

## EDUCATION

**Massachusetts Institute of Technology**

Postdoctoral Associate, Department of Chemical Engineering

Advisor: Klavs F. Jensen

Cambridge, MA

2008-2010

**University of Michigan**

Ph.D., Chemical Engineering

Advisor: H. Scott Fogler

Ann Arbor, MI

2006

**University of Michigan**

M.S.E., Chemical Engineering

Ann Arbor, MI

2003

**Michigan Technological University**

B.S., Chemical Engineering

Summa Cum Laude (trimesters with grade scale: A, AB, B, BC, C, CD, F)

Houghton, MI

2001

## EMPLOYMENT HISTORY

2019-

**Associate Professor****New York University, Department of Chemical and Biomolecular Engineering**

Research interests include catalysis and reaction engineering, continuous-flow manufacturing, flow chemistry, microchemical systems, and machine intelligence. Please see <http://wp.nyu.edu/hartmanlab> for more information.

2015-2019

**Assistant Professor****New York University, Department of Chemical and Biomolecular Engineering**

January 2015

**Invited Visiting Assistant Professor****Institute of Condensed Matter Chemistry (CNRS), University of Bordeaux**

2010-2015

**Assistant Professor and Reichhold-Shumaker Fellow****University of Alabama, Department of Chemical and Biological Engineering**

2008-2010

**Postdoctoral Associate, Novartis-MIT Center for Continuous Manufacturing****Massachusetts Institute of Technology, Department of Chemical Engineering**

2005-2007

**Chemical Engineer III****Schlumberger, Pressure, Pumping, and Chemistry, Sugar Land, Texas**

## OTHER APPOINTMENTS

2020-

**Faculty Senate Council, Senator**

2020-

**Executive Board Member****International Symposium on Chemical Reaction Engineering (ISCRE)**

2019-

**Faculty Senate Council, Alternate Senator**

**New York University**

2017-	<b>Catalysis and Reaction Engineering Programming Chair</b> <b>CRE Executive Board, American Institute of Chemical Engineers</b>
2016-2018	<b>Faculty Engineer in Residence</b> <b>New York University, Department of Chemical and Biomolecular Engineering</b> Mentor startup companies in the NYU Tandon Future Labs.
2014-2016	<b>Reaction Engineering Programming Chair</b> <b>American Institute of Chemical Engineers</b>
2011-2015	<b>Adjunct Professor, Tri-Campus Materials Science Program</b> <b>University of Alabama, Department of Chemical and Biological Engineering</b>
2006-2007	<b>Department Quality Steering Committee Chair</b> <b>Schlumberger, Pressure, Pumping, and Chemistry, Sugar Land, Texas</b>
2003-2004, 2002	<b>Engineering Intern</b> <b>Schlumberger, Pressure, Pumping, and Chemistry, Sugar Land, Texas</b>
2001-2005	<b>Graduate Research Assistant/Fellow</b> <b>University of Michigan, Ann Arbor, Department of Chemical Engineering</b> Dissertation entitled “Zeolite Dissolution Phenomena”
2000	<b>Summer Chemical Engineering Intern</b> <b>BASF Corporation, Vitamins Manufacturing, Wyandotte, Michigan</b>

**POSTDOCS AND STUDENTS SUPERVISED (with current affiliations)****▪ Supervised postdoctoral associates (3):*****New York University***

Bruno Pinho, 2016 (Research Associate, University of Cambridge)

Chuntian Hu, 2015-2016 (Director of Reaction Engineering, Continuus Pharmaceuticals)

***University of Alabama***

Yizheng Chen, 2014 (Project Manager, R&amp;D, HuaTeng Pharmaceutical Company, Ltd.)

**▪ Advised PhD students (9):*****New York University***

Kelechi Ndukwe-Ajala, 2020-present (PhD)

Kevin Wolf, 2019-present (PhD)

Yukun Liu, 2016-present (PhD)

Benjamin Rizkin, 2016-2020 (PhD, Chemical Engineering, 2020; Senior Scientist I, Abbvie, Inc.)

Weiqi Chen, 2015-2019 (PhD, Materials Chemistry, 2019; Postdoctoral Associate, Department of Chemical and Biomolecular Engineering, University of Delaware)

Tianyi Hua, 2015-2020 (PhD, Materials Chemistry, 2020; Research Scientist)

***University of Alabama***

Chuntian Hu, 2010-2015 (PhD, Chemical Engineering, 2015; Director of Reaction Engineering,

Continuus Pharmaceuticals)

Brian S. Flowers, 2011-2015 (stayed at UA for his PhD; MS, 2013; Chair, Engineering and Physics, Midland College)

■ **Advised MS students (10):**

**New York University**

Abe Montes, 2021- (MS, Chemical Engineering)

Han Cheng, 2020- (MS, Chemistry)

David Ho, 2019-2020 (MS, Computer Science; Peloton)

Tony Guo, 2018-2019 (MS, Chemical Engineering, 2019; JP Morgan)

Priyangi Vashistha, 2016-2018 (MS, Chemical Engineering, 2018; Research Associate II, Illumina)

Isabella Hung, 2016-2018 (MS, Chemical Engineering, 2018; Associate Scientist, Mondelez International)

Daniel Luci, 2015-2017 (MS, Chemical Engineering, 2017; AI/ML Engineering, Koios Medical)

Karishma Minsariya, 2015-2017 (MS, Chemical Engineering, 2017; New Product Development Engineering, Kobayashi Healthcare International, Inc.)

Jasmine C. Sabio, 2015-2017 (MS, Chemical Engineering, 2017; Nanofabrication Process Engineer, CUNY Advanced Science Research Center)

**University of Alabama**

Jeffrey W. Horne, 2010-2012 (MS, 2012; Auburn University)

■ **Co-advised/Visiting Scholars (3)**

**Colorado School of Mines**

Jonathan D. Wells, Visiting Scholar, Spring 2019 from Center for Gas Hydrates (CSM)

**New York University**

Sandy Morais, 2016, Visiting Scholar, Summer 2016 from ICMCB-CNRS (PhD, 2017; Solvay)

**University of Alabama**

Spencer Alaniz, 2014-2015 Co-advised with K. H. Shaughnessy (PhD, expected 2019)

■ **Advised undergraduates (29) and K-12 students (14):**

**New York University**

Shahrin Haque, 2020- (BS, 2021)

Mahek Laul, 2020- (BS, 2021)

Edward Kim, 2020- (BS, 2021)

Maisha Ahmad, 2020- (BS, 2021)

Seongha Lee, 2019-2020 (BS, 2020; King Industries)

Ali Hasan, 2019 (BS, 2020; Snapdragon Chemistry, Inc.)

Albert Shkolnik, 2019-2020 (BS, 2020; US Navy)

Celymar Valentín-Valentín, Summer 2019 (BS University of Puerto Rico, NSF REU)

Neil Ferraro, 2018-2019 (BS, 2020; Accenture)

Danielle Grey-Stewart, Summer 2018 (BS MIT, NSF REU)

Aimen Shaikh, 2018-2019 (BS, 2019; System Performance Engineer, Cummins, Inc.)

Prableen Sethi, 2017-2019 (BS, 2019; TBD)

Soyun Pak, 2017-2018 (BS, 2018; TBD)

Stephen E. J. Tan, 2017-2018 (BS, 2018; Automation Engineer, Berkeley Lab)

Angeliki Chiti, 2015 (BS, 2015; TBD)

Lanqi Gong, 2015-2016 (BS, 2018 Biomolecular Science and Psychology; PhD Candidate,

Clinical Oncology, University of Hong Kong)  
Tenzin Choezin, K-12 ARISE, 2020  
Jason Li, K-12 InspirED, 2019-2020 (Brooklyn Technical High School)  
Mahmoud Elghayesh, K-12 ARISE, 2019 (Brooklyn Technical High School)  
Kazi Islam, K-12 ARISE, 2019 (Hillcrest High School)  
Karina Popovich, K-12 InspirED, 2018-2019 (Brooklyn Technical High School)  
Runnie Exuma, K-12 InspirED, 2017-2019 (Brooklyn Technical High School)  
Grace Lin, K-12 ARISE, 2018 (Stuyvesant High School)  
Marianne Lee, K-12 ARISE, 2018 (Stuyvesant High School)  
Tonni Sherard, K-12 ARISE, 2017 (Leon M. Goldstein HS for the Sciences)  
Lamiha Rahman, K-12 ARISE, 2017 (Francis Lewis High School)  
Waseer Mohamed, K-12 ARISE, 2016 (Bard High School Early College II)  
Ivanna Elkik, K-12 InspirED Brooklyn Technical HS, 2015 (BS, The City College of New York)

**University of Alabama**

T. Stewart Agricola, 2015 (BS, 2015; TBD)  
Chance Partlow, 2015 (BS, 2015; Auburn University, School of Pharmacy)  
Jasmine C. Sabio, 2014-2015 (BS, 2015; Nanofabrication Process Engineer, CUNY Advanced Science Research Center)  
Ria C. Domier, NSF REU 2011-2014 (BS, 2014; PhD, North Carolina State University)  
Michael Camara, 2013-2014 (BS, 2014; TBD)  
James E. Morris, 2013 (BS, 2014; Energen; NYU Stern)  
William Summers, 2013 (BS, 2013; UAB Medical School)  
Samantha Summers, NSF REU Penn State, 2012 (BS, 2014; PhD, University of Colorado)  
Craig Schwait, NSF REU Penn, 2011 (BS, 2012; ExxonMobil)  
Welsey C. Burkett, 2011-2012 (BS, 2012; Physician, Oklahoma City)  
Carina Herz, 2011-2012 (BS, 2012; Mercedes-Benz USA)  
Katherine Fontana, 2011-2012 (BS, 2012; Southern Company)  
Brittany Hovell, 2010-2011 (BS, 2011; TBD)  
Chase McCormack, K-12 Alabama School of Fine Arts, 2014-2015 (TBD)  
Hayden Fowler, K-12 Alabama School of Fine Arts, 2013-2014 (BS, University of Alabama, Huntsville)

▪ **Additional thesis committeees:**

***Institut de Chimie de la Matière Condensée de Bordeaux CNRS, Université de Bordeaux***

Na Liu, PhD Course, 2013 (TBD)

***New York University***

Andrea Angulo, PhD, Department of Chemical and Biomolecular Engineering, 2021

Joseph R. Cendagorta, PhD, Department of Chemistry, 2020

Xiaodi Zhong, PhD, Department of Chemistry, 2020

Daniela Blanco, PhD, Department of Chemical and Biomolecular Engineering, 2020 (Synthetics, Inc.)

Mersal Khwaja, MS, Department of Chemical and Biomolecular Engineering, 2019

Rito Yanagi, MS, Department of Chemical and Biomolecular Engineering, 2018

Sade Ruffin, PhD, Department of Chemical and Biomolecular Engineering, 2016 (Cummins, Inc.)

