injection: modeling and simulation,” SPE Middle East Oil and Gas Show and Exhibition, held in Manama, Bahrain, 10–13 March 2013. [Document ID: 164333-MS] | URL: <http://dx.doi.org/10.2118/164333-MS>
 - 30 R. Allen, T. Reis, and S. Sun, “A new lattice Boltzmann equation to simulate density-driven convection of carbon dioxide”, SPE Reservoir Simulation Symposium, 18-20 February, The Woodlands, Texas, USA, 2013. [Document ID: SPE-163658-MS] | URL: <http://dx.doi.org/10.2118/163658-MS>
 - 31 K. Bao, M. Yan, L. Lu, R. Allen, A. Salama, K. E. Jordan, and S. Sun, “High-performance modeling of CO₂ sequestration by coupling reservoir simulation and molecular dynamics”, SPE Reservoir Simulation Symposium, 18-20 February, The Woodlands, Texas, USA, 2013. [Document ID: SPE-163621-MS] | URL: <http://dx.doi.org/10.2118/163621-MS>
 - 32 M.F. El-Amin, S. Sun, and A. Salama, “Modeling and simulation of nanoparticle transport in multiphase flows in porous media: CO₂ sequestration,” In: *Mathematical Methods in Fluid Dynamics and Simulation of Giant Oil and Gas Reservoirs*, Istanbul, Turkey, 3-5 September 2012. [Document ID: SPE-163089-MS] | URL: <http://dx.doi.org/10.2118/163089-MS>
 - 33 A. Salama, S. Sun, and M. F. ElAmin, “A novel numerical approach for the solution of the problem of two-phase, immiscible flow in porous media: Application to LNAPL and DNAPL”, AIP Conf. Proc. 1453, pp. 135-140 (6 pages), 4th International Conference on Porous Media and its Applications in Science, Engineering and Industry, June 17-22, 2012, Potsdam, Germany. | URL: <http://dx.doi.org/10.1063/1.4711165>
 - 34 H. Osman, A. Salama, S. Sun, and K. Bao, “A finite difference, multipoint flux numerical approach to flow in porous media: Numerical examples”, AIP Conf. Proc. 1453, pp. 217-222 (6 pages), 4th International Conference on Porous Media and its Applications in Science, Engineering and Industry, June 17-22, 2012, Potsdam, Germany. | URL: <http://dx.doi.org/10.1063/1.4711178>
 - 35 A. Salama, A. Azamatov, M.F. El-Amin, S. Sun, and H. Huang, “CFD investigation of flow and heat transfer of nanofluids in isoflux spirally fluted tubes,” SPE International Oilfield Nanotechnology Conference and Exhibition, 12–14 June 2012, Noordwijk, The Netherlands. [Document ID: SPE-154466-MS] | URL: <http://dx.doi.org/10.2118/154466-MS>
 - 36 M.F. ElAmin, A. Salama, and S. Sun, “Modeling and simulation of nanoparticle transport in a two phase flow in porousmedia,” SPE International Oilfield Nanotechnology Conference and Exhibition, 12–14 June 2012, Noordwijk, The Netherlands. [Document ID: SPE-154972-MS] | URL: <http://dx.doi.org/10.2118/154972-MS>
 - 37 S. Sun, A. Salama, and M. F. El-Amin, “An equation-type approach for the numerical solution of the partial differential equations governing transport phenomena in porous media,” In: *Procedia Computer Science*, Volume 9, 2012, Pages 661–669, Proceedings of ICCS 2012 (International Conference on Computational Science), June 4-6, 2012, Omaha, Nebraska, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2012.04.071>
 - 38 M.F. El-Amin, A. Salama, and S. Sun, “A conditionally stable scheme for a transient flow of a non-Newtonian fluid saturating a porous medium”, In: *Procedia Computer Science*, Volume 9, 2012, Pages 651–660, Proceedings of ICCS 2012 (International Conference on Computational Science), June 4 -6, 2012, Omaha, Nebraska, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2012.04.070>
 - 39 M. Lieb, T. Neckela, H.-J. Bungartz, and S. Sun, “Towards a Navier Stokes - Darcy upscaling based on permeability tensor computation,” In: *Procedia Computer Science*, Volume 9, 2012, Pages 717–726, Proceedings of ICCS 2012 (International Conference on Computational Science), June 4 -6, 2012, Omaha, Nebraska, USA. | URL: <http://dx.doi.org/10.1016/j.procs.2012.04.077>
 - 40 R. Allen and S. Sun, “Carbon dioxide sequestration: modeling the diffusive and convective transport under a CO₂ cap,” In: *2012 SPE Saudi Arabia Section Technical Symposium and Exhibition*, Al-Khobar, Saudi Arabia, 8–11 April 2012. [Document ID: SPE-160881-MS] | URL: <http://dx.doi.org/10.2118/160881-MS>
 - 41 A. Salama, S. Sun, and M.F. El-Amin, “An efficient IMPES-based, shifting matrix algorithm to simulate two-phase, immiscible flow in porous media with application to CO₂ sequestration in the subsurface,” In: *Proceedings of Carbon Management Technology Conference*, Feb 7-9, 2012, Orlando, Florida, USA. [Document ID: CMTC-150291-MS] | URL: <http://dx.doi.org/10.7122/150291-MS>

- 42 M F El-Amin, A Negara, A Salama, S Sun, "Simulation of coupled flow and mechanical deformation using implicit pressure-displacement explicit saturation (IMPDES) scheme", In: *2012 SPE Middle East Unconventional Gas Conference and Exhibition*, Abu Dhabi, UAE, 23–25 January 2012. [Document ID: SPE-150855-MS] | URL: <http://dx.doi.org/10.2118/150855-MS>
- 43 M.F. El-Amin, A. Negara, A. Salama, K. Bao, and S. Sun, "CO₂ injection into oil reservoir associated with structural deformation," SPE Saudi Arabia Section Technical Symposium and Exhibition, Al-Khobar, Saudi Arabia, 8-11 April 2012. [Document ID: SPE-160830-MS] | URL: <http://dx.doi.org/10.2118/160830-MS>
- 44 J. Li, S. Sun, and V. Calo, "Monte Carlo molecular simulation of phase-coexistence for oil production and processing," In: *2011 SPE Reservoir Characterization and Simulation Conference and Exhibition (RCSC)*, Abu Dhabi, UAE, 9-11 October 2011. [Document ID: SPE-148282-MS] | URL: <http://dx.doi.org/10.2118/148282-MS>
- 45 M. El-Amin and S. Sun, "A finite difference scheme for double-diffusive unsteady free convection from a curved surface to a saturated porous medium with a non-Newtonian fluid," In: *Procedia Computer Science*, Volume 4, 2011, Pages 948–957, Proceedings of ICCS 2011, Singapore, June 1-3, 2011. | URL: <http://dx.doi.org/10.1016/j.procs.2011.04.100>
- 46 M. F. El-Amin, A. Negara, A. Salama, and S. Sun, "Modeling and simulation of structural deformation of isothermal subsurface flow and carbon dioxide injection," In: *2011 SPE Saudi Arabia Section Technical Symposium and Exhibition*, held in AlKhobar, Saudi Arabia, 15–18 May 2011. [Document ID: SPE-149073-MS] | URL: <http://dx.doi.org/10.2118/149073-MS>
- 47 M. F. El-Amin , S. Sun, M. A. El-Ameen, and Y. A. Jaha, "Horizontal H₂-air turbulent buoyant jet resulting from hydrogen leakage", *Proceedings of ICRE2011*, International Conference on Renewable Energy (ICRE2011), Jaipur, India, 17-21 January 2011.
- 48 M. F. El-Amin and S. Sun, "Uniform and non-uniform inlet temperature of a vertical hot water jet injected into a rectangular tank," in: *2010 3rd International Conference on Thermal Issues in Emerging Technologies Theory and Applications (ThETA 3)*, pages 395-403, Cairo, Egypt, Dec 19-22nd, 2010. | URL: <http://dx.doi.org/10.1109/THETA.2010.5766422>
- 49 C. Dong and S. Sun, "Simulation of contaminant transport in fractured porous media on triangular meshes", in: *Proceedings of ICCIS2010*, Pages 136-139, the 2010 International Conference on Computational and Information Sciences, Chengdu, Sichuan, China, December 17 - 19, 2010. | URL: <http://dx.doi.org/10.1109/ICCIS.2010.39>
- 50 S. Sun and A. Firoozabadi, "Compositional modeling in three-phase flow for CO₂ and other fluid injections using higher-order finite element methods", In: *Proceedings of the SPE Annual Technical Conference and Exhibition*, New Orleans, Louisiana, October 4-7, 2009. [Document ID: SPE-124907-MS] | URL: <http://dx.doi.org/10.2118/124907-MS>
- 51 S. Sun and J. Geiser, "Multiscale discontinuous Galerkin methods for modeling flow and transport in porous media", *Lecture Notes in Computer Science (LNCS) 4487*, Proceedings of ICCS 2007, Part I, Y. Shi et al. (Eds.), pp. 890-897, Beijing, China, May 27-30, 2007. | URL: http://dx.doi.org/10.1007/978-3-540-72584-8_117
- 52 V. Krzhizhanovskaya and S. Sun, "Simulation of multiphysics multiscale systems: introduction to the ICCS'2007 Workshop", *Lecture Notes in Computer Science (LNCS) 4487*, Proceedings of ICCS 2007, Part I, Y. Shi et al. (Eds.), pp. 755-761, Beijing, China, May 27-30, 2007. | URL: http://dx.doi.org/10.1007/978-3-540-72584-8_100
- 53 A. A. Rodriguez, H. Klie, S. Sun, X. Gai, M.F. Wheeler, H. Florez, and U. Simon Bolivar, "Porous media upscaling of hydraulic properties: full permeability tensor and continuum scale simulations", In: *Proceedings of the 2006 SPE Symposium on Improved Oil Recovery*, Tulsa, Oklahoma, USA, April 22-26, 2006. [Document ID: SPE100057] | URL: <http://dx.doi.org/10.2118/100057-MS>
- 54 S. Sun, X. Gai and M. F. Wheeler, "Streamline tracing on unstructured grids", In: *Proceedings of the 2005 SPE Annual Technical Conference and Exhibition*, Dallas, Texas, USA, October 9-12, 2005. [Document ID: SPE 96947] | URL: <http://dx.doi.org/10.2118/96947-MS>
- 55 X. Gai, S. Sun, M. F. Wheeler and H. Klie, "A time stepping scheme for coupled reservoir flow and geomechanics on nonmatching grids", In: *Proceedings of the 2005 SPE Annual Technical Conference and Exhibition*, Dallas, Texas, USA, October 9-12, 2005. [Document ID: SPE 97054] | URL: <http://dx.doi.org/10.2118/97054-MS>
- 56 S. Sun and M. F. Wheeler, "Adaptive discontinuous Galerkin methods for coupled diffusion- and advection-dominated transport phenomena", In: *Proceedings of the 3rd International Conference on*

