# Kehua You

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## **RESEARCH INTERESTS**

Methane Hydrate, Hydrogeology, Subsurface Fluid Flow and Transport, Numerical and Analytical Modeling

## **EDUCATION**

- Ph.D. 2013 Geology, Texas A&M University, College Station, Texas, USA

  Dissertation: Influence of atmospheric pressure and water table fluctuations on gas phase flow and transport of volatile organic compounds (VOCs) in unsaturated zone
- B.E. 2008 Environmental Science, University of Science and Technology of China, Hefei, China *Thesis: Study of Antimony Pollution in NY-ALESUND, Svalbard archipelago, Arctic*

#### PROFESSIONAL APPOINTMENTS

2015- present	Research Associate, Institute for Geophysics, University of Texas at Austin, Texas, USA
2013-2015	Postdoctoral Fellow, Institute for Geophysics, University of Texas at Austin, Texas, USA
2011	Researcher, Idaho National Laboratory, Idaho Falls, Idaho, USA
2007-2008	Research Assistant, Institute of Polar Environment, University of Science and Technology
	of China, Hefei, China

## **AWARDS & HONORS**

#### Awards:

Research awards in 5 <sup>th</sup> Annual Texas A&M Geology & Geophysics Research Symposium
Research awards in 4 <sup>th</sup> Annual Texas A&M Geology and Geophysics Research Symposium
Research awards in 3 <sup>rd</sup> Annual Texas A&M Geology and Geophysics Research Symposium
"Best Graduate Student", University of Science and Technology of China
"Excellent Undergraduate Research Program", University of Science and Technology of China

# Fellowships:

2012-2013	GEPL GRAD Fellowships, Texas A&M University (~\$30,000)
2011-2012	Chevron Fellowships, Texas A&M University (~\$30,000)
2010-2011	ConocoPhillips Fellowships, Texas A&M University (~\$30,000)
2009-2010	Aramco Fellowships, Texas A&M University (~\$30,000)
2008-2009	ConocoPhillips Fellowships, Texas A&M University (~\$30,000)

Scholarships:	
2011-2012	Doris & Joe P. Watson 42 Endowed Graduate Scholarship, Texas A&M University
	(\$5,000)
2008-2009	Incentive Scholarship, Texas A&M University (\$5,000)
2004-2008	Natural Inspiring Scholarship, University of Science and Technology of China, China,
	(~\$800)
2005-2006	"Huang Mao Tong" Special Scholarship, University of Science and Technology of China,
	China (~\$400)
2004-2005	Outstanding Student Scholarship (~\$200)

#### **PUBLICATIONS**

\* Student \*\*Postdoctoral fellow

#### Peer-reviewed Journal Publications:

- 1) \*Meyer, D., P. B. Flemings, **K. You,** and D. DiCarlo (2020), Gas flow by invasion percolation through the hydrate stability zone, Geophysical Research Letter, In Press.
- 2) Flemings, P.B., S.C. Phillips, R. Boswell, ... and **K. You** (2020), Pressure coring a Gulf of Mexico deepwater turbidite gas hydrate reservoir: initial results from the UT-GOM2-1 hydrate pressure coring expedition, AAPG Bulletin, Accepted pending revisions.
- 3) \*\*Fang, Y., P.B. Flemings, H. Daigle, S.C. Phillips, P.K. Meazell, and **K. You** (2020), Petrophysical properties of the GC955 hydrate reservoir inferred from reconstituted sediments: Implications for Hydrate Formation and Production, AAPG Bulletin, In Press.
- 4) You K., P.B. Flemings, A. Malinverno, T.S. Collett, and K. Darnell. (2019), Mechanisms of methane hydrate formation in geological systems, Reviews of Geophysics, 57.
- 5) \*Wei, L., A. Cook, H. Daigle, A. Malinverno, M. Nole, and **K. You** (2019), Factors controlling short-range methane migration of gas hydrate accumulations in thin coarse-grained layers, Geochemistry, Geophysics, Geosystems, 20, 3985-4000.
- 6) \*\*Phillips, S.C., P.B. Flemings, **K. You**, D.W. Meyer, and T. Dong (2019), Investigation of in situ salinity and methane hydrate dissociation in coarse-grained sediments by slow, stepwise depressurization, Marine and Petroleum Geology, 109, 128-144.
- 7) You, K. and P. B. Flemings (2018), Methane hydrate formation in thick sandstones by free gas flow, Journal of Geophysical Research: Solid Earth, 123.
- 8) \*Meyer, D.W., P. B. Flemings, D. DiCarlo, **K. You**, S. C. Phillips and T. J. Kneafsey (2018), Experimental investigation of gas flow and hydrate formation within the hydrate stability zone, Journal of Geophysical Research: Solid Earth, 123.
- 9) You, K. and P. B. Flemings (2017), Methane hydrate formation in thick sand reservoirs: 1. Short-range methane diffusion, Marine and Petroleum Geology, 89,428-442.
- 10) **You, K.**, D. DiCarlo and P. B. Flemings (2016), Impact of gravity on hydrate saturation in gas-rich environments, Water Resources Research, 52, 1265-1285.
- 11) **You, K.**, D. DiCarlo and P. B. Flemings (2015), Quantifying hydrate solidification front advancing using method of characteristics, Journal of Geophysical Research: Solid Earth, 120, 6681-6697.
- 12) You, K., T. Kneafsey, P. B. Flemings, S. Bryant, and P. Polito (2015), Salinity-buffered methane