***Technical University of Denmark***

Albert E. Cervera, PhD Course, Chemical and Biochemical Engineering, 2012 (Novozymes)

***The City College of New York***

Sungyup Jung, PhD, Department of Chemical Engineering, defense scheduled July 2018

***University of Alabama***

Yuanyuan Song, PhD, Department of Mathematics, 2015 (Lecturer, University of Alabama)

Eric Zhang, PhD, Department of Chemical and Biological Engineering, 2015 (TBD)

Yaolin Zhang, MS, Department of Chemical and Biological Engineering, 2014 (TBD)

Arun Gupta, PhD, Electrical and Computer Engineering, 2014 (TBD)

Xi Xu, MS, Department of Chemical and Biological Engineering, 2012 (TBD)

**DISSERTATIONS AND THESES (ARCHIVED)****Doctor of Philosophy**

- 4) Hua, T. "Microfluidic Characterization and Modeling of Material Phase Change Kinetics with Non-covalent Interactions", Doctor of Philosophy in Materials Chemistry in the Department of Chemical and Biomolecular Engineering, New York University, January 2021. **[Global hypothesis: Non-covalent interactions that determine the three-dimensional molecular structure and phase behaviors of materials, often masked by transport phenomena, can be discovered by applying reaction engineering principles with microfluidic computational and experimental methods. Sponsored by the NYU MRSEC]**
- 3) Rizkin, B. A. "Artificially Intelligent Microreactors for Catalysis Discovery and Process Intensification", Doctor of Philosophy in Chemical Engineering in the Department of Chemical and Biomolecular Engineering, New York University, May 2020. **[Global hypothesis: Artificially intelligent, autonomous microreactors ( $\mu$ AIRs) engineered with online analytics accelerate, improve accuracy, and minimize the energy and environmental impacts during the iterative discovery of a next-generation olefin catalyst system. Sponsored by the National Science Foundation; grant with preliminary data submitted 2016]**
- 2) Chen, W. "A Study on Materials in Energy Science using Microfluidics with *In Situ* Raman Spectroscopy", Doctor of Philosophy in Materials Chemistry in the Department of Chemical and Biomolecular Engineering, New York University, September 2019. **[Global hypothesis: Microfluidics designed with *in situ* Raman spectroscopy can reveal the physical and chemical rate processes of complex materials in the energy sciences, and thus push the limits beyond what was previously thought possible in their discovery. Sponsored by the NYU MRSEC, Anadarko Petroleum Corporation, and ChampionX, an Ecolab Company]**
- 1) Hu, C. "Microchemical systems for understanding of multiphase flows in upstream hydrocarbon and natural gas productions", Doctor of Philosophy in Chemical Engineering in the Department of Chemical and Biological Engineering, University of Alabama, May 2015. **[Global hypothesis: Microchemical systems designed with *in situ* microscopy and in-line UV-vis spectroscopy facilitate the discovery of dispersants and asphaltenes science for upstream energy flow assurance. Sponsored by the Gulf of Mexico Research Initiative, Anadarko Petroleum Corporation, and ChampionX, an Ecolab Company; contract with preliminary data submitted 2011]**

**Master of Science**

- 5) Ho, D. "Using Word Embeddings in Abstracts to Accelerate Metallocene Catalysis Polymerization Research", Master of Science in the Computer Science in the Department of Computer Science and Engineering, New York University, May 2020. **[Application of**

**unsupervised machine learning to the field of metallocene polymerization catalysis.]**

- 4) Hung, I. "The Influence of  $\beta$ -cyclodextrin and Pd-II- $\beta$ -cyclodextrin on Methane Solubility in Water", Master of Science in Chemical Engineering in the Department of Chemical and Biomolecular Engineering, New York University, May 2018. **[An application of Raman spectroscopy with microfluidics to convolute complex coordination compounds in aqueous medium.]**
- 3) Vashistha, P. "The Role of the Ratio of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  in HZSM-5 on Asphaltenes Dissolution in a Packed-Bed Microreactor", Master of Science in Chemical Engineering in the Department of Chemical and Biomolecular Engineering, New York University, May 2018. **[An examination of the compositional influence of microfluidic, unconsolidated porous media on the dissolution of asphaltenes in xylenes.]**
- 2) Minsariya, K. "Influence of H-ZSM5 with Different  $\text{SiO}_2:\text{Al}_2\text{O}_3$  on Asphaltene Deposition in a Packed-Bed Microreactor", Master of Science in Chemical Engineering in the Department of Chemical and Biomolecular Engineering, New York University, May 2017. **[An investigation of the compositional influence of unconsolidated porous media on asphaltenes deposition using microfluidics and residence time distribution analyses.]**
- 1) Luci, D. "Motion Tracking Algorithm for Multiphase Microfluidics", Master of Science in Chemical Engineering in the Department of Chemical and Biomolecular Engineering, New York University, May 2017. **[Design of artificial intelligence with microreactors to evaluate bifurcating reaction chemistry.]**

**US PATENTS**

- 15) **Hartman, R.L. and Flowers, B.S.** "Methods and Apparatuses for Producing Clathrate Hydrates", New York University, US 10,947,114 (2021).
- 14) **Hartman, R.L.**, Panga, M.K.R., Drochon, B., Still, J.W., Abad, C., Garcia-Lopez De Victoria, M., England, K.W., and Aviles, I. "Methods to deliver fluids on a well site with variable solids concentration from solid slurries", Schlumberger Technology Corporation, US 10,011,763 (2018).
- 13) Panga, M.K.R., Photos, P.J., Drochon, B., Still, J.W., Gadiyar, B., **Hartman, R.L.**, and Stamm, B. "High Solids Content Methods and Slurries", Schlumberger Technology Corporation, US 9,238,772 (2016).
- 12) Fuller, M.J., Couillet, I. and **Hartman, R.L.** "Method of Treating Sandstone Formations with Reduced Precipitation of Silica", Schlumberger Technology Corporation, US 8,802,601 (2014).
- 11) Panga, M.K.R., Sullivan, P.F., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "High solids content slurries and methods", Schlumberger Technology Corporation, US 8,765,646 (2014).
- 10) **Hartman, R.L.**, Naber, J.R., Zaborenko, N., McMullen, J.P. and Jensen, K.F. "Methods for handling solids in microfluidic systems", Massachusetts Institute of Technology, US 8,763,623 (2014).

- 9) **Hartman, R.L.**, Panga, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 8,752,627 (2014).
- 8) **Hartman, R.L.**, Panga, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 8,496,056 (2013).
- 7) Panga, M.K.R., Photos, P.J., Drochon, B., Still, J.W., Gadiyar, B., **Hartman, R.L.**, and Stamm, B. "High Solids Content Slurries and Methods", Schlumberger Technology Corporation, US 8,490,698 (2013).
- 6) **Hartman, R.L.**, Sahoo, H. and Jensen, K.F. "Small-Scale Method and Apparatus for Separating Liquid Mixtures", Massachusetts Institute of Technology, US 8,435,387 (2013).
- 5) Panga, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W., and Stamm, B. "System and method for low damage gravel packing", Schlumberger Technology Corporation, US 8,210,249 (2012).
- 4) Panga, M.K.R., Sullivan, P.F., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "High Solids Content Slurries and Methods", Schlumberger Technology Corporation, US 8,119,574 (2012).
- 3) Panga, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "Method and composition comprising at least three different average particle volume particulates for low damage gravel packing", Schlumberger Technology Corporation, US 8,008,234 (2011).
- 2) Panga, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "System and Method for Low Damage Gravel Packing", Schlumberger Technology Corporation, US 7,789,146 (2010).
- 1) **Hartman, R.L.**, Panga, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 7,784,541 (2010).

## US PATENT APPLICATIONS

- 18) **Hartman, R.L.** and **Rizkin, B.A.** "Method and Apparatus for the Rapid Discovery and Design of Polymerizations", New York University, US 20210060514 (2021).
- 17) **Hartman, R.L.**, Garetz, B., **Hua, T.**, and Gowayed, O. "Systems and Methods for Continuous-Flow Laser-Induced Nucleation", New York University, US 20210025075 (2021).
- 16) **Hartman, R.L.** and **Flowers, B.S.** "Methods and Apparatuses for Producing Clathrate Hydrates", New York University, US 20150008367 (2015).
- 15) **Hartman, R.L.**, Panga, M.K.R., Drochon, B., Still, J.W., Abad, C., Garcia-Lopez De Victoria, M., England, K.W., and Aviles, I. "Methods to Deliver Fluids on a Well Site with Variable Solids Concentration from Solid Slurries", Schlumberger Technology Corporation, US 20140069645 (2014).
- 14) **Hartman, R.L.**, Panga, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 20130264055 (2013).
- 13) Panga, M.K.R., Sullivan, P.F., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "High Solids Content Slurries and Methods", Schlumberger Technology Corporation, US

20120138296 (2012).

- 12) Pang, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "System and Method for Low Damage Gravel Packing", Schlumberger Technology Corporation, US 20110265985 (2011).
- 11) Pang, M.K.R., Sullivan, P.F., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "High Solids Content Slurries and Methods", Schlumberger Technology Corporation, US 20110155371 (2011).
- 10) **Hartman, R.L.**, Naber, J.R., Zaborenko, N., McMullen, J.P. and Jensen, K.F. "Systems and Methods for Handling Solids in Microfluidic Systems", Massachusetts Institute of Technology, US 20110126914 (2011).
- 9) **Hartman, R.L.**, Pang, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 20110005760 (2011).
- 8) Pang, M.K.R., Sullivan, P.F., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "High Solids Content Methods and Slurries", Schlumberger Technology Corporation, US 20100300688 (2010).
- 7) Pang, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "System and Method for Low Damage Gravel Packing", Schlumberger Technology Corporation, US 20100243250 (2010).
- 6) Boney, C.L., Dessinges, M.N., Drochon, B., Williamson, D., Sullivan, P.F., Auzerais, F.M., Still, J.W., Kubala, G., Mackay, B.A., **Hartman, R.L.**, Couillet, I., Boyd, A. and Shampine, R. "Method for Completing Tight Oil and Gas Reservoirs", Schlumberger Technology Corporation, US 20100243242 (2010).
- 5) **Hartman, R.L.**, Sahoo, H. and Jensen, K.F. "Small-Scale Method and Apparatus for Separating Liquid Mixtures", Massachusetts Institute of Technology, US 20100122899 (2010).
- 4) Fuller, M.J., Couillet, I. and **Hartman, R.L.** "Method of Treating Sandstone Formations with Reduced Precipitation of Silica", Schlumberger Technology Corporation, US 20090233819 (2009).
- 3) **Hartman, R.L.**, Pang, M.K.R., Drochon, B. and Still, J.W. "System and Method for Low Damage Fracturing", Schlumberger Technology Corporation, US 20090025934 (2009).
- 2) Pang, M.K.R., Gadiyar, B., **Hartman, R.L.**, Drochon, B., Still, J.W. and Stamm, B. "System and Method for Low Damage Gravel Packing", Schlumberger Technology Corporation, US 20090025932 (2009).
- 1) Still, J.W., Couillet, I., MacKay, B.A. and **Hartman, R.L.** "Method of Heterogeneous Etching of Sandstone Formations", Schlumberger Technology Corporation, US 20080314594 (2008).

## JOURNAL PUBLICATIONS

(Published 3 postdocs, 11 graduate students, 9 undergraduates and 1 K-12 student; advised students underlined in bold)

\*Denotes New York University as the home institution of the corresponding author

\*\*Denotes University of Alabama as the home institution of the corresponding author

48) **Hua, T., Ahmad, M., Choezin, T.**, and Hartman, R.L.\* “Microbe-Worm Symbiosis Stabilizes Methane Hydrates in Deep Marine Environments” (in review).

46) Wells, J., **Chen, W.**, Hartman, R.L. and Koh, C. “Carbon dioxide hydrate in a microfluidic device: phase boundary and crystallization kinetics measurements with micro-Raman spectroscopy”, *J. Chem. Phys.*, 154, [114710 \(2021\)](#).