- Computing, Communication and Control Technologies (CCCT'05)*, Volume I, ISBN: 980-6560-46-9, H.-W. Chu, M. J. Savoie, and B. Sanchez, Eds., pp. 130-135, Austin, Texas, July 24-27, 2005.
- 57 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "Multiscale angiogenesis modeling", In: *Proceedings of the 2nd International Workshop on Simulation of Multiphysics Multiscale Systems (in conjunction with the ICCS'2005 conference)*, Part III, pp 96-103, Atlanta, Georgia, May 22-25, 2005. | URL: http://dx.doi.org/10.1007/11428862_13
 - 58 S. Sun and M. F. Wheeler, "A dynamic, adaptive, locally conservative and nonconforming solution strategy for transport phenomena in chemical engineering", In: *Proceedings of the American Institute of Chemical Engineers (AIChE) 2004 Annual Meeting*, Austin, Texas, November 7-12, 2004.
 - 59 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "Deterministic simulation of growth factor-induced angiogenesis", In: *Proceedings of the American Institute of Chemical Engineers (AIChE) 2004 Annual Meeting*, Austin, Texas, November 7-12, 2004.
 - 60 S. Sun and M. F. Wheeler, "Mesh adaptation strategies for discontinuous Galerkin methods applied to reactive transport problems", In: *Proceedings of the 2nd International Conference on Computing, Communication and Control Technologies (CCCT'04)*, Volume I, ISBN: 980-6560-17-5, H.-W. Chu, M. Savoie, and B. Sanchez, Eds., pp. 223-228, Austin, Texas, August 14-17, 2004.
 - 61 S. Sun, M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr., "Nonlinear behavior of capillary formation in a deterministic angiogenesis model", In: *Proceedings of the 4th World Congress of Nonlinear Analysts*, Orlando, Florida, June 30 - July 7, 2004.
 - 62 S. Sun, B. Riviere and M. F. Wheeler, "A combined mixed finite element and discontinuous Galerkin method for miscible displacement problems in porous media", In: *Proceedings of International Symposium on Computational and Applied PDEs held at Zhangjiajie National Park of China*, pp. 321-348, 2002.
 - 63 S. Sun, S. Wang and K. T. Yu, "The liquid mixing behavior in a column containing corrugated structured packing", In: *Proceeding of the 2nd China-US Conference in Chemical Engineering*, pp. 443-446, CIESC and AIChE, Beijing, China, 1997.

Non-Refereed Publication in Proceedings and Special Issues

- 1 A. Salama, S. Sun, M. F. El-Amin, Y. Wang, and K. Kumar, "Flow and transport in porous media: a multiscale focus," *Geofluids*, vol. 2017, Article ID 7579015, 3 pages, 2017. | URL: <http://dx.doi.org/10.1155/2017/7579015>
- 2 B. Yu, Y. Li, X. Liu, P. R. de S. Mendes, J. C. Chai, and S. Sun, "Advances in petroleum storage and transportation engineering", *Advances in Mechanical Engineering*, vol. 7 no. 2, pp. 1-2, 2015. | URL: <http://dx.doi.org/10.1177/1687814014568490>
- 3 S. Sun and I. Yotov, "Special issue in honor of Prof. Mary F. Wheeler: Simulations of subsurface flow and transport (Editorial)," *Computer Methods in Applied Mechanics and Engineering*, Volume 292, Pages 1-2, 1 August 2015. | URL: <http://dx.doi.org/10.1016/j.cma.2015.02.002>
- 4 S. Sun, M. F. El-Amin, and J. Lin, "Mathematical and computational analyses of flow and transport phenomena," *Abstract and Applied Analysis*, Volume 2014, Article ID 381619, 2 pages, 2014. | URL: <http://dx.doi.org/10.1155/2014/381619>
- 5 S. Sun, M.F. El-Amin, and B. Yu, "Mathematical and numerical modeling of flow and transport 2013," *Journal of Applied Mathematics*, Volume 2014, Article ID 320831, 2 pages, 2014. | URL: <http://dx.doi.org/10.1155/2014/320831>
- 6 B. Yu, T. Kunugi, T. Tagawa, S. Sun, M. Wang, and Y. Wang, "Numerical simulation of fluid flow and heat transfer processes," *Advances in Mechanical Engineering*, Volume 2013, Article ID 497950, 3 pages, 2013. | URL: <http://dx.doi.org/10.1155/2013/497950> or <http://ade.sagepub.com/content/5/497950>
- 7 S. Sun, M. F. El-Amin, Z. Chen, and H. Kanayama, "Mathematical and numerical modeling of flow and transport 2012," *Journal of Applied Mathematics*, vol. 2012, Article ID 318496, 4 pages, 2012. | URL: <http://dx.doi.org/10.1155/2012/318496>
- 8 S. Sun, E. W. Jenkins, Z. Chen, and J. Geiser, "Mathematical and numerical modeling of flow and transport," *Journal of Applied Mathematics*, vol. 2011, Article ID 901380, 4 pages, 2011. | URL: <http://dx.doi.org/10.1155/2011/901380>
- 9 S. Sun and M. F. Wheeler, "Dynamically adaptive discontinuous Galerkin methods for contaminant transport in porous media", In: *Proceedings of the M&C-2005 International Topical Meeting on*

- Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear and Biological Applications*, Palais des Papes, Avignon, France, September 12-15, 2005, on CD-ROM, American Nuclear Society, LaGrange Park, IL, 2005.
- 10 M. F. Wheeler, O. Eslinger, S. Sun and B. Riviere, “Discontinuous Galerkin method for modeling flow and reactive transport in porous media”, In: *Proceedings of the 2002 CANUM conference*, series ESAIM, 2002.
 - 11 M. Peszynska and S. Sun, “Reactive transport model coupled to multiphase flow models”, In: *Proceedings of XIV International Conference on Computational Methods in Water Resources*, In: *Computational Method in Water Resources*, S. M. Hassanizadeh, R. J. Schotting, W. G. Gray, and G. F. Pinder, Eds., Elsevier, pp. 923–930, Delft, The Netherlands, June, 2002.
 - 12 S. Sun, S. Wang and K. T. Yu, “Liquid distribution in a large scale column containing corrugated plate packing”, In: *Proceedings of the 8th National Conference of Chemical Engineering*, pp. 482-485, Tianjin, China, October 1996.
 - 13 K. T. Yu and S. Sun, “The distillation simulation in a large scale column containing structured packing with three dimensional non-equilibrium mixing-pool model”, In: *Proceedings of the 8th National Conference of Chemical Engineering*, pp. 476-481, Tianjin, China, October 1996.
 - 14 S. Sun and Z. Jiang, “Simulation of multistage fluidized bed adsorption process by Monte Carlo method”, In: *Proceedings of the International Conference of Reactive Polymers*, pp. 143-145, Xi'an, China, 1994.

Technical Reports

(Note: full documents for ICES reports are available online at <http://www.ices.utexas.edu/research/reports/>)

- 1 A. Salama, S. Sun, and M.F. El-Amin, “CO₂ plume migration into the subsurface: numerical investigation using shifting matrix technique,” CSIM Midyear Report, 2011.
- 2 M. F. El-Amin, A. Negara, A. Salama, and S. Sun, “Simulation of CO₂ Injection in layered porous media with structural deformation effect,” CSIM Midyear Report, 2011.
- 3 J. Li, H. Huang, M F ElAmin, and S. Sun, “Monte Carlo molecular simulation of phase equilibrium properties of reservoir fluids with emphasis to sulfur solubility in sour gas”, Report No. 1 to Saudi Aramco (CRPO #: 6510454094) for Q1-2 (1-6 month) Duration of Year 1, Computational Transport Phenomena Laboratory (CTPL), King Abdullah University of Science and Technology (KAUST), July 15, 2011.
- 4 H. Huang, A Salama, M F ElAmin, and S. Sun, “Computing phase equilibrium of two-component reservoir fluids using Monte Carlo molecular simulation”, Report No. 2 to Saudi Aramco (CRPO #: 6510435957) for Q2-4 (4-12 month) Duration of Year 1, Computational Transport Phenomena Laboratory (CTPL), King Abdullah University of Science and Technology (KAUST), July 5, 2011.
- 5 C. Xu, M F ElAmin, and S. Sun, “Gibbs ensemble Monte Carlo simulation of thermodynamic properties of reservoir fluids – literature review”, Report No. 1 to Saudi Aramco (CRPO #: 6510435957) for Q1 (1-3 month) Duration of Year 1, Computational Transport Phenomena Laboratory (CTPL), King Abdullah University of Science and Technology (KAUST), Nov 12, 2010.
- 6 M. F. El-Amin and S. Sun, “A new scaling-law of a two-phase flow in porous media in terms of characteristic velocity”, In: *The CSIM book of 2010 (an annual report of the Center for Subsurface Imaging and Fluid Modeling consortium at KASUT)*, September 2010.
- 7 M. F. El-Amin and S. Sun, “Effects of gravity and inlet location on a two-phase counter-current imbibition in a porous medium”, In: *The CSIM book of 2010 (an annual report of the Center for Subsurface Imaging and Fluid Modeling consortium at KASUT)*, September 2010.
- 8 J. Kou and S. Sun, “A new treatment of capillarity to improve the stability of IMPES two-phase flow formulation”, In: *The CSIM book of 2010 (an annual report of the Center for Subsurface Imaging and Fluid Modeling consortium at KASUT)*, September 2010.
- 9 J. Kou and S. Sun, “An improved iterative IMPES formulation for two-phase flow in heterogeneous porous media with capillarity”, In: *The CSIM book of 2010 (an annual report of the Center for Subsurface Imaging and Fluid Modeling consortium at KASUT)*, September 2010.
- 10 S. Sun and M. F. Wheeler, “Anisotropic and dynamic mesh adaptation for discontinuous Galerkin methods applied to reactive transport”, *ICES Report 05-15*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, March 2005.