- hydrate formation and dissociation in gas-rich systems, Journal of Geophysical Research: Solid Earth, 120 (2), 643-661.
- 13) **You, K.**, and H. Zhan (2013), New solutions for solute transport in a finite column with distance dependent dispersivities and time-dependent sources, Journal of Hydrology, 487, 87-97.
- 14) **You, K.**, and H. Zhan (2013), Comparisons of diffusive and advective fluxes of gas phase volatile organic compounds (VOCs) in unsaturated zones under natural conditions, Advances in Water Resources, 52, 221-231.
- 15) **You, K.**, and H. Zhan (2012), Can water table and atmospheric pressure fluctuations be neglected in soil vapor extraction?, Advances in Water Resources, 35, 41-54.
- 16) \*Li, J., **K. You**, H. Zhan, and G. Huang (2012), Analytical solution to airflow of barometric pumping in layered unsaturated zone porous media", Transport in Porous Media, 93(3), 461-474.
- 17) \*Li, J., H. Zhan, G. Huang, and **K. You** (**2012**), "Determining air permeability in reclaimed coastal land based on tidal fluctuations", *Environmental Earth Sciences*, *66*(4), 1259-1268.
- 18) **You, K.**, H. Zhan, and J. Li (2011), Analysis of models for induced gas flow in unsaturated zone, Water Resource Research, 47, W04515.
- 19) **You, K.**, H. Zhan, and J. Li (2011), Gas flow to a barometric pumping well in a multilayered unsaturated zone, Water Resources Research, 47, W05522.
- 20) **You, K.**, H. Zhan, and J. Li (2010), A new solution and data analysis for gas flow to a barometric pumping well, Advances in Water Resources, 33(12), 1444-1455.
- 21) \*Li, J., H. Zhan, G. Huang, and **K. You** (**2010**), Tidal induced airflow in a two-layered coastal land with atmospheric pressure fluctuations, *Advances in Water Resources*, 34, 649-658.
- 22) Sun, L., L. Yuan, N. Jia, **K. You**, X. Wang, and Y. Wang (**2010**), Sb pollution in the soil, moss and sediments of Ny-Alesund, Svalbard, Arctic, *Sciencepaper Online*.
- 23) \*Xu, L., L. Sun, **K. You**, J. Wang, and Y. Wang (**2010**), Geochemical characteristics of Pb in cultural layers of Yuchisi Site and source tracing of primitive metallurgy in China, *Acta Pedologica Sinica*, *47*(2), 193-205.
- 24) \*Xu, L., L. Sun, J. Zhang, R. Zhu, **K. You**, and J. Wang (**2008**), 2500 BC: the beginning of chalcolithic period in China recorded by Hg, *Quaternary Research*, *28*(6), 1070-1080.

