

Jin Gyun Lee

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EDUCATION

Doctor of Philosophy in Chemical Engineering.

May 2021

Louisiana State University, Baton Rouge, LA

Bachelor of Science in Chemical Engineering, Cum Laude.

December 2015

North Carolina State University, Raleigh, NC

PROFESSIONAL EXPERIENCE

Department of Chemical & Biological Engineering, Univ. of Colorado, Boulder, CO

June 2021-present

Postdoctoral Associate

Research advisor: Prof. C. Wyatt Shields IV, Assistant Professor

- Active colloids for biomedical applications

Cain Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA

2016-2021

Graduate Research Assistant

Research advisor: Prof. Bhuvnesh Bharti, Assistant Professor

- Active and responsive materials
- Ecofriendly plant-based substitutes to non-biodegradable materials
- Protein adsorption and corona formation on nanoparticles

Department of Chemical and Biomolecular Engineering, NC State University, Raleigh, NC

2014-2016

Undergraduate Researcher

Research advisor: Prof. Fanxing Li, Associate Professor

- Core-shell redox catalysts for clean and efficient fuel conversions

ACADEMIC ACHIEVEMENTS AND AWARDS

- Economic Development Assistantship by LSU Graduate School *2018-2021*
- Langmuir Student Awards Session in the 93rd ACS Colloid & Surface Science Symposium *2019*
- Coates Travel Award by LSU Cain Department of Chemical Engineering *2018 & 2019*
- NSF I-Corps Travel Award by LSU Office of Innovation & Technology Commercialization *2019*
- ACS Colloid and Surface Chemistry Division Outstanding Student Poster Award from the 255th ACS National Meeting *2018*

PUBLICATIONS

- [1] **J.G. Lee**, A.A. Harraq, K.J.M. Bishop, and B. Bharti, "Fabrication and Electric Field-Driven Active Propulsion of Patchy Microellipsoids", *The Journal of Physical Chemistry B*, 125 (16), 4232-4240 (2021). [link](#)
- [2] **J.G. Lee**,[†] Y. Guo,[†] J.A. Belgodere, A.A. Harraq, A.A. Hymel, A.J. Pete, K.T. Valsaraj, M.G. Benton, M.G. Miller, J.P. Jung, and B. Bharti, "Lignin-Zein Composite: Synthesis, 3D printing and microbial degradation", *ACS Sustainable Chemistry & Engineering*, 9 (4), 1781-1789 (2021). [†]equal contribution [link](#)
- [3] N.P. Holley, **J.G. Lee**, K.T. Valsaraj, and B. Bharti, "Synthesis and characterization of Zein-based Low Density Porous Absorbent (ZELDA) for oil spill recovery", *Colloids and Surfaces A: Physicochemical and Engineering Aspect*, (614), 126148 (2021). [link](#)

- [4] **J.G. Lee**, K. Lannigan, W.A. Shelton, J. Meissner, B. Bharti, “Adsorption of myoglobin and corona formation on silica nanoparticles”, *Langmuir*, 36 (47), 14157-14165 (2020). [link](#)
- [5] A.A. Harraq, **J.G. Lee**, and B. Bharti, “Magnetic field driven assembly and reconfiguration of multicomponent of supraparticles”, *Science Advances*, Vol.6, no. 19, eaba5337 (2020). [link](#)
- [6] Y. Ma, Y. Wu, **J.G. Lee**, L. He, G. Rother, A.L. Fameau, W.A. Shelton, and B. Bharti, “Adsorption of Fatty Acid Molecules on Amine-Functionalized Silica Nanoparticles: Surface Organization and Foam Stability”, *Langmuir*, 36 (14), 3703-3712 (2020). [link](#)
- [7] **J.G. Lee**, A.M. Brooks, K.J.M. Bishop, W.A. Shelton, B. Bharti, “Directed Propulsion of Spherical Particles along three dimensional Helical Trajectories”, *Nature Communications*, 10, 1, 2575, (2019). [link](#) – Highlighted in *Nature Nanotechnology* (2019 July issue), Yahoo News, BioMed Report, Morning Star etc.
- [8] T.O. Jegede, K.B. McKee, M. Porter, A.E. Webb, **J.G. Lee**, N.M.K. Arachchige, J.R. Ragains, N. Elgrishi, J.C. Garno, “Approaches for Sample Characterization and Lithography with Nanoparticles using Modes of Scanning Probe Microscopy”, *Madridge Journal of Analytical Sciences and Instrumentation*, 4, 1, (2019). [link](#)
- [9] **J.G. Lee**, L.L Larive, K.T. Valsaraj, B. Bharti, “Binding of Lignin Nanoparticles at Oil-Water Interfaces: An Ecofriendly Alternative to Oil Spill”, *ACS Applied Materials & Interfaces*, 10 (49), 43282-43289 (2018). [link](#)
- [10] **J.G. Lee**, V. Porter, W. A. Shelton, B. Bharti, “Magnetic Field-Driven Convection for Directed Surface Patterning”, *Langmuir*, 34 (50), 15416-15424 (2018). [link](#)