- 11 S. Sun and M. F. Wheeler, "Mesh adaptation strategies for discontinuous Galerkin methods applied to reactive transport problems", *ICES Report 04-41*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, August 2004.
- 12 S. Sun and M. F. Wheeler, "Projection methods for constructing a velocity field compatible with transport", *ICES Report 04-16*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, March 2004.
- 13 S. Sun, "Discontinuous Galerkin methods for reactive transport in porous media", *ICES Report 04-1*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, January 2004.
- 14 S. Sun and M. F. Wheeler, "Discontinuous Galerkin methods for coupled flow and reactive transport problems", *TICAM Report 03-49*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, December 2003.
- 15 S. Sun and M. F. Wheeler, "Energy norm *a posteriori* error estimation for discontinuous Galerkin approximations of reactive transport problems", *TICAM Report 03-39*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, August 2003.
- 16 S. Sun and M. F. Wheeler, "*A posteriori* error analyses for symmetric discontinuous Galerkin approximations of reactive transport problems", *TICAM Report 03-19*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, May 2003.
- 17 C. Dawson, S. Sun and M. F. Wheeler, "Compatible algorithms for coupled flow and transport", *TICAM Report 03-12*, Institute for Computational Engineering and Sciences, The University of Texas at Austin, Austin, Texas, April 2003.
- 18 M. Peszynska and S. Sun, "Reactive transport model coupled to multiphase flow models", *TICAM Report 02-04*, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin, Austin, Texas, January 2002.
- 19 M. Peszynska and S. Sun, "Multiphase reactive transport module TRCHEM in IPARS", *TICAM Report 01-32*, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin, Austin, Texas, October 2001.
- 20 M. Peszynska, S. Bryant, S. Sun, T. LaForce and S. Snider, "Modeling of Couplex1 case with IPARS TRCHEM module", *TICAM Report 01-31*, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin, Austin, Texas, October 2001.

Theses

- 1 S. Sun, *Discontinuous Galerkin methods for reactive transport in porous media*, Ph.D. dissertation, The University of Texas at Austin, 2003.
- 2 S. Sun, *Fluid mechanics behavior of liquid phase and its effects on distillation in a column containing structured packing*, Doctor of Engineering dissertation, Tianjin University, 1997.
- 3 S. Sun, *Simulation of multistage fluidized bed adsorption processes by Monte Carlo Methods*, Master's thesis, Tianjin University, 1994.
- 4 S. Sun, *Removal of oil from wastewater by coalescence technology*, Bachelor's thesis, Tianjin University, 1991.

Books / Book Chapters

- 1 M. F. Wheeler, S. Sun and S. G. Thomas, "Modeling of Flow and Reactive Transport in IPARS", In: *Groundwater Reactive Transport Models*, Pages 42-73, Edited by F. Zhang, G.-T. Yeh and J. C. Parker, eISBN: 978-1-60805-306-3, ISBN: 978-1-60805-525-8, Bentham Science Publishers, 2012. | Book URL: <http://dx.doi.org/10.2174/97816080530631120101>; Chapter URL: <http://dx.doi.org/10.2174/978160805306311201010042>
- 2 M. F. El-Amin, A. Salama and S. Sun, "Solute transport with chemical reaction in single- and multiphase porous media," In: M El-Amin (Ed) *Mass Transfer in Multiphase Systems and its Applications*, ISBN 978-953-307-215-9, pp 27-48, Published by INTECH, Rijeka, Croatia, February 2011.
- 3 S. Sun, M. F. Wheeler, M. Obeyesekere and C. Patrick, "Multiscale Angiogenesis Modeling", In: *Lecture Notes in Computer Science*, ISSN 0302-9743, Volume 3516, Pages 96–103, Apr 2005.

- 4 M. F. Wheeler, S. Sun, O. Eslinger and B. Riviere, “Discontinuous Galerkin method for modeling flow and reactive transport in porous media”, In: *Analysis and Simulation of Multifield Problem*, Edited by W. Wendland, ISBN 3540006966, Springer Verlag Publishers, pp. 37–58, August 2003.
- 5 S. Sun, B. Riviere and M. F. Wheeler, “A combined mixed finite element and discontinuous Galerkin method for miscible displacement problems in porous media”, In: *Recent Progress in Computational and Applied PDEs*, Edited by T. F. Chan, Y. Huang, T. Tang, J. Xu and L.-A. Ying, ISBN 0306474204, Kluwer Academic/Plenum Publishers, pp. 321–348, February 2003.
- 6 M. F. El-Amin and S. Sun, “Turbulent buoyant jet of a low-density gas leaks into high-density ambient: Hydrogen leakage in air”, In: *Mass Transfer*, ISBN: 978-953-307-333-0, InTech Publisher, 2011.

Book Chapters Accepted or in Progress

- 7 G. Han, S. Sun and M. Dong, “Capacity collaboration under the risk of production disruptions in semiconductor supply chains,” In: *Supply Chain Coordination and Management*, ISBN: 978-953-7619-X-X, InTech Publisher (in press).
- 8 M. F. El-Amin and S. Sun, “On the Two-Phase Flow in Porous Media: Scaling using Velocity; Open-Boundary and Gravity Effects; Non-Dimensional Analysis; Similarity Solutions; Compositional Modeling (CO₂ Injection); Negative Capillary Pressure Challenge; and Structural Deformation Effect”, In: *Advances in Multiphase Flow and Heat*, Vol. 5, 2011, Edited by L. Cheng and D. Mewes, Bentham Science Publishers Ltd (in press).

Patents

- 1 Y. Wang, S. Sun, B. Yu, and T. Li, Patent in China: 王艺、孙树瑜、宇波、李庭宇. 中国石油大学(北京). 多孔介质全阶渗透率张量的预测方法. 201510385897.9. 2017-07-21. 2017-07-21. (发明)
- 2 Arango Santiago, Shuyu Sun, Hoteit Ibrahim, and Katterbauer Klemens, International patent (King Abdullah University of Science and Technology): Reservoir resistivity characterization incorporating flow dynamics. WO2016051282A2 7-Apr-2016. | URL: <https://www.google.com/patents/WO2016051282A2> and <http://hdl.handle.net/10754/620492>
- 3 Klemens Katterbauer, Ibrahim Hoteit, and Shuyu Sun, US patent (King Abdullah University of Science and Technology): Multi data reservoir history matching and uncertainty quantification framework. US 2017/0067323 A1 Mar. 9, 2017. | URL: <https://patents.google.com/patent/US20170067323A1/en>, also International patent (King Abdullah University of Science and Technology) WO 2015/177653 A2 7-May-2014 | URL: <http://repository.kaust.edu.sa/kaust/handle/10754/619787>

ORAL PRESENTATIONS / INVITED TALKS

- 1 (Invited talk) “Robust iterative algorithms for flash calculation of Peng-Robinson fluids”, presented at the Workshop on Computational Mathematics, Department of Applied Mathematics, The Hong Kong Polytechnic University, at 4:20PM on Monday 11 December 2017.
- 2 (Invited talk) “A robust and energy-stable iterative scheme for two-phase equilibria of multi-component fluids at constant moles, volume and temperature — NVT-Flash in Multiple Spatial Dimensions”, presented at Department of Mathematics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, 3:30pm-4:30pm, Wednesday, Nov 8, 2017.
- 3 (Invited talk) “Modeling and simulation of porous media flow at various scales”, presented at China University of Petroleum (East China), Qingdao, 10:00am-11:30am, Wednesday September 6, 2017.
- 4 (Invited talk) “Efficient algorithms for two-phase flow at pore and Darcy Scales”, presented at the School of Sciences, Guizhou University, August 5, 2017.
- 5 (Contributed talk) “Numerical modeling and simulation of immiscible and partially miscible two-phase flow”, presented at the 10th Anniversary Conference on Nonlinear Analysis and Convex Analysis 2017 (NACA2017), WE4E, July 5; conference held in Chitose City Cultural Center in Hokkaido, Japan in the period July 4-9, 2017.

- 6 (Invited talk) “Multi-scale fluid flow and transport through porous media”, presented at the ISC High Performance conference, Frankfurt, Germany, 2:50-3:15pm on Wed June 21, 2017.
- 7 (Invited talk) “Energy stable algorithms for diffuse interface modeling of partially miscible two-phase systems”, presented at the 3rd International Conference on Engineering and Computational Mathematics (ECM2017), Hong Kong Polytechnic University, June 1, 2017.
- 8 (Invited talk) “Thermodynamically consistent algorithms for multi-component two-phase flows”, presented in the Seminar on Scientific Computation, Department of Mathematics, The Hong Kong University of Science and Technology, in Room 3472, Academic Building (near lifts 25&26), HKUST, 3:00p.m.-4:00p.m., Thursday 6 April 2017.
- 9 “Simulation of gas behaviors in shale: multi-scale and multi-continuum models and molecular simulation”, presented in the 2nd KAUST-Aramco Shale Project Meeting, Aramco, March 9, 2017.
- 10 (Invited) “Thermodynamic consistency of numerical schemes and its application to the simulation of multi-component two-phase flow at pore scales”, presented in AMCS Graduate Seminar at KAUST, Lecture Hall I Room 2322, Building 9, KAUST, Saudi Arabia, 11:45am - 1:00pm, September 8, 2016.
- 11 (Invited) “Efficient and energy-stable algorithms for multi-component two-phase flow”, Presented in the West China Conference on Computational Mathematics, Guiyang, China, August 9, 2016.
- 12 (Contributed) “Computational modeling of partially miscible multi-component two-phase systems in multiple dimensions”, presented in the Fifth Asian Conference on Nonlinear Analysis and Optimization (NAO-Asia 2016), 3:30pm - 4:00pm, August 2, 2016.
- 13 (Invited) “Computational modeling of two-phase flow with partial miscibility”, presented in China University of Petroleum (East China), 2:30pm-4:00pm July 13, 2016.
- 14 (Invited) “Two-phase flow with partial miscibility: modeling and algorithms”, presented in Xiamen University (XMU), Xiamen, 3:00pm-4:00pm, July 7, 2016.
- 15 (Invited) “An adaptive mixed finite element method for Darcy flow in fractured porous media”, presented in the minisymposium of "Numerical Methods for Flow and Fractures in Subsurface Modeling" at the fifteenth conference on the Mathematics of Finite Elements and Applications (MAFELAP), Brunel University, London, UK, 14 - 17 June, 2016.
- 16 (Contributed) “Modeling pore-scale oil-gas systems using gradient theory with PR equation of state”, International Conference on Computational Science (ICCS), San Diego, California, USA, June 6, 2016.
- 17 (Contributed) “A two-scale reduced model for Darcy flow in fractured porous media”, International Conference on Computational Science (ICCS), San Diego, California, USA, June 6, 2016.
- 18 (Invited) “Numerical modeling and simulation of shale gas using molecular simulation and finite element methods,” presented in China Huanqiu Contracting and Engineering Corp. (HQC) of SINOPEC, Beijing, China, 4:30 – 5:30pm, Wednesday May 25, 2016.
- 19 (Invited) “Molecular simulation and finite element methods for the equilibrium and transport behaviors of shale gas,” presented in Beijing Institute of Petrochemical Technology, Beijing, China, 2:00 – 3:00pm, Tuesday May 24, 2016.
- 20 (Invited) “Desorption and transport behaviors of gas in shale using molecular simulation and computational fluid dynamics”, presented in SINOPEC Research Institute of Petroleum Processing (RIPP), Beijing, China, 9:00 – 11:00am, Thursday May 19, 2016.
- 21 (Invited) “Two-scale finite element methods for flow in fractured porous media”, RERI (Reservoir Engineering Research Institute) XXVII Annual Workshop Agenda, Sheraton Hotel, Palo Alto, California, USA, 8:15 – 8:45 am, Friday May 6, 2016 (May 5-6, 2016 for the entire workshop).
- 22 (Invited) “Numerical simulation in unconventional reservoirs: opportunities and challenges”, Guizhou University, Huaxi, Guiyang, China, 4:30 – 5:30pm, Wednesday April 6th, 2016.
- 23 (Invited) “Mathematical challenges of numerical simulation in shale gas reservoirs”, Guizhou Minzu University, Huaxi, Guiyang, China, 2:00 – 3:00pm, Wednesday April 6th, 2016.
- 24 (Invited) “A robust and convergence-guaranteed iterative algorithm for simulating two-phase equilibria of multi-component fluids at constant moles, volume and temperature”, TU801, Department of Applied Mathematics, The Hong Kong Polytechnic University (PolyU), 11 Yuk Choi Road, Hung Hom, Hong Kong, 11:00 am – 12:00 noon, March 31, 2016.
- 25 (Invited) “Simulation of gas behaviors in shale: PDE-based modeling and molecular simulation”, presented in the 1st KAUST-Aramco Shale Project Meeting, Aramco, Dhahran, Saudi Arabia, 8:45am, December 21, 2015.