#### Conference Publications:

- 25) **You, K.**, and P. B. Flemings (2017), Methane hydrate formation in thick sand reservoirs: Long-range gas transport or short-range methane diffusion?, ICGH9, Denvor, Colorado, USA.
- 26) \*Meyer, D. W., **K. You**, S. Phillips, Flemings P.B., DiCarlo D. and Kneafsey, T. (2017), Methane hydrate formation in coarse-grained, brine-saturated sample through the induction of a propagating gas front, ICGH9, Denvor, Colorado, USA.
- 27) \*\*Phillips, S. C., **K. You**, P.B. Flemings, D.W. Meyer and T. Dong (2017), Dissociation of laboratory-synthesized methane hydrate in coarse-grained sediments by slow depressurization, ICGH9, Denvor, Colorado, USA.
- 28) \*Wei, L., A.E. Cook, A. Malinverno, H. Daigle, M. Nole, R. Andris, **K. You** and J. M. Frederick (2017), Methane hydrate formation in coarse-grained, brine-saturated sample through the induction of a propagating gas front, ICGH9, Denvor, Colorado, USA.
- 29) Flemings, P. B. et al. (2017), GOM2: Prospecting, drilling and sampling coarse-grained hydrate

reservoirs in the Deepwater Gulf of Mexico, ICGH9, Denvor, Colorado, USA.

#### **RESEARCH GRANTS**

*Co-Investigator*, "Characterization and Modeling of Methane Hydrate Reservoirs in the Gulf of Mexico", ExxonMobil, Mar. 2017 – Feb., 2020, \$239,703 of \$905,681.

*Participant as Research Associate*, "Deepwater methane hydrate characterization in the Gulf of Mexico: scientific assessment and production potential", DOE, Oct. 2014-Sep. 2021, \$93,978,392.

Participant as Postdoctoral fellow, "Controls on methane expulsion during melting of natural gas hydrate systems", DOE, Oct. 2012-Mar. 2015, \$1,170,806.

#### **PRESENTATIONS**

# Invited Talks:

Spring, 2020	Coupled Multiphase Flow and Reactive Transport Processes in Gas Hydrate Systems, Gordon Research Conference, Galveston, Texas
Spring, 2019	Mechanisms of Methane Hydrate Formation in Geological Systems, Chapman Colloquium Series, University of New Hampshire.
Fall, 2018	Methane Recycling through Burial of Methane Hydrate-Bearing Sediments, UTIG Brownbag Seminar, the University of Texas at Austin.
Fall, 2018	Conceptual and Quantitative Models of Hydrate Formation by Microbial Biogenesis at GC-955, GOM2 Workshop, Ohio State University.
Spring, 2017	Developing Testable Hypotheses for Drilling Expedition of Methane Hydrate-Bearing Thick Sand Reservoirs in Gulf of Mexico, Departmental seminar, Texas A&M University.
Spring 2016	Methane Hydrate Formation by Long Range Gas Transport, UTIG seminar, the University of Texas at Austin.
Spring 2015	Hydrate Formation in Gas-Rich Environments, Hydro Brownbag seminar, the University of Texas at Austin.
Spring 2015	Hydrate Formation in Gas-Rich Environments, UTIG Brownbag Seminar, the University of Texas at Austin.
Spring 2013	Impact of Atmospheric Pressure and Water Table Fluctuations on Gas Phase Flow and Transport of Volatile Organic Compounds (VOCs) in Unsaturated Zones, Hydro Brownbag Seminar, the University of Texas at Austin.

#### Scientific Presentations:

- 1) **You, K.**, M. Santra, L. Summa, and P.B. Flemings, 2020 (<u>ORAL</u>), Impact of focused free gas flow and microbial methanogenesis kinetics on the formation and evolution of geological gas hydrate system, Abstract to be presented at 10<sup>th</sup> International Conference on Gas Hydrates (ICGH10), 21-26 June, Singapore
- 2) **You, K.**, M. Santra, L. Summa, and P.B. Flemings, 2020 (<u>ORAL</u>), Impact of coupled free gas flow and microbial methanogenesis on the formation and evolution of concentrated hydrate deposits, Abstract to be presented at AAPG Annual Convention & Exhibition, 7-10 June, Houston, TX.