47) **Liu, Y., Sabio, J.**, and Hartman, R.L.\* “A Counter-Current Flow Micro-Packed-bed DBD Plasmatron for the Synthesis of a Methylated Cobaloxime”, *J. Phys. D: Appl. Phys.*, 54, [194003 \(2021\)](#).

45) Cellini, F., Lavini, F., Chen, E., Bongiorno, A., **Popovic, F.**, Hartman, R.L., Dingreville, R., and Riedo, E. “Pressure-induced formation and stiffness of 2D diamond boron nitride”, *Adv. Sci.* 8(2), 2002541 (2021).

44) **Hua, T., Valentín-Valentín, C.**, Gowayed, O., **Lee, S.**, Garetz, B.A., and Hartman, R.L.\* “Microfluidic Laser-Induced Nucleation of Supersaturated Aqueous Glycine Solutions”, *Cryst. Growth Des.*, 20(10), [6502-6509 \(2020\)](#).

43) **Ho, D., Shkolsnik, A.S., Ferraro, N.J., Rizkin, B.A.**, and Hartman, R.L.\* “Using Word Embeddings in Abstracts to Accelerate Metallocene Catalysis Polymerization Research”, *Comput. Chem. Eng.*, 141(4), [107026 \(2020\)](#).

42) **Rizkin, B.A.**, and Hartman, R.L.\* “Activation of Homogenous Polyolefin Catalysis with a Machine-Assisted Reactor Laboratory-in-a-Box ( $\mu$ AIR-LAB)”, *React. Chem. Eng.*, 5, [1450-1460 \(2020\)](#).

41) Morais, S., Cario, A., Liu, N., Bernard, D., Lecoutre, C., Garrabos, Y., Ranchou-Peyruse, A., Dupraz, S., Azaroual, M., Hartman, R.L., and Marre, S. “Studying key processes related to  $\text{CO}_2$  underground storage at the pore scale using high pressure micromodels”, *React. Chem. Eng.*, 5, [1156-1185 \(2020\)](#).

40) Hartman, R.L.\* “Flow Chemistry Remains an Opportunity for Chemists and Chemical Engineers”, *Curr. Opin. Chem. Eng.*, 29, [1-9 \(2020\)](#).

39) **Rizkin, B.A., Shkolsnik, A.S., Ferraro, N.J.**, and Hartman, R.L.\* “Combining automated microfluidic experimentation with machine learning for efficient polymerization design”, *Nat. Mach. Intell.*, 2, [200-209 \(2020\)](#).

38) **Rizkin, B.A.**, and Hartman, R.L.\* “Supervised Machine Learning for Prediction of Zirconocene-Catalyzed alpha-Olefin Polymerization”, *Chem. Eng. Sci.*, 210, [115224 \(2019\)](#).

37) **Chen, W., Guo, T.**, Kapoor, Y., Russel, C., Juyal, P., Yen, A., and Hartman, R.L.\* “An Automated Microfluidic System for the Investigation of Asphaltenes Deposition and Dissolution in Porous Media”, *Lab Chip*, 19, [3628-3640 \(2019\)](#). [Featured on the Back Cover]

36) **Rizkin, B.A., Popovic, F.**, and Hartman, R.L.\* “Spectroscopic microreactors for heterogeneous catalysis”, *J. Vac. Sci. Technol. A*, 37, [050801 \(2019\)](#). [Featured on the Front Cover]

35) **Liu, Y.** and Hartman, R.L.\* “Reaction kinetics of a water-soluble palladium- $\beta$ -cyclodextrin catalyst for a Suzuki-Miyaura cross-coupling in continuous-flow”, *React. Chem. Eng.*, 4, [1341-](#)

[1346 \(2019\)](#).

34) **Hua, T.**, Gowayed, O., **Grey-Stewart, D.**, Garetz, B.A., and Hartman, R.L.\* "Microfluidic Laser-Induced Nucleation of Supersaturated Aqueous KCl Solutions", *Cryst. Growth Des.*, 19(6), [3491-3497 \(2019\)](#).

33) **Hua, T.** and Hartman, R.L.\* "Computational Fluid Dynamics of DNA Origami Folding in Microfluidics", *React. Chem. Eng.*, 4, [1818-827 \(2019\)](#). **[Featured on the Front Cover]**

32) **Rizkin, B.A.**, **Popovich, K.**, and Hartman, R.L.\* "Artificial Neural Network Control of Thermoelectrically-Cooled Microfluidics using Computer Vision based on IR Thermography", *Comput. Chem. Eng.*, 121(2), [584-593 \(2019\)](#).

31) **Chen, W.** and Hartman, R.L.\* "Methane hydrate intrinsic dissociation kinetics measured in a microfluidic system by means of *in-situ* Raman spectroscopy" *Energy Fuel*, 32(11), [11761-11771 \(2018\)](#). **[Featured on a Supplementary Cover]**

30) **Chen, W.**, **Vashistha, P.**, Yen, A., Joshi, N., Kapoor, Y., and Hartman, R.L.\* "Asphaltenes dissolution mechanism study by *in-situ* Raman characterization of a packed-bed microreactor with HZSM-5 aluminosilicates" *Energy Fuel*, 32(12), [12205-12217 \(2018\)](#). **[Featured on a Supplementary Cover]**

29) **Rizkin, B.A.** and Hartman, R.L.\* "Catalytic activity of Pd/hydrophilic phosphine ligand in the interface of an aqueous-phase Cu-free Sonogashira coupling", *React. Chem. Eng.*, 3, [251-257 \(2018\)](#). **[Featured on the Inside Front Cover]**.

28) **Pinho, B.**, **Liu, Y.**, **Rizkin, B.**, and Hartman, R.L.\* "Confined methane-water interfacial layers and thickness measurements using *in situ* Raman spectroscopy". *Lab Chip*, 17, [3883-3890 \(2017\)](#).

27) **Pinho, B.**, **Minsariya, K.**, Joshi, N., Yen, A., and Hartman, R.L.\* "Role of HZSM-5 Aluminosilicates on Asphaltenes Deposition by High-throughput *in Situ* Characterizations of a Microreservoir". *Energy Fuel*, 31(11), [11640-11650 \(2017\)](#).

26) **Chen, W.**, **Pinho, B.**, and Hartman, R.L.\* "Flash crystallization kinetics of methane (sI) hydrate in a thermoelectrically-cooled microreactor", *Lab Chip*, 17, [3051-3060 \(2017\)](#) **[Featured on the Inside Front Cover]**.

25) **Pinho, B.** and Hartman, R.L.\* "Microfluidics with *in situ* Raman spectroscopy for the characterization of non-polar/aqueous interfaces", *React. Chem. Eng.*, 2, [189 \(2017\)](#) **[For the Invited Emerging Investigators Issue]**.

24) **Hu, C.**, Yen, A., Joshi, N., and Hartman, R.L.\* "Packed-bed Microreactors for Understanding of the Dissolution Kinetics and Mechanisms of Asphaltenes in Xylenes", *Chem. Eng. Sci.*, 140, [144-152 \(2016\)](#).

23) **Hu, C.**, Shaughnessy, K.H., and Hartman, R.L.\* "Influence of water on the deprotonation and the ionic mechanisms of a Heck alkynylation and its resultant E-factors", *React. Chem. Eng.*, 1, [65-72 \(2016\)](#) **[Featured on Front Cover of First Issue]**.

22) **Hu, C.**, Garcia, N., Xu, R., Cao, T., Yen, A., Garner, S., Macias, J., Joshi, N., and Hartman, R.L.\* "Interfacial Properties of Asphaltenes at the Heptol-Brine Interface", *Energy Fuel.*, 30, [80-87 \(2016\)](#).

- 21) **Sabio, J., Domier, R.C.**, Moore, J.N., Shaughnessy, K., and Hartman, R.L.\* “Palladium theory of aqueous-phase Heck alkynylations for intensification of discovery and manufacture”, *Chem. Eng. Technol.*, 38, [1717-1725 \(2015\)](#) [Invited Special Issue: Chemical Intensification in Flow – Novel Process Windows].
- 20) **Chen, Y., Sabio, J.C.**, and Hartman, R.L.\*\* “When solids stop flow chemistry in commercial tubing”, *J. Flow Chem.*, 5 (3), [166-171 \(2015\)](#) [Invited North America Special Issue].
- 19) **Hu, C., Sabio, J.C.**, and Hartman, R.L.\*\* “Role of water on the precipitation and deposition of asphaltenes in packed-bed microreactors”, *Ind. Eng. Chem. Res.*, 54 (16), [4103-4112 \(2014\)](#) [Invited Festschrift in Honor of H. Scott Fogler].
- 18) **Hu, C.** and Hartman, R.L.\*\* “High-throughput packed-bed microreactors with inline analytics for the discovery of asphaltene deposition mechanisms”, *AICHE J.*, 60, [3534-3546 \(2014\)](#).
- 17) **Hu, C., Morris, J.E.**, and Hartman, R.L.\*\* “Microfluidic investigation of the deposition of asphaltenes in porous media”, *Lab Chip*, 14, [2014-2022 \(2014\)](#) [Featured on the Back Cover].
- 16) **Domier, R.C.** and Hartman, R.L.\*\* “Chemical reaction engineering perspectives on the role of water in fine chemicals and pharmaceuticals manufacture”, *Chim. Oggi.-Chem. Today*, 32 (4), [17-21 \(2014\)](#).
- 15) **Hu, C., Herz, C.**, and Hartman, R.L.\*\* “Microfluidic dispersion of mineral oil-seawater multiphase flows in the presence of dialkyl sulfonates, polysorbates, and glycols”, *Green Process Synth.*, 2, 611-623 (2013).
- 14) **Domier, R.C.**, Moore, J.N., Shaughnessy, K., and Hartman, R.L.\*\* “Kinetic analysis of aqueous-phase Pd-catalyzed, Cu-free direct arylation of terminal alkynes using a hydrophilic ligand”, *Org. Process Res. Dev.*, 17 (10), [1262-1271 \(2013\)](#) [Invited Special Feature: Engineering Contributions to Process Development].
- 13) **Flowers, B.S.** and Hartman, R.L.\*\* “Particle handling techniques in microchemical systems”, *Challenges*, 3, [194-211 \(2012\)](#).
- 12) Hartman, R.L.\*\* “Managing solids in the upstream continuous processing of fine chemicals”, *Org. Process Res. Dev.*, 16, [870-887 \(2012\)](#) [Invited Special Feature: Continuous Processes].
- 11) Hartman, R.L., McMullen, J.P. and Jensen, K.F. “Deciding whether to go with the flow - evaluating the merits of flow reactors for synthesis”, *Angew. Chem. Int. Ed.*, 40, [2-20 \(2011\)](#).
- 10) Noel, T., Naber, J.R., Hartman, R.L., McMullen, J.P., Jensen, K.F. and Buchwald, S.L. “Palladium-catalyzed amination reactions in flow: overcoming the challenges of clogging via acoustic irradiation” *Chem. Sci.*, 2, [287-290 \(2011\)](#).
- 9) Kuhn, S., Hartman, R.L., Sultana, M., Nagy, K.D., Marre, S. and Jensen, K.F. “Teflon-coated silicon microreactors: impact on segmented liquid-liquid multiphase flows”, *Langmuir*, 27, [6519-6527 \(2011\)](#).
- 8) Hartman, R.L., Naber, J.R., Zaborenko, N. Buchwald, S.L. and Jensen, K.F. “Overcoming the challenges of solid bridging and constriction during Pd-catalyzed C-N bond formation in microreactors”, *Org. Process Res. Dev.*, 14, [1347-1357 \(2010\)](#).
- 7) Hartman, R.L., Naber, J.R., Buchwald, S.L. and Jensen, K.F. “Multi-step microchemical

synthesis enabled by microfluidic distillation”, *Angew. Chem. Int. Ed.*, 49, [899-903 \(2010\)](#).