- 26 (Invited) “Reservoir modeling and simulation in shale gas reservoirs”, presented in 2015 Foundation CMG SUMMIT, Metropolitan Convention Centre, 333 4 Ave SW, Calgary, AB T2P 0J4, Alberta, Canada, September 15-16, 2015.
- 27 (Invited) “Toward pore-scale modeling of multi-component two-phase petroleum fluids”, presented in the Minisymposium of Theoretical and Numerical Studies of Phase Field Model, in the 8th International Congress on Industrial and Applied Mathematics (ICIAM2015), Beijing, Aug 13, 2015.
- 28 (Invited) “Physics-preserving numerical methods for compositional multiphase flow: DG, algorithm compatibility, and multiscale coupling”, presented in the Minisymposium of Advances in Numerical Methods for Porous Media Flow, in the 8th International Congress on Industrial and Applied Mathematics (ICIAM2015), Beijing, Aug 11, 2015.
- 29 (Invited) “Local conservation in oil reservoir simulation: why do we need it from the mathematical point of view?” presented in the School of Mathematical Science, Shangdong University, August 3, 2015.
- 30 (Invited) “Pore-scale modeling of multi-component multi-phase flows”, presented in the minisymposium "Modeling and Numerics for Flow and Transport in Porous Media" in the 2015 SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS15), Stanford University, Stanford, California, USA, June 29 – July 2, 2015.
- 31 (Invited) “Partially miscible two-phase systems at a pore scale: modeling and simulation”, presented in IFP Energies Nouvelles (IFPEN), Paris, France, 3:00pm, Thursday May 28, 2015.
- 32 (Invited) “Statistical inversion of absolute permeability in single-phase Darcy flow,” the Workshop on Flow and Transport: Modeling, Simulations and Algorithms, in conjunction with the International Conference on Computational Science (ICCS 2015), Reykjavik, Iceland June 1-3, 2015.
- 33 (Invited) “A multi-physics approach to understand the flow of gas in shale and other unconventional reservoirs”, the 2014 Annual CSIM Workshop, Omni Hotel in Houston, Texas, USA, February 6, 2015 (February 4-6, 2015 for the entire workshop).
- 34 (Invited) “Toward pore-scale modeling of compositional two-phase flows: Pore-scale investigation of interface tension, capillary pressure, residual saturation, generalized NVT flash, wettability, contact line stick-slip, and contact angle hysteresis,” presented in Institute of Petroleum Engineering, Heriot-Watt University, Edinburgh, United Kingdom, 12:00-1:00pm, January 19, 2015.
- 35 (Invited) “Direct numerical simulations of compositional two-phase flows,” presented at China University of Petroleum, Beijing, China, December 16, 2014.
- 36 (Invited) “A diffuse interface model for compositional two-phase hydrocarbon systems,” presented at the mini-symposium of “Numerical Methods for Deterministic and Stochastic Phase Field Models”, in the 5th International Conference on Scientific Computing and Partial Differential Equations (SCPDE14), Lam Woo International Conference Center, Department of Mathematics, Hong Kong Baptist University Kowloon Tong, Hong Kong, 8-12 December 2014. | URL: <http://www.math.hkbu.edu.hk/SCPDE14/>
- 37 (Invited) “Modeling and computation in shale gas reservoirs”, presented in the College of Science, Guizhou University, Guiyang, China, 10:30am–11:30am, December 5, 2014.
- 38 (Invited) “Simulation of two-phase flow: from pore-scale to Darcy-scale”, presented in 2014 Foundation CMG SUMMIT 2014, The Westin Calgary, 320 4th Ave SW, Calgary, Alberta, Canada, September 24-26, 2014.
- 39 (Invited) “Discontinuous Galerkin for subsurface flow: Local conservation, algorithm compatibility, and multiscale coupling,” International workshop on computational mathematics - Advances in Computational PDEs (an ICM 2014 satellite meeting), Yonsei University, Seoul, South Korea, 16:20-17:00, August 11, 2014 (August 9 -12, 2014 for the entire conference).
- 40 (Invited) “Phase behavior modeling and simulation of hydrocarbon oil-gas fluid systems”, Room TU717, Department of Applied Mathematics, The Hong Kong Polytechnic University (PolyU), 11 Yuk Choi Road, Hung Hom, Hong Kong, 2:30-3:30pm, July 18, 2014.
- 41 (Invited) “Discontinuous Galerkin methods for subsurface multiphase flow”, presented in the 6th International Conference on Porous Media (InterPore 2014), Milwaukee, USA, May 28, 2014 (May 27-30, 2014 for the entire conference).
- 42 (Invited) “Local conservation and its higher-order extension with application in subsurface reservoir simulation”, a seminar talk given in Dept. of Mathematical Sciences, University of Nevada Las Vegas (UNLV), 4500 Maryland Parkway, Las Vegas, Nevada, USA, 11:30am–12:30pm, June 6, 2014.
- 43 (Invited) “Local conservation in subsurface reservoir simulation: Necessity or luxury?” Presented in INRIA Paris-Rocquencourt, Bâtiment 13, Domaine de Voluceau – Rocquencourt, B.P. 105, 78153 Le Chesnay Cedex, France, 11:00-12:00, April 25, 2014.

- 44 (Invited) “Compatibility of algorithms for flow and transport with application to subsurface reservoir simulation”, AMCS Graduate Seminar, Lecture Hall 1, KAUST, Thuwal, Saudi Arabia, 12:00-1:00pm, April 17, 2014.
- 45 (Invited) “Efficient numerical methods of diffusive interface models: to compute interface tension of two-phase petroleum fluid mixture”, NumPor Annual Meeting, Building 19, Exhibition Hall 1, KAUST, Thuwal, Saudi Arabia, Mar 2-3, 2014.
- 46 (Invited) “The pore-scale modeling and simulation of reservoir fluids: from equilibrium properties to dynamics,” the 2013 Annual CSIM Workshop, Omni Hotel in Houston, Texas, USA, February 7, 2014 (February 5-7, 2014 for the entire workshop).
- 47 (Invited) “Simulating Compositional Two-Phase Fluid Systems using a Diffusive Interface Model”, presented in the Conference on Frontiers of Soft Matter Physics: from Non-equilibrium Dynamics to Active Matter, HKUST, Hong Kong, January 13 – 17, 2014.
- 48 (Invited) “Pore-scale simulation of two-phase fluid systems consisting of hydrocarbon components”, presented in the workshop of “Computational mathematics for oil and gas applications”, within ECM2013 (The 2nd International Conference on Engineering and Computational Mathematics), held in The Hong Kong Polytechnic University in Hong Kong from December 16-18, 2013.
- 49 (Invited) “Diffusive interface models for two-phase systems with Peng-Robinson equation of state”, the Annual CSM Industrial Affiliates Meeting, the University of Texas at Austin, Austin, Texas, USA, October 29-30, 2013.
- 50 (Invited) “An efficient method of reweighting and reconstructing Monte Carlo molecular simulation data for extrapolation to different temperature and density conditions”, presented in the International Workshop on Flow and Transport: Modeling, Simulations and Algorithms, within the International Conference on Computational Science (ICCS 2013), Barcelona, Spain, June 5 - June 7, 2013.
- 51 (Invited) “Multiscale Modeling of Compositional Flow with Application to Carbon Sequestration”, Presented in 5th InterPore Meeting, Prague, May 24, 2013.
- 52 (Invited) “Accurate and efficient simulation of compositional multiphase flow in porous media”, Presented in 3rd KICP (KAUST Industry Collaboration Program) Annual Research Symposium, Conference Center, KAUST Campus, 3:15 – 3:45 p.m, Apr 21, 2013.
- 53 (Invited) “High-performance modeling of CO₂ sequestration by coupling reservoir simulation and molecular dynamics”, The Annual NumPor Meeting, Building 3, Room 5220, KAUST, Thuwal, Saudi Arabia, February 2-3, 2013.
- 54 (Invited) “High-performance modeling of CO₂ sequestration by coupling reservoir simulation and molecular dynamics,” the 2012 Annual CSIM Workshop, Omni Hotel in Houston, Texas, USA, February 1, 2013 (January 30 – February 1, 2013 for the entire workshop).
- 55 (Invited) “Compatible algorithms for coupling multiphysics in subsurface flow and transport”, presented in the Workshop on Numerical Analysis and Computational Mathematics, Fourth Floor Auditorium, Building 15, Department of Mathematics and Statistics, King Fahd University of Petroleum and Minerals (KFUPM), 1:45-2:30pm, Tuesday December 4, 2012.
- 56 (Invited) “Multiscale modeling of thermodynamics and compositional flow in porous media”, presented in NumPor Kick-off meeting, Conference Room 5220, Building 3, KAUST, 2:45pm, October 6, 2012.
- 57 (Invited) “A gentle introduction to fluid flow and its interaction with geomechanics and seismology, with application to carbon sequestration”, the KAUST ErSE (Earth Science and Engineering) Seminar, Lecture Hall 1, Building 9, KAUST, Thuwal, Saudi Arabia, 4:15 – 5:15 pm, Sept 25, 2012.
- 58 (Invited) “Modeling of subsurface flow and transport using conservative finite elements”, presented in Symposium on Geophysical Flows, Nanyang Hotel, Xi’an Jiaotong University, Xi’an, China, 3:35 – 4:15 pm, July 22, 2012 (July 22-24, 2012 for the entire symposium).
- 59 (Invited) A series of lectures (teaching together with Zhangxing Chen and Dabao Liu), the Workshop on Modeling and Simulation of Multiphase Flow and Applications to Energy Recovery (多相流数值模拟及其在能源上的应用), Beijing International Center for Computational Physics (BICCP), Beijing, China, Monday, July 9, 2012 – Saturday, July 14, 2012.
- 60 (Invited) “Compatibility of algorithms for flow and transport”, presented in as a special seminar talk in the College of Science, Guizhou University, Guiyang, China, June 27, 2012.
- 61 (Invited) “Compatible finite element simulation of subsurface flow and transport with application to carbon sequestration”, presented in 2012 Foundation CMG Annual Chair meeting, Calgary, Canada, June 18, 2012.