- 3) Santa, M., **K. You**, L. Summa, and P.B. Flemings, 2020 (<u>ORAL</u>), Gas hydrate in a fault-compartmentalized anticline and the role of seal, Green Canyon, Abyssal Northern Gulf of Mexico, Abstract to be presented at AAPG Annual Convention & Exhibition, 7-10 June, Houston, TX.
- 4) Fang, Y., P.B. Flemings, H. Daigle, S. Phillips, K. Meazell and **K. You** (<u>ORAL</u>), 2019, Petrophysical properties of the GC955 Gulf of Mexico hydrate reservoir inferred from reconstituted sediments: implications for hydrate formation, Abstract presented at 2019 AGU Fall Meeting, 9-13 Dec., San Francisco.
- 5) You, K., P. B. Flemings, and M. Santra, 2018, Heterogeneous hydrate formation controlled by capillary-driven free gas flow, Abstract presented at 2018 AGU Fall Meeting, 10-14 Dec., Washington, D.C..
- 6) Meyer, D., P. B. Flemings, **K. You**, and D. DiCarlo (<u>ORAL</u>), 2018, Gas flow through the hydrate stability zone enabled by methane diffusion-limited hydrate formation, Abstract presented at 2018 AGU Fall Meeting, 10-14 Dec., Washington, D.C..
- 7) You, K., and P. B. Flemings, 2018 (<u>ORAL</u>), Heterogeneous hydrate distribution controlled by capillary pressure in sandstones composed of layers with different qualities, Abstract presented at 2018 Gordon Research Seminar, Natural Gas Hydrate Systems, Galveston, TX, 24-25 Feb.
- 8) **You, K.**, and P. B. Flemings, 2018, Heterogeneous hydrate distribution controlled by capillary pressure in sandstones composed of layers with different qualities, Abstract presented at 2018 Gordon Research Conference, Natural Gas Hydrate Systems, Galveston, TX, 26 Feb-2 March.
- 9) **You, K.**, and P. B. Flemings, 2017 (<u>ORAL</u>), Methane recycling during burial of methane hydrate-bearing sediments? Abstract presented at 2017 AGU Fall Meeting, 11-15 Dec., New Orleans, LA, USA.
- 10) **You, K.**, and P. B. Flemings, 2017 (<u>ORAL</u>), Methane recycling during burial of methane hydrate-bearing sediments? Abstract presented at 25<sup>th</sup> Hubbert Quorum, 10 Dec., New Orleans, LA, USA.
- 11) **You, K.**, and P. B. Flemings, 2017 (<u>ORAL</u>), Methane hydrate formation in thick sand reservoirs: longrange gas transport or short-range methane diffusion? Abstract presented at 9<sup>th</sup> International Conference on Gas Hydrates, 25-30 June, Denver, Colorado, USA.
- 12) **You, K.**, and P. B. Flemings, 2016, Methane hydrate formation in thick sand reservoirs: long-range gas transport or short-range methane diffusion?, Abstract presented at 2016 Fall Meeting, AGU, San Francisco, 12-16 Dec.
- 13) **You, K.**, 2016 (<u>ORAL</u>), Methane hydrate formation from gas and liquid water, Thematic School on Dynamic Recrystallization, France, 6-11 Nov.
- 14) **You, K.**, P. B. Flemings, and D. Dicarlo, 2016, Quantifying hydrate formation in gas-rich environments using the method of characteristics, Abstract presented at 2016 Gordon Research Conference, Natural Gas Hydrate Systems, Galveston, TX, 28 Feb. 4 March.
- 15) **You, K.**, P. B. Flemings, and D. Dicarlo, 2016 (<u>ORAL</u>), Quantifying hydrate formation in gas-rich environments using the method of characteristics, Abstract presented at 2016 Gordon Research Seminar, Natural Gas Hydrate Systems, Galveston, TX, 26-27 Feb.
- 16) Meyer, D.W., **K. You**, S. Phillips, P. B. Flemings, D. DiCarlo, and T. Kneafsey, 2016, Methane hydrate formation in a saturated, coarse-grained sample through the induction of a propagating gas front, Abstract presented at 2016 Gordon Research Conference, Natural Gas Hydrate Systems, Galveston, TX, 28 Feb. 4 March.
- 17) Phillips, S., T. Borgfeldt, **K. You**, D. Meyer and P. B. Flemings, 2016, Dissociation of laboratory-synthesized methane hydrate by depressurization, Abstract presented at 2016 Gordon Research Conference, Natural Gas Hydrate Systems, Galveston, TX, 28 Feb. 4 March.
- 18) You, K., P. B. Flemings and D. DiCarlo, 2015, Quantifying hydrate solidification front advancing using