- 6) Hartman, R.L. and Jensen, K.F. “Microchemical systems for continuous-flow synthesis”, *Lab Chip*, 9, [2495-2507 \(2009\)](#) **[Featured on Front Cover of invited issue]**.
- 5) Hartman, R.L., Sahoo, H.R., Yen, B.C. and Jensen, K.F. “Distillation in microchemical systems using capillary forces and segmented flow”, *Lab Chip*, 9, [1843-1849 \(2009\)](#) **[Featured on Front Cover]**.
- 4) Hartman, R.L. and Fogler, H.S. “Understanding the dissolution of zeolites”, *Langmuir*, 23, [5477-5484 \(2007\)](#) **[Featured on Front Cover]**.
- 3) Hartman, R.L. and Fogler, H.S. “The unique mechanism of analcime dissolution by hydrogen ion attack”, *Langmuir*, 22, [11163-11170 \(2006\)](#).
- 2) Hartman, R.L., Lecerf, B., Frenier, W., Ziauddin, M. and Fogler, H.S. “Acid-sensitive aluminosilicates: dissolution kinetics and fluid selection for matrix stimulation treatments”, *SPE Prod. Oper.*, 21, [194-204 \(2006\)](#).
- 1) Hartman, R.L. and Fogler, H.S. “Reaction kinetics and mechanisms of zeolite dissolution in hydrochloric acid”, *Ind. Eng. Chem. Res.*, 44, [7738-7745 \(2005\)](#).

## BOOKS EDITED

Wolf, N. and **Hartman, R.L.** (editors), "Formation, Removal, and Inhibition of Inorganic Scale in the Oilfield Environment" by W. Frenier and M. Ziauddin, Society of Petroleum Engineers, 2008, 230 pp.

## CONFERENCE PRESENTATIONS

**(Authored by 3 postdocs, 12 graduate students, 10 undergraduates, and 6 K-12 students; advised students underlined in bold)**

- 79) **Liu, Y., Sabio, J.C.**, and Hartman, R.L. “A counter-current flow micro-packed-bed DBD plasmatron for the synthesis of a methylated cobaloxime”, Microfluidics & Energy Symposium, April 29-30, 2021.
- 78) **Hua, T.** (speaker) and Hartman, R.L. “Nonphotochemical Laser-Induced Nucleation of Glycine Aqueous Solution in Microfluidics”, 2020 AIChE Virtual Meeting, San Francisco, CA (November 16-20, 2020).
- 77) **Liu, Y.** (speaker) and Hartman, R.L. “A Packed-Bed Dielectric Barrier Discharge Microplasmatron for Characterization of Plasma-Liquid Multiphase Flows”, 2020 AIChE Virtual Meeting, San Francisco, CA (November 16-20, 2020).
- 76) **Rizkin, B.A.** and Hartman, R.L. (speaker) “Artificial Intelligence with Microreactors for the Activity and Mechanism of a Zirconocene-Catalyzed Olefin Polymerization”, 2020 AIChE Virtual Meeting, San Francisco, CA (November 16-20, 2020).
- 75) **Rizkin, B.A.** (speaker) and Hartman, R.L. “Computer-Aided Investigation of a Zirconocene Catalyst’s Activity for 1-Hexene Polymerization”, 26<sup>th</sup> International Symposium on Chemical Reaction Engineering (ISCRE), New Delhi, India (accepted).

74) **Popovic, F.** (speaker) and Hartman, R.L. "Cyclodextrins As Mass Transfer Agents for Au-Pd Nanoparticle Catalyzed Selective Oxidation Reaction of Methane in a Microfluidic Flow System", 2019 AIChE Annual Meeting, Orlando, FL (November 10-15, 2019).

73) **Hua, T.** (speaker) and Hartman, R.L. "Nonphotochemical Laser-Induced Nucleation of KCl Aqueous Solution in Microfluidics", 2019 AIChE Annual Meeting, Orlando, FL (November 10-15, 2019).

72) **Liu, Y.** (speaker) and Hartman, R.L. "Catalytic Mechanism Study of a Palladium-Cyclodextrin Complex for a Suzuki-Miyaura Cross-Coupling with a Microfluidic Reactor", 2019 AIChE Annual Meeting, Orlando, FL (November 10-15, 2019).

71) **Rizkin, B.** (speaker) and Hartman, R.L. "Automated Machine Learning and Microfluidics-Based Study and Optimization of Metallocene Catalysts", 2019 AIChE Annual Meeting, Orlando, FL (November 10-15, 2019).

70) **Chen, W.** (speaker), **Guo, T.**, Kapoor, Y., Yen, A., and Hartman, R.L. "An Automated Microfluidic System for High-Throughput Mechanistic Study of Asphaltenes Deposition and Dissolution in Porous Media using *In-situ* Spectroscopy", 2019 AIChE Annual Meeting, Orlando, FL (November 10-15, 2019).

69) **Hua, T.** (speaker), **Valentin, C.**, Garetz, B.A., and Hartman, R.L. "Non-Photochemical Laser-Induced Nucleation of Glycine Supersaturated Solution in Microfluidics", 2019 Gotham-Metro Condensed Matter Meeting, New York, NY (October 5, 2019).

68) **Hasan, A.** (speaker), **Liu, Y.**, and Hartman, R.L. "Catalyzing Suzuki-Miyaura Reactions Using Cyclodextrin Supported Palladium Complex in a Continuous-Flow Micro-Reactor", NYU 2019 Summer Research Program Poster Conference, Brooklyn, NY (August 8, 2019).

67) **Valentin, C.** (speaker), **Hua, T.**, Gowayed, O., Garetz, B., and Hartman, R.L. "Microfluidic Non-Photochemical Laser Induced Nucleation of Supersaturated Glycine", NYU MRSEC NSF REU Program Poster Conference, Brooklyn, NY (August 8, 2019).

66) **Chen, W.** (speaker), and Hartman, R.L. "Crystallization and Dissociation Study of Methane Hydrate in a Microfluidic System", 24<sup>th</sup> International Conference on the Chemistry of the Organic Solid State (ICCOSS XXIV), New York, NY (June 16-21, 2019).

65) **Exuma, R.** (speaker), **Liu, Y.**, and Hartman, R.L. "Mechanism Analysis of a Palladium Catalyzed Synthetic Chemistry in Micro-fluidic System", 2019 Research Expo, NYU Tandon School of Engineering, Brooklyn, NY (May 3, 2019).

64) Hartman, R.L. (speaker), **Chen, W.**, and **Rizkin, B.A.** "Towards Intelligent Multiphase Laboratory Reactors with *In Situ* Characterizations", 4<sup>th</sup> North American Symposium on Chemical Reaction Engineering, Houston, TX (March 10-13, 2019).

63) **Chen, W.** (speaker), **Pinho, B.**, and Hartman, R.L. "Methane (sI) Hydrate Crystallization and Dissociation in a Thermoelectrically-Cooled Microreactor", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).

62) **Chen, W.** (speaker), **Vashistha, P.**, Yen, A., Joshi, N., Yogesh, K., and Hartman, R.L. "The Influence of the Reservoir Acidity on Asphaltenes Dissolution in Aromatic Solvent Using Microsystems with *in Situ* Spectroscopy", 2018 AIChE Annual Meeting, Pittsburgh, PA (October

28-November 2, 2018).

- 61) Hartman, R.L. (speaker) "Probing the Reacting Interface of a Liquid-Liquid Cu-Free Sonogashira Coupling", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).
- 60) **Hua, T.** (speaker), and Hartman, R.L. "A Computational Fluid Dynamics Study on Reactor Selection for DNA Origami Folding Kinetics", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).
- 59) **Liu, Y.** (speaker), and Hartman, R.L. "Water Soluble Palladium- $\beta$ -Cyclodextrin Complex and Its Catalytic Performance for a Suzuki-Miyaura Cross-Coupling in Flow", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).
- 58) **Rizkin, B.A.** (speaker), and Hartman, R.L. "Leveraging Open Source, Big Data and the Cloud for Chemical Process Control", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).
- 57) **Rizkin, B.A.** (speaker), and Hartman, R.L. "Open Source Controls, Cloud Computing and Paradigm Changes in Laboratory-Scale Reactor Control", 2018 AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2018).
- 56) **Shaikh, A.** (speaker), **Liu, Y.**, and Hartman, R.L. "Performance evaluation of a cyclodextrin-supported palladium complex in catalyzing Suzuki-Miyaura cross-coupling reactions", NYU 2018 Summer Research Program Poster Conference, New York, NY (August 3, 2018).
- 55) **Grey-Stewart, D.** (speaker), **Hua, T.**, Gowayed, O., Garetz, B., and Hartman, R.L. "Microfluidic Laser-Induced Nucleation of Supersaturated KCl Solutions", NYU MRSEC NSF REU Program Poster Conference, New York, NY (August 3, 2018).
- 54) **Chen, W.** (speaker), **Vashistha, P.**, Yen, A., Joshi, N., Yogesh, K., and Hartman, R.L. "A mechanistic study of asphaltenes dissolution in aromatic solvents using a pack-bed microreactor with *in situ* spectroscopy", 17<sup>th</sup> International Conference on Organized Molecular Films, NYU Tandon School of Engineering (July 23-27, 2018).
- 53) **Hua, T.** (speaker) and Hartman, R.L. "Computational fluid dynamics of microfluidics for DNA origami folding in continuous-flow", 17<sup>th</sup> International Conference on Organized Molecular Films, NYU Tandon School of Engineering (July 23-27, 2018).
- 52) **Chen, W.** (speaker), **Vashistha, P.**, Yen, A., Joshi, N., Yogesh, K., and Hartman, R.L. "A mechanistic study of asphaltenes dissolution in aromatic solvents using a pack-bed microreactor with *in situ* spectroscopy", 19<sup>th</sup> International Conference on Petroleum Phase Behavior and Fouling, Park City, UT (July 8-12, 2018).
- 51) **Chen, W.**, Joshi, N., **Liu, Y.**, **Minsariya, K.**, **Pinho, B.**, **Rizkin, B.**, Yen, A., and Hartman, R.L. (speaker) "Cooperative discovery with multiphase microreaction engineering and *in situ* Raman spectroscopy", 25<sup>th</sup> International Symposium on Chemical Reaction Engineering, Florence, Italy (May 20-23, 2018).
- 50) **Liu, Y.**, **Rizkin, B.A.**, **Exuma, R.** (speakers), **Chen, W.**, **Hua, T.**, and Hartman, R.L. "Microreaction engineering with *in situ* spectroscopy for discovery in chemicals, energy, and materials", NYU Tandon Research Expo, New York University, Brooklyn, NY (April 27, 2018).

49) **Chen, W.** (speaker), **Pinho, B.**, and Hartman, R.L. "Methane (sI) hydrate crystallization in a thermoelectrically-cooled microreactor", Advanced Energy Conference, New York, NY (March 26-28, 2018).

48) **Chen, W., Hua, T., Liu, Y., Rizkin, B.**, and Hartman, R.L. "Microreaction Engineering with In Situ Spectroscopy for Discovery in Chemicals, Energy, and Materials", ExxonMobil Poster Reception, New York University, New York, NY (December 7, 2017).