- 62 (Invited) “Compatible algorithms for flow and transport with application to carbon sequestration”, presented in CSE (Computational Science and Engineering) special seminar, Yonsei University, Seoul, Korea, 5:00 pm, June 15, 2012.
- 63 (Invited) “Simulation of flow and transport in subsurface carbon sequestration using conservative finite element methods”, presented in the 2012 International Conference on Applied Mathematics: Modeling, Analysis & Computation, City University of Hong Kong, Hong Kong, May 29, 2012. (May 28 – June 1, 2012 for the entire conference).
- 64 (Invited) “Finite Element Modeling of Hydrology: Coupling of Conservative Methods”, presented in the 4th Annual IAMCS (Institute for Applied Mathematics and Computational Science, Texas A&M University) Spring Symposium, KAUST, Thuwal, Saudi Arabia, 11:25am, May 7, 2012 (May 6 - 7, 2012 for the entire symposium).
- 65 (Invited) “Modeling and simulation of subsurface flow and transport”, presented in 2nd KICP (KAUST Industry Collaboration Program) Annual Research Symposium, KAUST Campus, Bldg 19, Conference Hall 1 & 2, 2:30pm, Thuwal, Saudi Arabia, Apr 23, 2012.
- 66 (Invited) “Simulation of multiphase flow in porous media using locally conservative finite element methods”, presented in The Eighth International Conference on Scientific Computing and Applications, University of Nevada, Las Vegas, USA, 3:00 - 3:30 pm, April 2, 2012 (April 1 - 4, 2012 for the entire conference).
- 67 (Invited) “Towards better understanding of subsurface flow: from the molecular scale to the REV scale,” Presented in the KAUST-ARAMCO-SDCRC Collaboration Meeting on Next Generation Upstream Oil and Gas Technologies, Conference Room 5209, Level 5, Building 4, King Abdullah University of Science & Technology, Thuwal, Saudi Arabia, 11:30-11:50am, March 1, 2012 (February 29 – March 1, 2012 for the entire meeting).
- 68 (Invited) “Overview of molecular simulation & other research in the Computational Transport Phenomena Lab (CTPL) at KAUST”, presented in the R and D Center, Saudi Aramco Oil Company, Dhahran, Saudi Arabia, February 22, 2012.
- 69 (Invited) “Overview of reservoir simulation research at KAUST,” the 2011 Annual CSIM Workshop, Omni Hotel in Houston, Texas, USA, 11:30-11:50am, February 10, 2012 (February 8-10, 2012 for the entire meeting).
- 70 (Contributed, with M. F. El-Amin et al) “Simulation of coupled flow and mechanical deformation using implicit pressure-displacement explicit saturation (IMPDES) scheme”, presented in: 2012 SPE Middle East Unconventional Gas Conference and Exhibition, Abu Dhabi, UAE, January 23–25, 2012.
- 71 (Invited) “Overview of research in the Computational Transport Phenomena Lab (CTPL) at KAUST”, presented in EXPEC Advanced Research Center, Bldg 137, Saudi Aramco Oil Company, Dhahran, Saudi Arabia, December 13, 2011.
- 72 (Invited) “Finite Difference Methods (FDM) derived from Mixed Finite Element Methods (FEM) for subsurface flow”, School of Mathematical Sciences, South China Normal University, Guangzhou, China, 4:30-5:30pm, November 5, 2011.
- 73 (Contributed, with J. Li et al), “Monte Carlo molecular simulation of phase-coexistence for oil production and processing,” presented in: 2011 SPE Reservoir Characterization and Simulation Conference and Exhibition (RCSC), Abu Dhabi, UAE, October 9-11, 2011.
- 74 (Invited) “Evaluation of sulfur solubility in natural gas with molecular simulation,” Saudi Aramco–KAUST 2nd Research Oversight Committee Meeting, Bld 16, L3, Rm 3103, KAUST, Thuwal, Saudi Arabia, September 12, 2011.
- 75 (Invited) “Modeling multi-component phase equilibrium of reservoir fluids with molecular simulation,” Saudi Aramco–KAUST 2nd Research Oversight Committee Meeting, Bld 16, L3, Rm 3103, KAUST, Thuwal, Saudi Arabia, September 12, 2011.
- 76 (Invited) “Fluid dynamics and thermodynamics of petroleum reservoirs: an introduction to their modeling and simulation (Part II)”, presented in Conf Room 404, Science Building, Xi’an Jiaotong University, Xi’an, China, 9:00-10:00am, Thursday July 28, 2011.
- 77 (Invited) “Fluid dynamics and thermodynamics of petroleum reservoirs: an introduction to their modeling and simulation (Part I)”, presented in Conf Room 404, Science Building, Xi’an Jiaotong University, Xi’an, China, 9:00-10:00am, Tuesday July 26, 2011.
- 78 (Invited) “Reservoir Simulation: an Introduction to Subsurface Multiphase Flow”, presented in Building Stauffer III, Department of Chemical Engineering, Stanford University, Palo Alto, California, 3:00-4:30pm, July 11, 2011.

- 79 (Invited) “Multi-purpose simulation for subsurface flow and transport”, presented in the 2011 Foundation CMG Annual Research Chairs Meeting, University of Calgary, Calgary, Canada, July 5, 2011.
- 80 (Invited) “Simulations of porous media flow and transport by discontinuous Galerkin and enriched Galerkin finite elements”, presented in the 2011 International Conference on Applied and Computational Mathematics and Interdisciplinary Research (ICAMIR), Chern Institute of Mathematics, Nankai University, Tianjin, China. June 13-15, 2011 (my talk: 4:10-4:45pm, June 13, 2011).
- 81 (Invited) “Understanding Finite Difference Methods (FDM) from the point of view of Finite Element Methods (FEM)”, School of Mathematics and Computer Science, Guizhou Normal University, Guiyang, China, 3:00pm, June 10, 2011.
- 82 (Invited, with M. El-Amin), “A finite difference scheme for double-diffusive unsteady free convection from a curved surface to a saturated porous medium with a non-Newtonian fluid,” presented in *International Workshop on Flow and Transport: Computational Challenges*, within the International Conference on Computational Science (ICCS 2011), Nanyang Technological University, Singapore, June 1-3, 2011.
- 83 (Contributed, with A. Negara et al), “Modeling and simulation of structural deformation of isothermal subsurface flow and carbon dioxide injection,” presented in: 2011 SPE Saudi Arabia Section Technical Symposium and Exhibition, held in AlKhobar, Saudi Arabia, 15–18 May 2011.
- 84 (Invited) “Reservoir simulation: overview of research on the modeling and computation of subsurface flow and transport”, presented in the first Annual KICP (KAUST Industry Collaboration Program) Research Symposium, KAUST, Thuwal, Saudi Arabia, 5:30pm, May 2, 2011.
- 85 (Invited, with Jerry Schuster), “Overview of the research at the Center for Subsurface Imaging and Fluid Flow Modeling, Part II: Reservoir Simulation”, presented in the Coding Days Workshop, a meeting between KAUST and Partners from The Technical University of Munich (TUM), Building 1, KAUST, Thuwal, Saudi Arabia, 11:00am, April 20, 2011 (Part I was presented by Prof. Jerry Schuster).
- 86 (Invited) “Reservoir Simulation Research at KAUST”, presented in the Inaugural Dinner of the SPE Student Chapter at KAUST, Fellowship Hall, Student Center, KAUST, Thuwal, Saudi Arabia, 7:15pm, April 18, 2011.
- 87 (Invited) “Mathematics of petroleum reservoir simulation”, School of Mathematics and Computer Science, Guizhou Normal University, Guiyang, China, 10:00–10:00am, April 6, 2011.
- 88 (Contributed, with E. Jenkins and V. Ervin) "Coupled generalized non-linear Stokes flow with flow through porous media", in Session 18, 3:45–4:15pm, April 5, 2011, in the Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia, USA, April 4-7, 2011.
- 89 (Invited) “An implicit approach to treat capillarity of IMPES two-phase flow formulation”, presented in the session of “Advanced numerical modeling”, 3:40-4:00pm, March 31, 2011, in the 3rd International Conference on Porous Media and Annual meeting of the International Society for Porous Media, Bordeaux Campus, France, March 29-31, 2011.
- 90 (Invited) “Incorporation of diffusion into compositional multiphase flow simulation”, presented in the minisymposium of "Large Scale Simulations and Porous Media Applications" in the SIAM Conference on Mathematical & Computational Issues in the Geosciences, Long Beach, California, USA, March 21-24, 2011.
- 91 (Invited) “Enhanced successive substitution algorithm for multiphase flash calculations”, presented in the minisymposium of "Simulation, Optimization and Assimilation of Subsurface Reservoirs" in the SIAM Conference on Mathematical & Computational Issues in the Geosciences, Long Beach, California, USA, March 21-24, 2011.
- 92 (Invited) “Conservative finite element methods for subsurface oil reservoir simulation”, School of Mathematical Sciences, South China Normal University, Guangzhou, China, 10:30-11:30am, March 9, 2011.
- 93 (Invited) “Discontinuous Galerkin and enriched Galerkin finite element simulations of subsurface flow and transport”, Department of Mathematics, Shanghai University, Shanghai, China, 10:00-11:00am, March 7, 2011.
- 94 (Invited) “Two-phase co-current and counter-current imbibition in porous media”, the 2010 Annual CSIM Meeting, Omni Hotel in Houston, Texas, USA, 2:15-2:35pm, January 13, 2011 (January 13-14, 2011 for the entire meeting).