- method of characteristics, Abstract presented at 2015 Fall Meeting, AGU, San Francisco, 14-18 Dec.
- 19) Meyer, D., **K. You**, T. Borgfeldt, P. B. Flemings, D. DiCarlo, and T. Kneafsey, 2015, Methane hydrate formation in a saturated, coarse-grained sample through the Induction of a propagating gas front, Abstract presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- 20) Borgfeldt, T., P. B. Flemings, D. Meyer, and **K. You**, 2015, Experimental dissociation of methane hydrates through depressurization, Abstract presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- 21) **You, K.**, P. B. Flemings and D. DiCarlo, 2015 (<u>ORAL</u>), Quantifying hydrate solidification front advancing using method of characteristics, Abstract presented at 23<sup>rd</sup> Hubbert Quorum, San Francisco, 13 Dec.
- 22) **You, K.**, and P. B. Flemings, 2014, Dynamics of permafrost-associated methane hydrate during climate change, Abstract presented at 2014 Fall Meeting, AGU, San Francisco, 15-19 Dec.
- 23) **You, K.**, and P. B. Flemings, 2014, Salinity-buffered methane hydrate formation and dissociation in gas-rich systems, Abstract presented at the Gordon Research Conferences, Natural Gas Hydrate Systems, Galveston, TX, 24-28 March.
- 24) Darnell, K., P. B. Flemings, S. Bryant, and **K. You**, 2014, Simulations of seafloor methane venting from warming-induced hydrate destabilization, Abstract presented at the Gordon Research Conferences, Natural Gas Hydrate Systems, Galveston, TX, 24-28 March.
- 25) **You, K.**, and P. B. Flemings, 2014 (<u>ORAL</u>), Salinity-buffered methane hydrate formation and dissociation in gas-rich systems, Abstract presented at the Gordon Research Seminar, Natural Gas Hydrate Systems, Galveston, TX, 23 March.
- 26) **You, K.**, and P. B. Flemings, 2013, One dimensional advancing solidification front in the hydrate system, Abstract presented at 2013 Fall Meeting, AGU, San Francisco, 9-13 Dec.
- 27) Kneafsey, T., P. B. Flemings, S. Bryant, **K. You**, and P. Polito, 2013, Preliminary experimental examination of controls on methane expulsion during melting of natural gas hydrate systems, Abstract presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- 28) **You, K.**, and H. Zhan, 2012, Comparisons of diffusive and advective fluxes of gas phase volatile organic compounds (VOCs) in unsaturated zones under natural conditions, Abstract presented at 2012 Fall Meeting, AGU, San Francisco, 3-7 Dec.
- 29) **You, K.**, and H. Zhan, 2012 (<u>ORAL</u>), Transport mechanisms of gas phase volatile organic compounds (VOCs) in natural attenuation, Abstract presented at 2012 International Groundwater Forum, Baoding, China, 6-7 Jul.
- 30) **You, K.**, and H. Zhan, 2012 (<u>ORAL</u>), Investigation of gas phase volatile organic compounds transport in unsaturated zones under natural conditions, Abstract presented at 2012 IPACES Annual Meeting, Guangzhou, China, 3-4 Jul.
- 31) **You, K.**, and H. Zhan, 2012, Investigation of gas phase volatile organic compounds transport in unsaturated zones under natural conditions, Poster presented at 5<sup>th</sup> Annual Texas A&M Geology and Geophysics Research Symposium, College Station, Texas, 13 April.
- 32) **You, K.**, and H. Zhan, 2012 (<u>ORAL</u>), Investigation of the gas flow and vapor transport of volatile organic compounds (VOCs) in porous media, Abstract presented at 3<sup>rd</sup> Annual Berg-Hughes Center Research Conference and Problem Identification Workshop, College Station, Texas, 12 April.
- 33) You, K., and H. Zhan, 2011 (ORAL), Non-Fickian solute transport in a finite column test, Abstract