47) **Luci, D.** and Hartman, R.L. (speaker) "Motion Tracking of Liquid-Liquid Segmented Flows in Microfluidics and Application to the Briggs-Rauscher Oscillating Reaction", 2017 AIChE Annual Meeting, Minneapolis, MN (October 29-November 3, 2017).

46) **Pinho, B., Minsariya, K., Chen, W.** and Hartman, R.L. (speaker) "Heterogeneous Interfaces Confined in Microreactors and Characterized By *in situ* Spectroscopic Techniques", 2017 AIChE Annual Meeting, Minneapolis, MN (October 29-November 3, 2017).

45) **Pinho, B.** and Hartman, R.L. (speaker) "Layered Fluid-Fluid Interfaces Confined in Microfluidics", 2017 AIChE Annual Meeting, Minneapolis, MN (October 29-November 3, 2017).

44) **Pinho, B.** (speaker), Yen, A., Joshi, N., and Hartman, R.L. "Influence of  $\text{Al}_2\text{O}_3/\text{SiO}_2$  ratio on asphaltenes precipitation in a packed-bed microreactor with *in situ* analytics", 18<sup>th</sup> International Conference on Petroleum Phase Behavior and Fouling, Le Havre, France (June 11-15, 2017).

43) **Chen, W., Elkik, I., Hua, T., Pinho, B., Sabio, J.C.**, (co-speakers) and Hartman, R.L. "Microfluidics: From Visualization to Trapping Methane onto Coffee Grounds", NYU Tandon Research Expo, New York University, Brooklyn, NY (April 21, 2017).

42) **Pinho, B.** (speaker) and Hartman, R.L. "Microfluidics for the Characterization of Non-Polar/Aqueous Interfaces", Graduate Recruiting Symposium, Department of Chemical and Biomolecular Engineering, New York University, Brooklyn, NY (March 10 and 23, 2017).

41) **Hua, T.** (speaker) and Hartman, R.L. "DNA Origami Self-Assembly Study in a Continuous-flow Microreactor", Graduate Recruiting Symposium, Department of Chemical and Biomolecular Engineering, New York University, Brooklyn, NY (March 10 and 23, 2017).

40) **Chen, W.** (speaker) and Hartman, R.L. "Methane Hydrate Crystallization in a Multiphase Microsystem", Graduate Recruiting Symposium, Department of Chemical and Biomolecular Engineering, New York University, Brooklyn, NY (March 10 and 23, 2017).

39) **Sabio, J.C.** (speaker) and Hartman, R.L. "Design and Fabrication of a Microplasmatron for C-H Activation of Methane", CUNY Advanced Science Research Center Open House, New York, NY (November 18, 2016).

38) **Pinho, B.** (speaker) and Hartman, R.L. "A Multiphase Semi-Flow Microreactor to Study the Influence of Water on Organometallic Catalysis", 2016 AIChE Annual Meeting, San Francisco, CA (November 13-18, 2016).

37) **Hu, C.**, Shaughnessy, K.H., and Hartman, R.L. (speaker) "The E-factor of the Thin Film and Its Characterization to Understand Why Water Influences a Heck Alkynylation", 2016 AIChE Annual Meeting, San Francisco, CA (November 13-18, 2016).

36) **Hu, C.**, Shaughnessy, K.H., and Hartman, R.L. (speaker) "Influence of Water on the Deprotonation and the Ionic Mechanisms of a Heck Alkynylation and Its Resultant E-factors", 24<sup>th</sup> International Symposium on Chemical Reaction Engineering, Minneapolis, MN, June 14, 2016.

35) Hartman, R.L. (speaker) "Microreaction Engineering Chemistry in Flow for Sustainable Chemicals, Energy, and Healthcare", 2015 AIChE Annual Meeting, Salt Lake City, UT, November 9, 2015.

34) **Sabio, J.C.** (speaker), **Domier, R.C.**, Moore, J.N., Shaughnessy, K.H., and Hartman, R.L. "Palladium Theory of Aqueous-Phase Heck Alkynylations", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

33) **Domier, R.C.**, Alaniz, S., Moore, J.N., Shaughnessy, K.H., and Hartman, R.L. (speaker) "Palladium Theory for Aqueous-Phase Catalyzed Cu-Free Sonogashira Couplings", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

32) Hartman, R.L. (speaker) "Flow Chemistry with Microchemical Systems for Chemicals, Energy, Healthcare, and Sustainability", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

31) **Flowers, B.S.** (speaker) and Hartman, R.L. "Increases in Methane/Water Solubility Via the Addition of  $\alpha$ -Cyclodextrin and Its Effects on the Microfluidic Synthesis of Methane (sI) and Propane (sII) Hydrates", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

30) **Hu, C.** (speaker) and Hartman, R.L. "Microfluidic Investigation of the Deposition of Asphaltenes in Porous Media", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

29) **Chen, Y.** and Hartman, R.L. (speaker) "Controlled Accumulation of Inorganic Salts in Microreactors for Palladium-Catalyzed Amination", 2014 AIChE Annual Meeting, Atlanta, GA (November 16-21, 2014).

28) **Flowers, B.S.** (speaker) and Hartman, R.L. "Microfluidic Synthesis of Methane (sI) and Propane (sII) Hydrates", International Conference on Gas Hydrates, Beijing, China (July 28-August 1, 2014).

27) **Fowler, H.**, Hallman, M., and Hartman, R.L. "The effect of  $\alpha$ -cyclodextrin on the solubility of methane into water for the formation of clathrate hydrates", Intel International Science Fair, Los Angeles, CA (May 11-16, 2014).

26) **Flowers, B.S.** and Hartman, R.L. (speaker) "Microfluidic synthesis of methane (sI) and propane (sII) hydrates", 2013 MRS Fall Meeting & Exhibit, Boston, MA (December 1-6, 2013).

25) **Domier, R.C.** (speaker), Moore, J.N., Shaughnessy, K.H., and Hartman, R.L. "Kinetic Analysis of Aqueous- Phase Pd-Catalyzed, Cu-Free Direct Arylation of Terminal Alkynes Using a Hydrophilic Ligand", AIChE Annual Meeting, San Francisco, CA (November 3-8, 2013).

24) **Flowers, B.S.** (speaker) and Hartman, R.L. "Microfluidic Synthesis of Methane (sI) and Propane (sII) Hydrates", AIChE Annual Meeting, San Francisco, CA (November 3-8, 2013).

- 23) **Domier, R.C.**, Moore, J.N., Shaughnessy, K.H., and Hartman, R.L. (speaker) "Continuous Fine Chemicals Processing with Aqueous Phase Organic Synthesis", AIChE Annual Meeting, San Francisco, CA (November 3-8, 2013).
- 22) Liu N. (speaker), Aymonier C., Lecoutre C., Garrabos Y., Hartman R.L., and Marre S. "Geological Labs On-Chip for Studying Key Aspects of CO<sub>2</sub> Geological Storage", AIChE Annual Meeting, San Francisco, CA (November 3-8, 2013).
- 21) **Domier, R.C.** (speaker), Moore, J.N., Shaughnessy, K.H., and Hartman, R.L. "Continuous Microchemical Aqueous-Phase Catalyzed Synthesis in Biphasic Media", 2013 Diversity Awareness Symposium, Department of Chemistry, The University of Alabama, Tuscaloosa, AL (April 27, 2013).
- 20) **Summers, S.** (speaker), **Hu, C.**, Bao, Y., and Hartman, R.L. "Accumulation of BSA in Packed-bed Microfluidics", 65<sup>th</sup> Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Diego, CA (November 18-20, 2012).
- 19) Hartman, R.L. (speaker) "Reaction Engineering and Separations in Microchemical Systems: Applications in Fine Chemicals Processing and Energy Production", AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2012).
- 18) **Flowers, B.** (speaker) and Hartman, R.L. "Microchemical Synthesis of Non-Covalently Bonded Materials", AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2012).
- 17) **Hu, C.** (speaker) and Hartman, R.L. "Microfluidic Characterization of Immiscible Oil-Seawater-Silicate Multiphase Flow", AIChE Annual Meeting, Pittsburgh, PA (October 28-November 2, 2012).
- 16) **Burkett, W.C., Domier, R.C., Flowers, B.S., Herz, C., Hu, C.**, and Hartman, R.L. (speaker) "Chemical Reaction Engineering Education of the Millennials", ASEE Chemical Engineering Division Summer School, University of Maine, Orono, ME (July 20-27, 2012).
- 15) **Domier, R.C.** (speaker), **Hu, C.**, and Hartman, R.L. "Understanding the Role of Hydrate Particle Interactions in Subsea Pipelines", UA Undergraduate Research and Creative Activity Conference, University of Alabama, Tuscaloosa (April 9, 2012).
- 14) **Herz, C.** (co-speaker), **Burkett, W.C.** (co-speaker), and Hartman, R.L. "Developing Methods for the Chemical Engineering Education of the Millennials", presented at the UA Undergraduate Research and Creative Activity Conference, University of Alabama, Tuscaloosa (April 9, 2012).
- 13) **Schwait, C.** (Speaker), Xu, Y., Bao, Y., and Hartman, R.L. "Microfluidic Modeling of the Effects of Nanoparticles on the Blood-Brain Barrier in Flow", 64<sup>th</sup> Annual Meeting of the American Physical Society Division of Fluid Dynamics, Baltimore, MD (November 20-22, 2011).
- 12) **Horne, W.J.** (speaker) and Hartman, R.L. "Understanding Organic Scale Deposition In Microfluidic Systems for Fine Chemical Synthesis", AIChE Annual Meeting, Minneapolis, MN (October 16-21, 2011).
- 11) **Hu, C., Herz, C.** (speaker), and Hartman, R.L. "Microfluidic Characterization of Dispersants Used In the Gulf of Mexico Oil Spill", AIChE Annual Meeting, Minneapolis, MN (October 16-21, 2011).

- 10) **Burkett, W.C.** (speaker), **Hu, C.**, and Hartman, R.L. "Understanding Methane Hydrate Formation in Microchemical Systems", UA Undergraduate Research and Creative Activity Conference, University of Alabama, Tuscaloosa (April 11, 2011).
- 9) **Herz, C.** (speaker), Hu, C., and Hartman, R.L. "Microfluidic Characterization of the Dispersants used in the Gulf of Mexico Oil Spill", UA Undergraduate Research and Creative Activity Conference, University of Alabama, Tuscaloosa (April 11, 2011).
- 8) Hartman, R.L. (speaker), Naber, J.R., Buchwald, S.L. and Jensen, K.F. "Overcoming the Challenges of Bridging and Constriction During Pd-Catalyzed C-N Bond Formation in Microreactors" AIChE Annual Meeting, Salt Lake City, UT (November 7-12, 2010).
- 7) Hartman, R.L. (speaker) and Jensen, K.F. "Back to the Future – A New Generation of Chemical Reaction Engineering Challenges", AIChE Annual Meeting, Nashville, TN (November 8-13, 2009).
- 6) Hartman, R.L. (speaker), Naber, J.R., Sahoo, H.R., Yen, B.C., Buchwald, S.L. and Jensen, K.F. "Microchemical Synthesis Facilitated by Microfluidic Distillation", AIChE Annual Meeting, Nashville, TN (November 8-13, 2009).
- 5) Hartman, R.L. (speaker), Zaborenko, N., Naber, J.R., Sultana, M., Buchwald, S.L. and Jensen, K.F. "Handling Solids in Microreactors for Continuous-flow Synthetic Chemistry", AIChE Annual Meeting, Nashville, TN (November 8-13, 2009).
- 4) Hartman, R.L. (speaker) and Fogler, H.S. "Zeolite Dissolution Phenomena", 7th World Congress of Chemical Engineering, Glasgow, Scotland (July 10-14, 2005).
- 3) Hartman, R.L. (speaker) and Fogler, H.S. "Zeolite Dissolution Kinetics", AIChE Annual Meeting, Austin, TX (November 7-12, 2004).
- 2) Hartman, R.L. (speaker) and Fogler, H.S. "The Kinetics of Zeolite Dissolution: Studies on Silicon Precipitation, Reaction Kinetics, and the Nature of Acid Attack", AIChE Annual Meeting, San Francisco, CA (November 16-21, 2003).
- 1) Hartman, R.L., Lecerf, B., Frenier, W., Ziauddin, M. (speaker), Fogler, H.S. "Acid Sensitive Aluminosilicates: Dissolution Kinetics and Fluid Selection for Matrix Stimulation Treatments", 2003 SPE European Formation Damage Conference, The Hague, Netherlands (May 13-14, 2003).