- 95 (Invited Keynote Talk) “Tutorial on basic and advanced fluid flow modeling”, the 2010 Annual CSIM Meeting, Omni Hotel in Houston, Texas, USA, 1:15-1:45pm, January 13, 2011 (January 13-14, 2011 for the entire meeting).
- 96 (Invited) “Finite element simulation of multi-phase flow and transport in heterogeneous porous media,” Department of Mathematics, North Carolina State University, Raleigh, North Carolina, USA, 3:00-4:00pm, January 4, 2011.
- 97 (Invited) “Mathematical issues in multi-component multi-phase flow and transport in heterogeneous porous media,” Institute for Computational and Applied Mathematics, 10:00-11:00am, Xiangtan University, Hunan, China, December 22, 2010.
- 98 (Invited) “Computational issues in three-phase compositional flow in heterogeneous porous media,” Shenzhen Institute of Advanced Technology (SIAT), Chinese Academy of Sciences (CAS), Shenzhen, Guangdong, China, 2:00-3:00pm, December 20, 2010.
- 99 (Contributed, with C. Dong) “Simulation of contaminant transport in fractured porous media on triangular meshes”, The 2010 International Conference on Computational and Information Sciences (ICCIS2010), Chengdu, Sichuan, China, December 17 - 19, 2010.
- 100 (Invited) “Compositional modeling of multiphase flow in heterogeneous porous media with applications to enhanced oil recovery,” College of Chemical Engineering, Beijing University of Chemical Technology (BUCT), 15 Beisanhuandong Rd, Beijing, China, 2:00pm, November 17, 2010.
- 101 (Invited) “Iterative IMPEC and conservative finite element methods for compositional multiphase flow in porous media,” in Conference Room 337, Level 3, Building 5, The Institute of Software, Chinese Academy of Sciences (ISCAS), 4# South Fourth Street, Zhongguan Cun, Beijing, China, 10:00am November 16, 2010.
- 102 (Invited) “Do finite element methods tell us anything about finite difference methods?” AMCS (Applied Mathematics and Computational Science) Chalk Talk, Room 4102, Level 4, KAUST Bldg. 1, Thuwal, Saudi Arabia, 4:00-5:30pm, November 1, 2010.
- 103 (Invited) “Simulation of multiphase flow in heterogeneous porous media with capillarity”, the Annual CSM Industrial Affiliates Meeting, the University of Texas at Austin, Austin, Texas, USA, October 26-27, 2010.
- 104 (Invited) “Towards accurate and efficient computational modeling of compositional multiphase flow”, presented in the minisymposium of “Advances in Computational Modeling in the Geosciences” in the 2010 SIAM Annual Meeting (AN10), Pittsburgh, Pennsylvania, USA, July 12-16, 2010.
- 105 (Invited) “Adaptive discontinuous Galerkin method for contaminant transport in fractured porous media”, presented in the minisymposium of “Advances in Nonconforming Finite Element Methods” in the 2010 SIAM Annual Meeting (AN10), Pittsburgh, Pennsylvania, USA, July 12-16, 2010.
- 106 (Invited) “Frontiers and future of multiphase fluid flow modeling in oil reservoirs”, presented at the 2010 inaugural CSIM meeting, Room 5220, Level 5, KAUST Bldg. 2 (West), Thuwal, Saudi Arabia, 11:10-11:35am, May 1, 2010.
- 107 (Invited) “Finite element simulation of multiphase flow in heterogeneous porous media”, presented at Xi’an Jiao Tong University, Xi’an, China, 4:10-5:00pm, April 2, 2010.
- 108 (Invited) “Finite element simulation of multiphase flow in heterogeneous porous media”, presented at the Department of Mathematics, Room 3416, Hong Kong University of Science and Technology, Hong Kong, 4:30-5:30pm, March 30, 2010.
- 109 (Invited) “Numerical simulation of subsurface multiphase flow using locally conservative finite element methods”, presented at the Department of Mathematics, Hong Kong Baptist University, Hong Kong, 2:30 – 3:30pm, March 29, 2010.
- 110 (Invited) “Compositional multiphase flow in heterogeneous porous media”, IAMCS Workshops on Computational and Mathematical Challenges in Material Science and Engineering: Complex Fluid Dynamics, KAUST, Thuwal, Saudi Arabia, March 22 - March 25, 2010.
- 111 (Invited) “Numerical simulation of two-phase flow in heterogeneous porous media”, the 2010 InterPore Conference and Annual Meeting, Texas A&M University, College Station, Texas, USA, March 14-17, 2010.
- 112 (Invited Plenary Talk) “Latest developments and future challenges in subsurface fluid flow modeling”, the 2009 Annual UTAM Meeting, Sutton Building, University of Utah, Salt Lake City, Utah, USA, 2:05-2:40pm, January 7, 2010.

- 113 (Invited) “Computational modeling of fluid flow through porous media and applications to oil reservoirs”, the KAUST Computational Geoscience Seminar, Building 1, Room 3119, KAUST, Thuwal, Saudi Arabia, 4:00pm, November 17, 2009.
- 114 (Invited) “Compositional modeling of multiphase flow in heterogeneous porous media using higher order finite element methods”, presented in School of Petroleum Engineering, China University of Petroleum-Beijing (CUPB), Beijing, China, 10:00am, November 6, 2009.
- 115 (Invited) “Higher order finite element methods for multiphase flow in porous media”, presented in Department of Mathematical Sciences, Tsinghua University, Beijing, China, 3:00pm, November 5, 2009.
- 116 (Invited) “Mathematics in energy and environment: simulation of multiphase flow and transport”, presented in the College of Science at Guizhou University, Guiyang, China, 3:00pm, November 2, 2009.
- 117 (Invited, with Abbas Firoozabadi) “Compositional modeling in three-phase flow for CO₂ and other fluid injections using higher-order finite element methods”, presented in the SPE Annual Technical Conference and Exhibition, New Orleans, Louisiana, October 6, 2009.
- 118 (Invited) “Discontinuous Galerkin and mixed finite element methods for multiphase flow modeling”, presented in the KAUST – Saudi Aramco ECC and IT Exploratory Collaboration Workshop, KAUST, Thuwal, Saudi Arabia, 11:10am, September 14, 2009.
- 119 (Invited) “Compositional three-phase flow: numerical modeling using combined discontinuous Galerkin and mixed finite element methods”, presented at Reservoir Engineering Research Institute (RERI), Palo Alto, California, 4:00-5:30pm, May 29, 2009.
- 120 (Invited) “Higher-order discontinuous Galerkin and mixed finite element methods with nonconforming meshes for two-phase flow modeling”, presented in the 20th RERI (Reservoir Engineering Research Institute) Anniversary Workshop, Palo Alto, California, May 11-12, 2009.
- 121 (Invited) “Adaptive discontinuous Galerkin methods for single- and two-phase flow and reactive transport in porous media”, ICES seminar, ACE 2.402, Institute for Computational Engineering and Sciences, The University of Texas at Austin, 10:00-11:00am, May 8, 2009.
- 122 (Invited) “Mixed finite element and discontinuous Galerkin methods for two-phase flow in porous media”, presented in the minisymposium of “Computational issues in porous media flows”, the 33rd SIAM Southeastern-Atlantic Section Annual Meeting, University of South Carolina, Columbia, South Carolina, 10:30am - 10:55am, April 4, 2009.
- 123 (Invited) “Numerical methods for flow and transport in porous media”, the Research Introductory Seminar to First-Year Graduate Students in the Department of Mathematical Sciences, Clemson University, South Carolina, 4:30pm, March 24, 2009.
- 124 (Invited) “Adaptive and locally conservative numerical methods for flow and transport in porous media”, presented in the minisymposium of “Numerical Simulations of Flows in Porous Media”, SIAM Conference on Computational Science and Engineering (CSE09), Miami Hilton Hotel, Miami, Florida, 5:30-5:55, March 2, 2009.
- 125 (Invited) “In silico modeling of angiogenesis”, Presented in the "Cells and Materials: At the Interface between Mathematics, Biology and Engineering" Reunion conference II at Lake Arrowhead, California, 10:40-11:10pm, December 9, 2008.
- 126 (Invited) “Adaptive discontinuous Galerkin methods for two-phase flow in porous media”, the Annual CSM Industrial Affiliates Meeting, ACES Building Room 6.304, the University of Texas at Austin, Austin, Texas, 2:00-2:30pm, October 29, 2008.
- 127 (Invited; presented together with Delphine Dean and Meaghan Riemer) “Modeling of growth phenomena – From angiogenesis to neurite outgrowth”, the MACOBE (Mathematics Computing Biology Engineering) Creative Inquiry seminar, Department of Bioengineering and Department of Mathematical Sciences, Edwards 308, Clemson University, Clemson, South Carolina, 3:35-4:25pm, September 3, 2008.
- 128 (Invited) “Multiscale, adaptive and conservative finite element methods for flow and transport in porous media”, Reservoir Simulation Development Group, ConocoPhillips Company, Houston, Texas, 10:30-11:30am, August 15, 2008.
- 129 (Invited) “Conservative and adaptive Galerkin methods for coupling flow and transport in porous media”, the 32nd SIAM Southeastern-Atlantic Section Conference (SIAM-SEAS 2008), University of Central Florida, Orlando, Florida, 4-4:30pm, March 14, 2008.
- 130 (Invited) “Numerical methods for modeling porous media phenomena”, the Research Introductory Seminar to First-Year Graduate Students in the Department of Mathematical Sciences, Clemson University, South Carolina, 4:00pm, January 29, 2008.