- presented at 2011 Fall Meeting, AGU, San Francisco, 5-9 Dec.
- 34) **You, K.**, and H. Zhan, 2011, Analytical investigation of gas flow to a barometric pumping well in a multi-layered unsaturated zone, Poster presented at 4<sup>th</sup> Annual Texas A&M Geology and Geophysics Research Symposium, College Station, Texas, 19 April.
- 35) **You, K.**, and H. Zhan, 2010, Investigation of gas flow to a barometric pumping well in unsaturated zones, Abstract presented at 2010 Fall Meeting, AGU, San Francisco, 13-17 Dec.
- 36) **You, K.**, and H. Zhan, 2010, Gas flow to a barometric pumping well in unsaturated zones, Abstract presented at 2010 Hydrology Conference, San Diego, 11-13 Oct.
- 37) **You, K.**, and H. Zhan, 2010, Gas flow to a barometric pumping well in a homogeneous unsaturated zone, Poster presented at 3<sup>th</sup> Annual Texas A&M Geology and Geophysics Research Symposium, College Station, Texas, 19 April.

# **TEACHING EXPERIENCES**

- 2018 Guest lecturer in Energy Exploration, University of Texas at Austin, Austin, Texas
- 2016 Guest lecturer in Energy Exploration, University of Texas at Austin, Austin, Texas
- 2015 Guest lecturer in Energy Exploration, University of Texas at Austin, Austin, Texas
- 2012 Guest lecturer in Hydrogeology, Texas A&M University, College Station, Texas
- 2010 Teaching Assistant in Geology 101, Texas A&M University, College Station, Texas

# **MENTORING EXPERIENCES**

Tiannong Dong (UTIG graduate student), Micro-Raman Characterization of pore-scale physics and chemistry of methane hydrate at pressure and temperature conditions relevant to natural reservoirs in the Gulf of Mexico, 2016-present

# **PROFESSIONAL SERVICES**

2011-Present Reviewer for Journal publications such as Geophysical Research Letter, Water Resources Research, Journal of Contaminant Hydrology, Marine and Petroleum Geology, Geological Journal, Journal of Engineering Mechanics, Vadose Zone Journal, Journal of Hydrologic Engineering, Journal of Sustainable Development, Hydrology and Earth System Sciences Discussions, Journal of Natural Gas Science & Engineering, Water, Energies

#### 2019-Present UTIG Postdoctoral Committee

- 2020 Discussion leader for keynote session in Gordon Research Seminar, Galveston, TX.
- 2020 Judge for 9th Annual Jackson School Student Research Symposium, University of Texas at Austin.
- 2019 Review IODP proposals
- 2019 Review UT Energy Institute proposals
- 2019 Review book proposals to ELSEVIER
- 2018 Session Chair in American Geophysical Union Conference, Washington DC.
- 2018 Session primary convener in American Geophysical Union Conference, Washington DC.
- 2018 Discussion leader in Gordon Research Seminar on "Natural Gas Hydrate Systems", Galveston, TX.
- 2018 Judge for 7th Annual Jackson School Student Research Symposium, University of Texas at Austin.
- 2017 Session convener in American Geophysical Union Conference, New Orleans.
- 2017 Judge for outstanding student poster in American Geophysical Union Conference, New Orleans.
- 2016 Session chair in American Geophysical Union Conference, San Francisco.

- Session primary convener in American Geophysical Union Conference, San Francisco.
   Judge for outstanding student poster in American Geophysical Union Conference, San Francisco.
   Judge for 4th Annual Jackson School Student Research Symposium, University of Texas at Austin.
- 2014 Discussion leader in Gordon Research Seminar on "Natural Gas Hydrate Systems", Galveston, TX.
- 2014 Judge for outstanding student poster in American Geophysical Union Conference, San Francisco.

# **PROFESSIONAL MEMBERSHIPS**

2010-Present American Geophysical Union