## INVITED PRESENTATIONS

(includes 27 domestic academic, 5 international academic, and 8 Fortune 500 companies)

- 70) Hartman, R.L. "Machine-Assisted Microfluidics for the Discovery of Polyolefin Catalysis", Microfluidics & Energy Symposium, April 29-30, 2021.
- 69) Hartman, R.L. "Machine-Assisted Design of a Metallocene Catalyzed Olefin Polymerization", Center for Process Analysis & Control (CPAC) Workshop, University of Washington Rome Center, Rome, Italy, March 22-24, 2021.
- 68) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Department of Chemical and Biomolecular Engineering, Rice University, Houston, TX, February 9, 2021.

- 67) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Corteva Agrosciences, Indianapolis, IN, (December 4, 2020).
- 66) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Cross-MRSEC Research Seminar Series, June 17, 2020.
- 65) Hartman, R.L. "Organic Scale in the Oilfield using Automated Microfluidics", ChampionX, An Ecolab Company, March 27, 2020.
- 64) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Biomedical, Biological, and Chemical Engineering, University of Missouri, Columbia, MO, March 3, 2020.
- 63) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Department of Chemistry, SUNY, Geneseo, NY, November 1, 2019.
- 62) Hartman, R.L. "Mechanistic Insights on Organometallic Catalysis using Microreactors with *In Situ* Spectroscopy", 2019 Frontiers of Inorganic and Organometallic Chemistry Lecture Series, ACS Local Section, Columbia University, New York, NY, October 18, 2019.
- 61) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Department of Chemical and Biological Engineering, Princeton University, Princeton, NJ, October 9, 2019.
- 60) Hartman, R.L. "Artificially Intelligent Microreactors with *In Situ* Characterizations for Energy, Chemicals, and Materials", Department of Chemical and Biological Engineering, Colorado School of Mines, Golden, CO, September 27, 2019.
- 59) Hartman, R.L. "Design of Microreactors with *in situ* Spectroscopy and Machine Intelligence for Faster Discovery", Department of Chemical Engineering, University of Arkansas, Fayetteville, AR, September 19, 2019.
- 58) Rizkin, B.A. and Hartman, R.L. "Supervised Machine Learning for Zirconocene Polyolefin Catalyst Design", ACS Central Regional Meeting, Process Chemistry & Development, Midland, MI, June 3-7, 2019.
- 57) Hartman, R.L. "Multiphase microreactors with in-situ spectroscopy as a gateway to process intensification in energy and fuels", ACS Spring 2019 National Meeting & Exposition, Division of Energy and Fuels, Distinguished Researcher Award: Symposium in Honor of Anne Gaffney, Orlando, FL, March 31-April 4, 2019.
- 56) Hartman, R.L. "Multiphase microreactors with in-situ spectroscopy as a gateway to process intensification in energy and fuels", ACS Spring 2019 National Meeting & Exposition, Division of Energy and Fuels, Poster Reception, Orlando, FL, March 31-April 4, 2019.
- 55) Hartman, R.L. "Intelligent Microreactors with *In Situ* Characterization Methods for Chemicals, Energy, and Materials", School of Chemical Engineering, Oklahoma State University, Stillwater, OK, April 9, 2019.
- 54) Hartman, R.L. "Artificially Intelligent Microreactors with *In Situ* Characterization Methods with Potential Applications in Energy, Chemicals, and Materials", Department of Chemical Engineering, University of Virginia, Charlottesville, VA, March 21, 2019.

53) Hartman, R.L. "Towards intelligent multiphase laboratory reactors for discovery in chemicals, energy, and sustainability", Sabic Americas, Sugar Land, TX, October 4, 2018.

52) Hartman, R.L. "Towards intelligent multiphase laboratory reactors for discovery in chemicals, energy, and sustainability", William G. Lowrie Department of Chemical and Biomolecular Engineering, The Ohio State University, Columbus, OH, September 13, 2018.

51) Hartman, R.L., "Reaction Mechanism at the Interface of a Cu-Free Sonogashira Coupling in Water", 17<sup>th</sup> International Conference on Organized Molecular Films, NYU Tandon School of Engineering, Brooklyn, NY, July 23-27, 2018.

50) Hartman, R.L. "Microfluidics with *in situ* Raman spectroscopy for the discovery of reaction mechanisms in fine chemicals and pharmaceutical chemistry", 2<sup>nd</sup> NYU Biomedical and Biosystems Conference, NYU Tandon School of Engineering, Brooklyn, NY, June 25-27, 2018.

49) Hartman, R.L. "Multiphase Microreaction Engineering with Online Analytics for Discovery in Chemicals, Energy, and Materials", Department of Chemical and Biomolecular Engineering, University of Houston, Houston, TX, April 6, 2018.

48) Hartman, R.L. "Heterogeneous Interfaces Confined in Microfluidics Characterized by *in situ* Raman Spectroscopy", Center for Process Analysis & Control (CPAC) Workshop, University of Washington Rome Center, Rome, Italy, March 19-21, 2018.

47) Hartman, R.L. "Multiphase Microreaction Engineering with Online Analytics for Discovery in Chemicals, Energy, and Materials", Catalysis Seminar Series, Department of Chemical and Biomolecular Engineering, University of California, Berkeley, CA, October 16, 2017.

46) Hartman, R.L. "Multiphase Microreaction Engineering with Online Analytics for Discovery in Chemicals, Energy, and Materials", Robert Frederick Smith School of Chemical and Biomolecular Engineering, Cornell University, Ithaca, NY, August 28, 2017.

45) Hartman, R.L. "Chemical Reaction Engineering New Tools for Discovery and Development in Flow", Department of Biochemical and Chemical Engineering, Technische Universität Dortmund, Dortmund, Germany, July 19, 2017.

44) Hartman, R.L. "Multiphase Microreaction Engineering with *in situ* Analytics for Energy, Materials, and Pharmaceuticals", Mini Symposium on High Pressure Microfluidics and Flow Chemistry, Institute of Condensed Matter Chemistry of the Bordeaux University (ICMCB-CNRS), Bordeaux, France, June 13, 2017.

43) Hartman, R.L. "Chemical Reaction Engineering New Tools for Discovery and Development", 1st NYU Biomedical and Biosystems Conference, NYU Abu Dhabi Institute, United Arab Emirates, April 10, 2017.

42) Hartman, R.L. "Microfluidics with *in situ* Raman Spectroscopy for the Characterization of Non-Polar/Aqueous Interfaces", Center for Process Analysis & Control (CPAC) Workshop, University of Washington Rome Center, Rome, Italy, March 21, 2017.

41) Hartman, R.L. "Flow Chemistry with Microsystems Laboratory" Workshop on Nanomaterials Manufacturing for Energy Applications, Department of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, January 17-18, 2017.

- 40) Hartman, R.L. "Reaction Engineering New Tools for Discovery and Development", BMS Fall Inductions Ceremony, Meet the Professionals Series, New York University, Brooklyn, NY, December 16, 2016.
- 39) Hartman, R.L. "Reaction Engineering New Tools for Discovery and Development", Department of Chemical Engineering, Worcester Polytechnic Institute, Worcester, MA, December 7, 2016.
- 38) Hartman, R.L. "Reaction Engineering New Tools for Discovery and Development", Exxon Mobil Research, Annandale, NJ, November 4, 2016.
- 37) Hartman, R.L. "Reaction Engineering New Tools for Discovery and Development", Corning, Inc., Corning, NY, June 20, 2016.
- 36) Hartman, R.L. "Green Catalysis and Reaction Engineering for Discovery and Development", Bristol-Myers Squibb, Green Chemistry Symposium, New Brunswick, NJ, June 5, 2016.
- 35) Hartman, R.L. "Microchemical Systems for High-throughput Discovery and Development in Energy Sciences", Nalco Champion, An Ecolab Company, Sugar Land, Texas, April 11, 2016.
- 34) Hartman, R.L. "Flow Chemistry and Engineering using Water for a Heck Alkynylation", Center for Process Analysis & Control (CPAC) Workshop, University of Washington Rome Center, Rome, Italy, March 21, 2016.
- 33) Hartman, R.L. "Flow Chemistry and Engineering with Microchemical Systems for Chemicals, Energy, Healthcare, and Sustainability", New York University, Courant Institute of Mathematical Sciences, Applied Mathematics Lab Seminar Series, New York, NY, November 19, 2015.
- 32) Hartman, R.L. "Flow Chemistry with Microsystems for Chemicals, Energy, Healthcare, and Sustainability", Faculty Meets Faculty Luncheon Series, Tandon School of Engineering, New York University, Brooklyn, NY, October 14, 2015.
- 31) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, Healthcare, and Sustainability", New York University, Department of Chemical and Biomolecular Engineering, Brooklyn, NY, September 11, 2015.
- 30) Hartman, R.L. "Flow Chemistry using Microchemical Systems for Chemicals, Energy, Healthcare, and Sustainability", Dow Chemical Company, Midland, MI, May 7, 2015.
- 29) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Healthcare Sustainability", University of Southern California, Mork Family Department of Chemical Engineering and Material Science, Los Angeles, CA, April 8, 2015.
- 28) Hartman, R.L. "Flow Chemistry using Microchemical Systems for Sustainable Fine Chemicals, Materials, Natural products, and Pharmaceuticals", Center for Process Analysis & Control (CPAC) Workshop, University of Washington Rome Center, Rome, Italy, March 24, 2015.
- 27) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Healthcare Sustainability", Department of Chemical and Biomolecular Engineering, New York University, New York, NY, March 12, 2015.
- 26) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Healthcare Sustainability", Department of Chemical Engineering, The City College of New York, New York, NY, February 10, 2015.