- 131 (Invited) “A locally conservative Galerkin method based on space enrichment”, Computational Mathematics Seminar, Department of Mathematical Sciences, Clemson University, Clemson, South Carolina, 3:30-4:30pm, November 13, 2007.
- 132 (Invited) “Numerical modeling of tissue angiogenesis”, the Creative Inquiry Project Seminar of "Integrating Mathematical and Computational Science into Bioengineering Modeling and Design Problems", Department of Bioengineering and Department of Mathematical Sciences, Clemson University, Clemson, South Carolina, 3:35-4:25pm, November 7, 2007.
- 133 (Invited) “Locally conservative methods for computing flow and transport in porous media”, School of Petroleum Engineering, China University of Petroleum-Beijing (CUPB), Beijing, China, 10:00-11:00am, August 1, 2007.
- 134 (Invited) “Adaptive and multiscale computation for porous media phenomena”, the State Key Laboratory of Scientific and Engineering Computing (LSEC), the Chinese Academy of Sciences, Beijing, China, 4:00-5:00pm, July 27, 2007.
- 135 (Invited) “Adaptive and multiscale computation for porous media phenomena”, School of Mathematical Sciences, Peking University, Beijing, China, 2:00-3:00pm, July 25, 2007.
- 136 (Invited) “Multiscale Modeling and Computation with Applications to Biomedical and Industrial Engineering”, presented to a research group in the Department of Industrial Engineering and Management at Shanghai Jiao Tong University, Shanghai, China, 2:30-4:00pm, July 18, 2007.
- 137 (Invited) “Conservation in numerical approximations of conservation laws”, Department of Mathematics, Tianjin University of Finance and Economics, Tianjin, China, 3:00-4:00pm, July 12, 2007.
- 138 (Invited) “Discontinuous Galerkin methods with applications to transport phenomena simulation in chemical engineering”, School of Chemical Engineering, Tianjin University, Tianjin, China, 10:00-11:00am, July 5, 2007.
- 139 (Contributed) “Adaptive and multiscale high-order discontinuous Galerkin methods for modeling subsurface flow and transport”, the International Conference on Spectral and High Order Methods (ICOSAHOM07), Beijing, China, June 18-22, 2007.
- 140 (Invited) “Multiscale discontinuous Galerkin methods for modeling flow and transport in porous media”, the 4th International Workshop on Simulation of Multiphysics Multiscale Systems, within the International Conference on Computational Science, Beijing, China, May 27-30, 2007.
- 141 (Invited) “Conservative post-processing of velocity in porous media”, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Santa Fe, New Mexico, 10:20-10:45am, March 21, 2007.
- 142 (Invited) “Adaptive and multiscale discontinuous Galerkin methods for flow and transport in porous media”, Fluid Mechanics Seminar, Department of Civil Engineering, Clemson University, South Carolina, 3:00-3:50pm, March 2, 2007.
- 143 (Invited) “Finite element methods for modeling porous media phenomena”, the Research Introductory Seminar to First-Year Graduate Students in the Department of Mathematical Sciences, Clemson University, South Carolina, 4:00pm, February 6, 2007.
- 144 (Invited) “Local conservation in numerical solutions and its recovery”, Department of Applied Mathematics, Providence University, Taichung, Taiwan, 4:10-5:00pm, January 2, 2007.
- 145 (Invited) “Discontinuous Galerkin methods for flow and transport problems”, Series talks, Taiwan National Center for Theoretical Sciences, Mathematics Division, Taipei Office, presented at Room 308, New Mathematics Building, National Taiwan University, Taipei, 10:20-11:50am, December 26, 2006 and 10:20-11:50am, January 2, 2007.
- 146 (Contributed) “Multiscale discontinuous Galerkin methods for simulating single-phase and multi-phase flow in porous media”, the AIChE 2006 Annual Meeting, San Francisco, California, November 17, 2006.
- 147 (Invited) “Adaptive discontinuous Galerkin methods for reactive transport problems”, Applied Math Seminar, Department of Mathematics, Colorado State University, Fort Collins, Colorado, 10:00-10:50am, November 7, 2006.
- 148 (Invited) “Local conservation in numerical solutions and its recovery”, Computational Mathematics Seminar, Department of Mathematical Sciences, Clemson University, South Carolina, 1:25-2:15pm, November 1, 2006.
- 149 (Invited) “Iterative DG for air-water system”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 16-17, 2006.

- 150 (Co-author, with A. A. Rodriguez and others) “Upscaling of hydraulic properties of fractured porous media: Full permeability tensor and continuum scale simulations”, the Session of “Reservoir Simulation, Modeling, and Characterization II”, the 2006 SPE Symposium on Improved Oil Recovery, Tulsa, Oklahoma, 3:00-3:30pm, April 25, 2006.
- 151 (Invited) “A deterministic multiscale modeling approach for computational simulation of angiogenesis”, Department of Biomedical Informatics, Ohio State University Medical Center, 1:30-2:30pm, April 6, 2006.
- 152 (Invited) “Adaptive discontinuous Galerkin methods for porous media phenomena”, Department of Mathematics, National University of Singapore, 3:00-4:00pm, March 27, 2006.
- 153 (Invited) “Adaptive discontinuous Galerkin methods for reactive transport problems”, Department of Mathematics and Statistics, University of Maryland, Baltimore County, 11:00am-12:00, January 27, 2006.
- 154 (Invited) “Adaptive discontinuous Galerkin methods for reactive transport problems”, Department of Mathematical Sciences, Clemson University, South Carolina, 4:00-5:00pm, January 23, 2006.
- 155 (Invited) “Algorithms for modeling flow and reactive transport in porous media”, the MAA Invited Paper Session on Environmental Modeling, 2006 Joint Mathematics Meetings, San Antonio, Texas, January 12-15, 2006.
- 156 (Invited) “Modeling flow and transport in porous media: adaptive discontinuous Galerkin and streamline methods”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 26-27, 2005.
- 157 (Co-author, with C. W. Patrick Jr., M. Obeyesekere and M. F. Wheeler) “A 2-dimensional mathematical model of angiogenesis”, the 8th TESI (Tissue Engineering Society International) Annual Meeting, Shanghai, China, October 22-25, 2005. [Abstract published in *Tissue Engineering*, 12(4):985, 2006]
- 158 (Invited) “Recovery of local mass conservation and higher order compatibility for continuous Galerkin methods”, the 8th U.S. National Congress on Computational Mechanics (USNCCM8), Austin, Texas, July 24-28, 2005.
- 159 (Invited) “Anisotropic and isotropic mesh adaptation for primal discontinuous Galerkin methods”, the 8th U.S. National Congress on Computational Mechanics (USNCCM8), Austin, Texas, July 24-28, 2005.
- 160 (Invited) “Adaptive discontinuous Galerkin methods for coupled diffusion- and advection-dominated transport phenomena”, the 3rd International Conference on Computing, Communication and Control Technologies (CCCT '05), Austin, Texas, July 24-27, 2005.
- 161 (Invited) “Discontinuous Galerkin and mixed finite element methods for biochemical transport problems”, the International Conference on Hot Topics in Current Applied and Industrial Mathematics, Guiyang, Guizhou, China, July 13-16, 2005.
- 162 (Co-author, with C. W. Patrick Jr., M. Obeyesekere and M. F. Wheeler) “Multiscale *in silico* modeling of angiogenesis”, 2005 Summer Bioengineering Conference, Vail, Colorado, June 22-26, 2005.
- 163 (Invited) “Multiscale angiogenesis modeling”, the 2nd International Workshop on Simulation of Multiphysics Multiscale Systems (in conjunction with the ICCS'2005 conference), Atlanta, Georgia, May 22-25, 2005.
- 164 (Contributed) “*A priori* and *a posteriori* error estimates for discontinuous Galerkin methods applied to time-dependent problems”, Finite Element Rodeo, Dallas, Texas, March 4-5, 2005.
- 165 (Co-author, with M. F. Wheeler, M. Obeyesekere and C. W. Patrick Jr.) “Multiscale Angiogenesis Modeling”, the 22nd Annual Houston Conference on Biomedical Engineering Research, the Hilton Hotel and Convention Center, the University of Houston, Houston, Texas, February 10-11, 2005.
- 166 (Invited) “Adaptive discontinuous Galerkin methods for reactive transport problems”, the Applied Math - PDE seminar at UW, 114 Ingraham Building, University of Wisconsin-Madison, February 1, 2005.
- 167 (Invited) “*In silico* multiscale modeling of angiogenesis”, 1441 Genetics/Biotech Building, University of Wisconsin-Madison, January 31, 2005.
- 168 (Invited) “Dynamics of micro-vasculature”, the Annual Biomedical Engineering Conference sponsored by UT Center for Biomedical Engineering and UT Department of Biomedical Engineering, Houston, Texas, December 6-7, 2004.
- 169 (Contributed) “A dynamic, adaptive, locally conservative and nonconforming solution strategy for transport phenomena in chemical engineering”, the AIChE 2004 Annual Meeting, Austin, Texas, November 7-12, 2004.
- 170 (Contributed) “Deterministic simulation of growth factor-induced angiogenesis”, the AIChE 2004 Annual Meeting, Austin, Texas, November 7-12, 2004.

- 171 (Invited) “An iterative velocity postprocessing scheme for the compatibility with streamline tracing”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 26-27, 2004.
- 172 (Invited) “Mesh adaptation strategies for discontinuous Galerkin methods applied to reactive transport problems”, the 2nd International Conference on Computing, Communication and Control Technologies (CCCT '04), Austin, Texas, August 14-17, 2004.
- 173 (Invited) “Nonlinear behavior of capillary formation in a deterministic angiogenesis model”, presented in the special session of “Nonlinear dynamics in biological problems”, the 4th World Congress of Nonlinear Analysts, Orlando, Florida, June 30 - July 7, 2004.
- 174 (Invited) “*A posteriori* error estimates for reactive transport”, Joint PET/ARL/AHPCRC Workshop on Discontinuous Galerkin Methods for Computational Mechanics, Army High Performance Computing Research Center (AHPCRC), University of Minnesota, Minneapolis, Minnesota, May 10, 2004.
- 175 (Co-author, with M. F. Wheeler and C. Dawson) “Mathematical issues in multiphysics couplings”, the 8th Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, March 28 – April 2, 2004.
- 176 (Contributed) “Projections of velocity for the compatibility with transport”, Finite Element Rodeo, Austin, Texas, March 5-6, 2004.
- 177 (Invited) “Primal discontinuous Galerkin methods for reactive transport in porous media”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 21-22, 2003.
- 178 (Co-author, with M. F. Wheeler) “Discontinuous Galerkin methods for coupled flow and reactive transport problems”, ADAPT '03: Conference on Adaptive Methods for Partial Differential Equations and Large-Scale Computation, Rensselaer Polytechnic Institute, Troy, New York, October 11-12, 2003.
- 179 (Contributed) “Discontinuous Galerkin methods for modeling flow and reactive transport”, the 7th U.S. National Congress on Computational Mechanics (USNCCM7), Albuquerque, New Mexico, July 28-30, 2003.
- 180 (Invited) “Numerical computation of ANDRA-Couplex1 test case using locally conservative methods”, SIAM Conference on Mathematical and Computational Issues in the Geosciences (GS03), Austin, Texas, March 17-20, 2003.
- 181 (Invited) “Discontinuous Galerkin Method for Reactive Transport”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 24, 2002.
- 182 (Invited) “Combining mixed finite elements for flow and discontinuous Galerkin for transport in modeling miscible displacement in porous media”, Minisymposium on Discontinuous Galerkin Methods for Partial Differential Equations, SIAM 50th Anniversary Meeting, Philadelphia, July 8-12, 2002.
- 183 (Co-author, with M. Peszynska) “Reactive transport model coupled to multiphase flow models”, International Conference on Computational Methods in Water Resources XIV, Delft, June 2002.
- 184 (Co-author, with M. F. Wheeler et al.) “Discontinuous Galerkin method for modeling flow and reactive transport in porous media”, Le 34^{ème} Congrès National d'Analyse Numérique (CANUM 2002), Anglet, France, May 27-31, 2002.
- 185 (Co-author, with M. F. Wheeler et al.) “Simulation of multi-species multi-physics phenomena in porous media using a non-conforming and locally conservative method”, International Conference on Multifield Problems, Stuttgart, Germany, April 6-10, 2002.
- 186 (Co-author, with M. Peszynska et al.) “Coupling of models for multiphase flow and transport in porous media with multiple scales”, IMA Minisymposium: Numerical Methods in the Geosciences, March 13-15, 2002.
- 187 (Invited) “Reactive transport model in IPARS and its environmental applications”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 31, 2001.
- 188 (Co-author, with B. Riviere and M. F. Wheeler) “A combined mixed finite element and discontinuous Galerkin method for miscible displacement problem in porous media”, International Conference on Computational and Applied PDEs, Zhangjiajie National Park of China, July 1-7, 2001.
- 189 (Invited) “Multiphase reactive models in IPARS”, the Annual CSM Industrial Affiliates Meeting, Austin, Texas, October 11-12, 2000.
- 190 (Contributed) “The liquid mixing behavior in a column containing corrugated structured packing”, the 2nd China-US Conference in Chemical Engineering, Beijing, China, May 1997.
- 191 (Contributed) “Liquid distribution in a large scale column containing corrugated plate packing”, the 8th National Conference of Chemical Engineering, Tianjin, China, October 1996.