- 25) Hartman, R.L. "Flow Chemistry using Microchemical Systems for Sustainable Fine Chemicals and Pharmaceuticals", Institute of Condensed Matter Chemistry of the Bordeaux University (ICMCB-CNRS), Bordeaux, France, January 26, 2015.
- 24) Hartman, R.L. "Flow Chemistry using Microchemical Systems for Sustainable Energy and Materials", Institute of Condensed Matter Chemistry of the Bordeaux University (ICMCB-CNRS), Bordeaux, France, January 19, 2015.
- 23) Hartman, R.L. "Aqueous and Natural Gas Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Sustainability", 21<sup>st</sup> International Congress of Chemical and Process Engineering, Prague, Czech Republic, August 23-27, 2014.
- 22) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, Healthcare Devices, and Sustainability", Department of Chemical, Biological, and Environmental Engineering, Oregon State University, Corvallis, OR, June, 2014.
- 21) Hartman, R.L. "Flow Chemistry with Microchemical Systems for Chemicals, Energy, Healthcare Devices, and Sustainability", Department of Chemical Engineering, University of Massachusetts, Amherst, MA, May, 2014.
- 20) Hartman, R.L. "Aqueous and Natural Gas Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Sustainability", Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD, March 11, 2014.
- 19) Hartman, R.L. "Aqueous Flow Chemistry and Engineering for Fine Chemicals and Pharmaceuticals Manufacture", 4<sup>th</sup> International Conference of the Flow Chemistry Society, Barcelona, Spain, February 18-19, 2014.
- 18) Hartman, R.L. "Aqueous and Natural Gas Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Sustainability", Department of Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champaign, IL, January 16, 2014.
- 17) Hartman, R.L. "Aqueous and Natural Gas Flow Chemistry with Microchemical Systems for Chemicals, Energy, and Sustainability", Department of Chemical and Biomolecular Engineering, University of California, Los Angeles, CA, January 7, 2014.
- 16) Hartman, R.L. "Water Science and Engineering with Microchemical Systems for Applications in Energy, Sustainability, and Chemicals Processing", Department of Chemical and Life Science Engineering, Virginia Commonwealth University, Richmond, VA, September 25, 2013.
- 15) Hartman, R.L. "Water Science and Engineering with Microchemical Systems for Applications in Energy, Sustainability, and Chemicals Processing", 9<sup>th</sup> World Congress of Chemical Engineering, Seoul, Korea, August 18-23, 2013.
- 14) Hartman, R.L. "Engineering Heterogeneous Reactions for Continuous Specialty Chemical Processing", Center for Process Analysis and Control/ATOCHIMIS 2013 Workshop, University of Washington, Rome Center, Italy, Spring 2013.
- 13) Hartman, R.L. "Water Science and Engineering with Microchemical Systems for Applications in Energy, Sustainability, and Chemicals Processing", Department Seminar, Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA, Spring 2013.

- 12) Hartman, R.L. "Water Science and Engineering with Microchemical Systems for Applications in Energy, Sustainability, and Chemicals Processing", Department Seminar, Department of Chemical and Biomolecular Engineering, Clemson University, Clemson, SC, Spring 2013.
- 11) Hartman, R.L. "Water Science and Engineering with Microchemical Systems for Applications in Energy, Sustainability, and Chemicals Processing", Department Seminar, Dave C. Swalm School of Chemical Engineering, Mississippi State University, Mississippi State, MS, Spring 2013.
- 10) Hartman, R.L. "Engineering Heterogeneous Reactions for Continuous Specialty Chemicals Processing", Invited Key Speaker, Micro Flow Chemistry and Biology Workshop, Mövenpick, Dead Sea, Jordan, November 2012.
- 9) Hartman, R.L. "Microchemical Systems for Fine Chemicals Processing and Energy Production", Strategic Energy Institute Seminar Series, Department of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, October 1, 2012.
- 8) Hartman, R.L. "Engineering Heterogeneous Reactions in Micro-scale Laminar Flow for Fine Chemicals Processing", Seminar, Flow Chemistry Workshop, Bristol-Myers Squibb, New Brunswick, NJ, September, 2012.
- 7) Hartman, R.L. "Engineering Heterogeneous Reactions in Micro-scale Laminar Flow for Fine Chemicals Processing", Department Seminar, Department of Chemical and Biochemical Engineering, Technical University of Denmark, Lyngby, Denmark, January 31, 2012.
- 6) Hartman, R.L. "Engineering Heterogeneous Reactions in Micro-flow for Fine Chemicals Manufacturing and Sustainable Energy", Distinguished Seminar Series, Department of Chemical Engineering, Auburn University, Auburn, AL, September 28, 2011.
- 5) Hartman, R.L. "Engineering Microchemical Reactions and Separations for Fine Chemicals: Opportunities to Impact Oilfield Chemistry", Schlumberger Cambridge Research, Cambridge, UK, July 15, 2011.
- 4) Hartman, R.L. "Continuous Flow Manufacturing of Fine Chemicals – Engineering Heterogeneous Reactions in Confined Spaces", Institute of Condensed Matter Chemistry of the Bordeaux University (ICMCB-CNRS), Bordeaux, France, March 15, 2011.
- 3) Hartman, R.L. and Jensen, K.F. "Silicon-based Microchemical Systems for Continuous-flow Synthesis", Corning S.A.S. Symposium on Continuous-Flow Reactor Technology for Industrial Applications, Madrid, Spain, October 12, 2009.
- 2) Hartman, R.L. "Chemical Engineering in the Oilfield: Reservoir Stimulation", AIChE Seminar, Kansas State University, Department of Chemical Engineering, Manhattan, KS, November, 2007.
- 1) Hartman, R.L. "An Overview of Schlumberger: Technology, Culture, and Career Opportunities for Chemical Engineers", AIChE Luncheon, University of Michigan, Department of Chemical Engineering, Ann Arbor, MI, March, 2007.

## TEACHING EXPERIENCE

**(GY/graduate; UY/undergraduate) Instructor: 4.8/5.0; Course: 4.7/5.0**

Spring 2021

**CBE-UY 3223: Kinetics and Reactor Design**

New York University, Department of Chemical and Biomolecular Engineering

Fall 2020	<b>CBE-GY 9413: Design of Chemical and Biological Microsystems</b> New York University, Department of Chemical and Biomolecular Engineering
Spring 2020	<b>CBE-UY 3223: Kinetics and Reactor Design</b> New York University, Department of Chemical and Biomolecular Engineering
Fall 2019	<b>CBE-UY 4113: Engineering Laboratory I</b> New York University, Department of Chemical and Biomolecular Engineering
Spring 2019	<b>CBE-UY 3223: Kinetics and Reactor Design</b> New York University, Department of Chemical and Biomolecular Engineering
Fall 2018	<b>CBE-GY 9413: Design of Chemical and Biological Microsystems</b> New York University, Department of Chemical and Biomolecular Engineering New graduate elective that complements the department's new cleanroom facilities.
Spring 2018	<b>CBE-GY 6813: Reactor Design and Analysis</b> New York University, Department of Chemical and Biomolecular Engineering
Fall 2017	<b>CBE-GY 9413: Design of Chemical and Biological Microsystems</b> New York University, Department of Chemical and Biomolecular Engineering New graduate elective that complements the department's new cleanroom facilities.
Spring 2017	<b>CBE-UY 3223: Kinetics and Reactor Design</b> New York University, Department of Chemical and Biomolecular Engineering
Fall 2016	<b>CBE-UY 4143: Process Dynamics and Control</b> New York University, Department of Chemical and Biomolecular Engineering
Fall 2015	<b>CBE-UY 4143: Process Dynamics and Control</b> New York University, Department of Chemical and Biomolecular Engineering
Spring (2012-2015)	<b>CHE 354: Chemical Reactor Design</b> University of Alabama, Department of Chemical and Biological Engineering
Fall (2011-2014)	<b>CHE 554: Chemical Reaction Engineering</b> University of Alabama, Department of Chemical and Biological Engineering
Fall 2010	<b>CHE 481: Chemical Process Design I</b> University of Alabama, Department of Chemical and Biological Engineering
Spring 2010	<b>10.494 Integrated ChemE Topics III: Chemical and Biological Microsystems (with Klavs F. Jensen)</b> Massachusetts Institute of Technology, Department of Chemical Engineering
October 2007	<b>Carbonate and Sandstone Acidizing</b> Schlumberger field engineer training, Sugar Land, TX

Winter 2003

**CHE 344: Reaction Engineering and Design**(Graduate Student Instructor with **H. Scott Fogler**)

University of Michigan, Ann Arbor, Department of Chemical Engineering

## EDUCATION INNOVATION

- **Implementation of reactor design safety modules** (CBE-UY 3223: Kinetics and Reactor Design) that strengthen safety across the chemical engineering curriculum.
- **Developed new graduate elective** (CBE-GY 9413: Design of Chemical and Biological Microsystems) that complements the department's new cleanroom facilities.
- **Developed an open-ended design project on microsystems** (CBE-GY 9413). The students design a microsystem of their choice (in teams) using what they learned throughout the semester. They are asked to present an executive summary, elevator pitch presentation (analogous to a gateway style business development meeting), a formal project report, and a final presentation.
- **Design of a continuous-flow reactor experiment for chemical engineering laboratory** (CBE-UY 4113/4213). I asked one of my undergraduate researchers to investigate continuous-flow reactor technology that we could potentially purchase for our newly renovated unit operations laboratory. Technology was identified and an experiment designed that combines the Corning Lab Reactor technology with computational fluid dynamics simulations. We are in the process of seeking funds to pay for the new equipment.
- **Socratic reasoning practice in my graduate courses** (CBE-GY 6813/9413). I train the students to ask six types of Socratic questions using journal article assignments twice throughout the semester. Teaching them to peel the onion to the core is integral for their postgraduate careers.
- **Computational fluid dynamics simulations in my graduate courses** (CBE-GY 6813/9413). The students are asked to solve (in a course project and one homework assignment) the coupled PDEs that describe momentum, heat, and mass transfer combined with reactions to practice realistic chemical engineering problems. Applications in the assignments range from microfluidic devices to the design of chemical reactors.
- **Use of my laboratory's research discoveries in lectures and assignments** (All courses). I routinely use our published work to teach concepts in my courses.
- **Development of open-ended projects in undergraduate reactor design** (CHE 354). In the past, I have asked the students to complete an open-ended reactor design project on a societal problem. Examples of topics include pharmacokinetics, alcohol metabolism, and the manufacture of materials for superconducting high-speed train magnets. Some of the applications are derived from my consulting experience.
- **Developed an extra-credit football flag game and an open-ended project disseminated via YouTube videos** (CHE 354). The students are given yellow football flags at the beginning of each semester. The first student who throws a flag when I make a mistake or tell a bad joke in lecture gets awarded extra credit. The students also create a 1-3 min YouTube video that teaches a reactor design topic of their choice.
- **InspirED with Brooklyn Technical High School, Brooklyn, NY**: NSF CAREER Award partnership with one of the top K-12 tech schools in the USA that offers students the opportunity to conduct research in Prof. Hartman's laboratory with the ultimate goals of completing senior research theses and outreaching science and engineering beyond NYU's borders.

- **Alabama School of Fine Arts, Birmingham, AL:** Partnership with the Science and Mathematics Department that offers K-12 students the opportunity to complete their senior research thesis in Prof. Hartman's laboratory and express ChemE concepts through visual arts.

## OTHER K-12 OUTREACH

**NYU Applied Research Innovations in Science and Engineering (ARISE) program:** This full-time, seven-week program for 10<sup>th</sup> and 11<sup>th</sup> grade New York Students includes: i) college level workshops and seminars, ii) a high-level research experience in the Hartman Laboratory, and iii) mentoring in that placement by a graduate/postdoctoral student. Students are introduced to key elements of academic research: the scientific method and ethics, data collection and analysis, research practices, and lab safety.