- 192 (Contributed) “The distillation simulation in a large scale column containing structured packing with three dimensional non-equilibrium mixing-pool model”, the 8th National Conference of Chemical Engineering, Tianjin, China, October 1996.
- 193 (Co-author, with Z. Jiang) “Simulation of multistage fluidized bed adsorption process by Monte Carlo method”, the International Conference of Reactive Polymers, Xi’an, China, 1994.

OTHER EXPERIENCES

Member of

- AMS (American Mathematical Society)
- SIAM (Society for Industrial and Applied Mathematics)
- SPE (Society of Petroleum Engineers)
- USACM (United States Association of Computational Mechanics)

University Service

- Judge, The 2013 KAUST Graduate Student and Postdoc Poster Competition (In the 4th WEP held in KAUST, January 12 to January 30, 2013).
- Member, Program Committee for the 4th Winter Enrichment Program (WEP) (The 4th WEP held in KAUST, January 12 to January 30, 2013).
- Member, Visiting Student Task Force (a university level committee), KAUST, September 2011 – December 2011.
- Faculty advisor, the SPE student chapter at KAUST, KAUST, February 2011 – Present.
- Member, Faculty Hiring Committee, Earth Science and Engineering Program, KAUST, November 2012 – November 2013.
- Member, Faculty Hiring Committee of Fluid Track, Earth Science and Engineering Program, KAUST, November 2016 – Present.
- Member, Faculty Search and Selection Committee, Strategic Initiative for Extreme Simulation, KAUST, November 2012 – November 2013.
- Chair, Faculty committee for establishing the SPE student chapter at KAUST (Committee consisting of Professors V. Calo, I. Hoteit, S. Sun and Y. Wu), KAUST, September 2010 – January 2011.
- Member, Faculty Hiring Committee, Applied Mathematics Program, KAUST, September 2010 – August 2011.
- Member, Faculty Hiring Committee, Earth Science and Engineering Program, KAUST, December 2009 – November 2011.
- Member, Graduate Student Admission Committee, Earth Science and Engineering Program, KAUST, September 2014 – Present.
- Chair, Graduate Student Admission Committee, Earth Science and Engineering Program, KAUST, September 2013 – September 2014, and September 2016 – Present.
- Member, Graduate Student Admission Committee, Earth Science and Engineering Program, KAUST, September 2009 – November 2010, September 2011 – November 2012, and September 2013 – Present.
- Member, Graduate Student Admission Committee, Applied Mathematics Program, KAUST, September 2009 – September 2010.
- Member, The Graduate Affairs Committee of Department of Mathematical Sciences, Clemson University, August 2008 – August 2009.
- Member, The Research Committee of Department of Mathematical Sciences, Clemson University, August 2006 – August 2008.

Referee for Journals and Symposia

- 1) *Acta Applicanda Mathematicae*, since 2014
- 2) *Advances in Applied Mathematics and Mechanics (AAMM)*, since 2010
- 3) *Advances in Computational Mathematics*, since 2012
- 4) *Advances in Mechanical Engineering*, since 2011

- 5) *Advances in Numerical Analysis*, since 2014
- 6) *Advances in Water Resources*, since 2009
- 7) *Annals of Biomedical Engineering*, since 2006
- 8) *Applied Mathematical Modelling*, since 2007
- 9) *Applied Mathematics and Computation*, since 2009
- 10) *Applied Mathematics Letters*, since 2012
- 11) *Central European Journal of Mathematics*, since 2011
- 12) *Communications in Computational Physics*, since 2007
- 13) *Communications in Numerical Methods in Engineering*, since 2005
- 14) *Computational and Mathematical Organization Theory (CMOT)*, since 2011
- 15) *Computational Geosciences*, since 2007
- 16) *Computer Methods in Applied Mechanics and Engineering*, since 2004
- 17) *Computers and Fluids*, since 2010
- 18) *Computers and Geotechnics*, since 2007
- 19) *Computers and Mathematics with Applications*, since 2005
- 20) *Discrete and Continuous Dynamical System B. Centered around dynamics (DCDS-B)*, since 2008
- 21) *Documenta Mathematica (a German Journal)*, since 2008
- 22) *Engineering Fracture Mechanics*, since 2013
- 23) *Heat Transfer Engineering*, since 2011
- 24) *IAENG International Journal of Applied Mathematics (IAENG-IJAM)*, since 2014
- 25) *IEEE SMC-C Trans. (Transactions on Systems, Man, and Cybernetics--Part C: Applications and Reviews)*, since 2010
- 26) *IMA Journal of Numerical Analysis*, since 2010
- 27) *ISRN Applied Mathematics*, since 2011
- 28) *International Journal for Multiscale Computational Engineering*, since 2007
- 29) *International Journal for Numerical Methods in Engineering*, since 2010
- 30) *International Journal for Numerical Methods in Biomedical Engineering*, since 2011
- 31) *International Journal of Control*, since 2009
- 32) *International Journal of Modelling and Simulation*, since 2007
- 33) *International Journal of Numerical Analysis and Modeling (IJNAM)*, since 2010
- 34) *International Journal of Numerical Analysis & Modeling, Series B (IJNAMB)*, since 2010
- 35) *International Journal of Production Research (IJPR)*, since 2010
- 36) *International Journal of the Physical Sciences*, since 2010
- 37) *Inverse Problems*, since 2009
- 38) *Journal of Applied Mathematics*, since 2010
- 39) *Journal of Canadian Petroleum Technology*, since 2010
- 40) *Journal of Computational and Applied Mathematics*, since 2007
- 41) *Journal of Computational Mathematics*, since 2007
- 42) *Journal of Computational Physics*, since 2009
- 43) *Journal of Engineering Mathematics*, since 2006
- 44) *Journal of Hydrology*, since 2012
- 45) *Journal of Inequalities and Applications*, since 2009
- 46) *Journal of Mathematical Analysis and Applications (JMAA)*, since 2015
- 47) *Journal of Porous Media*, since 2008
- 48) *Journal on Scientific Computing*, since 2008
- 49) *Journal of Systemics, Cybernetics and Informatics*, since 2006
- 50) *Journal of the Taiwan Institute of Chemical Engineers*, since 2008
- 51) *Kuwait Journal of Science*, since 2012
- 52) *Mathematical Biosciences*, since 2009
- 53) *Mathematical Biosciences and Engineering (MBE Journal)*, since 2006
- 54) *Mathematical Problems in Engineering*, since 2011
- 55) *Methods of Mathematical Modeling and Applications (M3AS)*, since 2012
- 56) *Nonlinear Analysis Series A: Theory, Methods & Applications*, since 2009
- 57) *Numerical Mathematics: Theory, Methods and Applications*, since 2010
- 58) *Numerical Methods for Partial Differential Equations*, since 2007
- 59) *Numerische Mathematik*, since 2007

- 60) *Petroleum Science*, since 2015
- 61) *Physica Scripta*, since 2014
- 62) *Progress in Computational Fluid Dynamics (PCFD)*, since 2013
- 63) *Scientific Journals International*, since 2007
- 64) *SPE Journal*, since 2013
- 65) *Special Topics & Reviews in Porous Media*, since 2010
- 66) *SIAM Journal on Applied Mathematics*, since 2012
- 67) *SIAM Journal on Multiscale Modeling and Simulation*, since 2005
- 68) *SIAM Journal on Numerical Analysis*, since 2006
- 69) *SIAM Journal on Scientific Computing*, since 2004
- 70) *Water Resources Research*, since 2005
- 71) *Water Research*, since 2010
- 72) *The International Conference on Computational Science 2007 (ICCS 2007)*, 2007
- 73) *The International Conference on Computational Science 2011 (ICCS 2011)*, 2011
- 74) *The International Conference on Computational Science 2012 (ICCS 2012)*, 2012
- 75) *The International Conference on Computational Science 2013 (ICCS 2013)*, 2013
- 76) *The International Conference on Computational Science 2015 (ICCS 2015)*, 2015
- 77) *The 3rd International Conference on Computing, Communications & Control Technologies*, 2005
- 78) *The 16th International Conference on Information Systems Analysis & Synthesis (ISAS 2010)*, 2010
- 79) *The Conference on Hot Topics in Current Applied and Industrial Mathematics at Guiyang*, 2005
- 80) *The 15th International Symposium on Domain Decomposition Methods*, 2003

Referee for Funding Agencies

- 1) *Georgia National Science Foundation*, since 2007
- 2) *King Abdulaziz City for Science and Technology (KACST)*, Saudi Arabia, since 2013
- 3) *CMG Reservoir Simulation Foundation (Foundation CMG)*, Canada, since 2013
- 4) *King Fahd University of Petroleum & Minerals (KFUPM)*, Saudi Arabia, since 2016

Reviewer for

Mathematical Reviews, since 2006

Computers

Profound knowledge of R, Python, MATLAB, Java, C, C++ and FORTRAN
Knowledge of UNIX, Mac OS X and Windows operating systems
Rich experience in object-oriented programming and parallel computing
Good knowledge of LaTeX, Perl, HTML, JavaScript
Experience of Maple, Mathematica, Scilab, Tecplot, LyX, MS-Office

Languages

Native speaker of Chinese (speaking fluent Mandarin and several other Chinese dialects)
Good knowledge of English (speaking fluent American English)
Elementary Japanese
Elementary Arabic