## HONORS AND RECOGNITION

- Research featured on the cover of *Reaction Chemistry & Engineering* 2018
- Outstanding Reviewer for *Reaction Chemistry & Engineering* (Top 10) 2017
- Research featured on the cover of *Lab on a Chip* 2017
- Article highlighted in NSF Science360 News 2017
- Catalysis and Reaction Engineering Programming Chair, American Institute of Chemical Engineers 2017-present
- Advisory Board, *Reaction Chemistry & Engineering*, The Royal Society of Chemistry 2016-present
- Outstanding Reviewer for *Reaction Chemistry & Engineering* (Top 10) 2016
- Research featured on the cover of *Reaction Chemistry & Engineering* 2016
- National Science Foundation CAREER Award 2015
- Invited Visiting Assistant Professor, ICMCB-CNRS, Université de Bordeaux 2015
- Research featured on the cover of *Lab on a Chip* 2014 2014
- Research featured in *Lab on a Chip 2014 HOT Articles* 2014
- Alabama Science and Engineering Fair honors with invitation to the Intel International Science and Engineering Fair, Alabama School of Fine Arts, K-12 2014
- Reaction Engineering Programming Chair, American Institute of Chemical Engineers 2014-2016
- Member of the National Academy of Inventors 2013
- Research Stimulation Award, University of Alabama, Office of Sponsored Programs 2013
- AIChE Recognition as a Senior Member 2012
- Research Grants Committee Award, University of Alabama, Office of Sponsored Programs 2011
- Chemical Engineering Distinguished Lecture Series, Auburn University 2011
- Article highlighted in *Chemistry World* 2011
- Article highlighted in *Conveying News* 2011
- Research work cited in *Angewandte Chemie International Edition News* 2010
- Schlumberger Inventor Award 2007
- Schlumberger Rewards of Excellence for Innovation 2007
- University of Michigan Rackham Travel Grant 2004-2005
- Research Partnership to Secure Energy for America (RPSEA) Fellow 2003-2004

- Summa Cum Laude undergraduate honors 2001

## MEMBERSHIPS AND CERTIFICATIONS

- Flow Chemistry Society (Member) 2014-present
- Materials Research Society (Member) 2013-2018
- ASEE Chemical Engineering Summer School 2012
- American Association for the Advancement of Science (Member) 2011-2018
- American Chemical Society (Member) 2011-2018
- Sigma Xi, The Scientific Research Society (Full member) 2009-2018
- American Society for Engineering Education (Member) 2008-2018
- Society of Petroleum Engineers (Member) 2001-2005, 2011-2017
- Tau Beta Pi, Engineering Honors Society (Member) 2000-present
- American Institute of Chemical Engineers (Senior member) 1999-present
- Managing and Leading Your People (Schlumberger) 2007
- Project Management (Schlumberger) 2007
- Underwater helicopter escape and offshore survival 2007
- DNV ISO 9001 Internal Auditor Course (similar to ABET auditing) 2007
- Lean Six Sigma – White Belt 2006
- International Society of Pharmaceutical Engineers (Member) 2001-2005
- Fundamentals of Engineering Exam 2001

## PROFESSIONAL SERVICE (INTERNAL AND COMMUNITY)

- NYU MRSEC Executive Planning Committee 2020-
- NYU Senate Financial Affairs Committee 2020-
- NYU Senate Committee on Organization and Governance 2020-
- NYU T-FSC Finance Committee 2020-
- NYU Tandon Faculty Executive Committee 2020-
- NYU Faculty Senate Council, Senator 2020-
- NYU Faculty Senate Council, Alternate Senator 2019-2022
- NYU Tandon CBE ad hoc Contract Faculty Review Committee (Chair) 2020-
- NYU MRSEC NSF REU Review Committee 2019-2020
- NYU Tandon Staff Search Committee 2019
- NYU Tandon CBE: Industrial Advisory Board Selection Committee 2019
- NYU Tandon CBE: MS Program Committee 2019-
- NYU Tandon CBE: Graduate Recruiting Committee 2018-
- NYU Tandon: Tau Beta Pi Rho Chapter, Faculty Chapter Advisor 2016-
- NYU Tandon: Vice Dean Search Committee 2018-2019
- NYU Tandon CBE: Chemical Engineering Laboratory Committee 2015-
- NYU Tandon CBE: Department Graduate Studies Committee 2015-2018
- NYU Tandon CBE: invited and hosted academic, industrial, and government speakers for department colloquium 2015-2018
- NYU Tandon CBE: helped recruit new faculty hires 2015-2018
- NYU Tandon CBE: Graduate Student Recruiting Fair, AIChE Annual Meeting 2015-
- NYU Tandon: Curriculum Committee Consultant 2015-2016

▪ NYU Faculty Job Search Panel for STEM Students	2015-2016
▪ NYU Tandon: Alumni Day Dean's Luncheon Speaker	2015
▪ Hope for New York: The Father's Heart Ministries	2015
▪ UA AIChE intramural flag football	2014
▪ UA Tau Beta Pi, Faculty Chapter Advisor	2013-2014
▪ UA K-12 recruiting	2011-2013
▪ UA Department Seminar Coordinator, Chemical and Biological Engineering	2012-2013
▪ UA Environmental Health and Safety, University Laboratory Safety Committee	2012-2015
▪ UA Department Head Search Committee Member	2012
▪ UA Department Faculty Search Committee Member	2011-2012
▪ Participated in UA Remembers 4-27-11: A Day of Service (for Tornados)	2012
▪ Tuscaloosa tree cleanup volunteer the week following the tornados	2011

## PROFESSIONAL SERVICE (EXTERNAL)

- Scientific Committee, Microfluidics & Energy Symposium, 2020-
- Executive Board, International Symposium on Chemical Reaction Engineering (ISCRE), 2020-
- Chair, AIChE CRE Division Diversity and Inclusion Task Force, 2019-2020
- Co-chair, Industry 4.0 and Digital Transformation Session at the 2019 AIChE Annual Meeting
- Technical Committee, 21<sup>st</sup> International Conference on Petroleum Phase Behavior and Fouling (PetroPhase), New Jersey, Summer, 2020
- Judge, *Poster Session*, 4<sup>th</sup> North American Symposium on Chemical Reaction Engineering", Houston, TX (March 10-13, 2019)
- Co-Chair, *Shale Gas Conversion*, 4<sup>th</sup> North American Symposium on Chemical Reaction Engineering", Houston, TX (March 10-13, 2019)
- Reviewer, 20<sup>th</sup> International Conference on Petroleum Phase Behavior and Fouling (PetroPhase), Kanazawa, Japan, June 2-6, 2019
- Reviewer, 19<sup>th</sup> International Conference on Petroleum Phase Behavior and Fouling (PetroPhase), Park City, UT, July 8-12, 2018
- Reviewer, 25<sup>th</sup> International Symposium on Chemical Reaction Engineering, Florence, Italy, 2018
- Technical Committee, 17<sup>th</sup> International Conference on Organized Molecular Films, NYU Tandon School of Engineering, July 23-27, 2018
- Catalysis and Reaction Engineering Programming Chair, American Institute of Chemical Engineers, 2017-present
- Judge, *Area 20 Poster Session*, 2017 AIChE Annual Meeting, Minneapolis, MN
- Invited participant, *DOE Workshop on Nanomaterials Manufacturing for Energy Applications*, Department of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, January 17-18, 2017
- Invited Panelist, 2016 NSF CBET CAREER Proposal Writing Webinar
- Chair/Co-Chair, Novel Reactors and Process Intensification, 24<sup>th</sup> International Symposium on Chemical Reaction Engineering, Minneapolis, MN, 2016
- F-EIR Mentor, Alexapath, Inc. (NYU Future Labs), 2016-2017
- Scientific Committee, 24<sup>th</sup> International Symposium on Chemical Reaction Engineering, 2014-2016
- Co-Chair, *Reaction Engineering in Pharmaceuticals and Fine Chemicals*, 2015 AIChE Annual Meeting, Salt Lake City, UT
- Reaction Engineering Programming Chair, American Institute of Chemical Engineers, 2014-2015
- Invited participant, *Data-Driven Organic Chemistry: Enabling and Innovating the Study of*

*Chemical Reactions*, NSF sponsored workshop to drive the sustainability of the US economy and workforce, Washington, DC, September 11-12, 2014

- Chairman, *2020+ Chemical Manufacturing, Multi-impact – from Green Chemistry to Green Energy*, 21<sup>st</sup> International Congress of Chemical and Process Engineering CHISA 2014, Czech Republic, Prague
- Chair, *Green Chemical Reaction Engineering for Sustainability*, 2014 AIChE Annual Meeting, Atlanta, GA
- Chair, *Reaction Engineering in Pharmaceuticals and Fine Chemicals*, 2014 AIChE Annual Meeting, Atlanta, GA
- Chair, *Green Chemical Reaction Engineering for Sustainability*, 2013 AIChE Annual Meeting, San Francisco, CA
- Chair, *Reaction Engineering in Pharmaceuticals and Fine Chemicals*, 2013 AIChE Annual Meeting, San Francisco, CA
- Co-Chair, *Microreaction Engineering Session*, 2013 AIChE Annual Meeting, San Francisco, CA
- Judge, *Area 20 Poster Session*, 2013 AIChE Annual Meeting, San Francisco, CA
- Chair, *Microreaction Engineering II Session*, 2012 AIChE Annual Meeting, Pittsburgh, PA
- Co-Chair, *Microreaction Engineering I Session*, 2012 AIChE Annual Meeting, Pittsburgh, PA
- Co-Chair, *Microreaction Engineering Session*, 2011 AIChE Annual Meeting, Minneapolis, MN
- Co-Chair, *Reaction Engineering in Pharmaceuticals and Fine Chemicals*, 2012 AIChE Annual Meeting, Pittsburgh, PA
- Co-Chair, *Reaction Engineering in Pharmaceuticals and Fine Chemicals*, 2011 AIChE Annual Meeting, Minneapolis, MN
- Judge, *Undergraduate Student Poster Session*, 2011 AIChE Annual Meeting, Minneapolis, MN
- Judge, *Undergraduate Student Poster Session*, 2010 AIChE Annual Meeting, Salt Lake City, UT
- NSF: Panel Reviewer (2011-2020; CBET, ERC, EFRI, SBIR/STTR, CAREER)
- ACS PRF Reviewer (2015, 2017, 2018, 2019)
- US DOE: Graduate Fellowship Program Reviewer (2012), Office of Basic Energy Sciences Merit Reviewer (2016)

**Refereed journals/publishers:** *ACS Catalysis*, *ACS Sustainable Chemistry & Engineering*, *AIChE Journal*, *Chemical Engineering Progress*, *Chemical Engineering Science*, *Chemical & Engineering Technology*, *Chimica Oggi.-Chemistry Today*, *Crystal Growth & Design*, *Energy & Fuels*, *Green Chemistry*, *Industrial & Engineering Chemistry Research*, *International Journal of Heat & Mass Transfer*, *Journal of Chemical Engineering Education*, *Journal of Colloid & Interface Science*, *Journal of Flow Chemistry*, *Journal of Organic Chemistry*, *Journal of Physics D: Applied Physics*, *Lab on a Chip*, *Langmuir*, *Nature Geoscience*, *Organic Process Research & Development*, *Prentice Hall PTR*, *Reaction Chemistry & Engineering*, *RSC Advances*, *Scientific Reports*, *The Society of Petroleum Engineer's Books*, and *Topics in Catalysis*

### Guest Editor

- *Reaction Chemistry & Engineering* (2020- ): *Digitalization of Reaction Engineering*
- *Current Opinion in Chemical Engineering* (2021- ): *Data-Centric Catalysis & Reaction Engineering*
- *Journal of Flow Chemistry* (2020-2021): *Engineering Aspects of Flow Chemistry*