PATENT

- B. Bharti and **J.G. Lee**, “Lignin Composition, Methods of Making and Using the Composition for Adsorption onto Petrochemical Oil and Oil Removal from Water Surface”, US Patent application number 62/741,049. (2018)

PEER REVIEW ACTIVITY

- *Bioresource Technology*
- *RSC Advances*

RESEARCH PRESENTATIONS

- J.G. Lee and B. Bharti *et al.*, “3D Printing and Microbial Degradation of Lignin-Zein Composite”, (2021, June). Presented at the 95th ACS Colloid & Surface Science Symposium.
- J.G. Lee and B. Bharti *et al.*, “Fabrication and Active Propulsion of Patchy Ellipsoidal Microparticles in Electric Field”, (2021, June). Presented at the 95th ACS Colloid & Surface Science Symposium.
- J.G. Lee and B. Bharti *et al.*, “Adsorption of myoglobin on silica nanoparticles and corona formation”, (2020, November). Presented at the 2020 Virtual AIChE Annual Meeting
- J.G. Lee and B. Bharti, “Sustainable future with plant-based ecofriendly materials”, (2020, October) Presented at the LSU Cain Department of Chemical Engineering Seminar
- J.G. Lee and B. Bharti, “Non-linear propulsion of active colloids”, Presented at the 2020 Virtual ACS Colloids& Surface Science Symposium.
- J.G. Lee and B. Bharti *et al.*, “Disordering colloidal crystal and directing structural color”, (2020, February). Presented at Colloidal, Macromolecular and Polyelectrolyte Solutions Gordon Research Conference. Ventura, CA
- J.G. Lee and B. Bharti *et al.*, “Overwriting coffee-ring effect with magnetostatic convection”, (2019, November). Presented at the 2019 AIChE Annual Meeting. Orlando, FL
- J.G. Lee and B. Bharti *et al.*, “Understanding the cooperative adsorption of globular protein”, (2019, November). Presented at the 2019 AIChE Annual Meeting. Orlando, FL

- J.G. Lee and B. Bharti *et al.*, “Binding of lignin nanoparticles at oil-water interfaces: an ecofriendly alternative to oil spill recovery”, (2019, June). Presented at the 93th ACS Colloid & Surface Science Symposium Langmuir Student Award Sessions. Atlanta, GA
- J.G. Lee and B. Bharti *et al.*, “Directed propulsion of spherical particles along 3D helical trajectories using induced-charge electrophoresis”, (2019, June). Presented at the 93th ACS Colloid & Surface Science Symposium. Atlanta, GA
- J.G. Lee and B. Bharti *et al.*, “Finding lignin-based dispersants for large-scale oil spill management: From biopolymer to ecofriendly nanoparticles”, (2018, November). Presented at the 6th Annual Applied Polymer Technology Extension Consortium Symposium. Hammond, LA
- J.G. Lee and B. Bharti *et al.*, “Binding of lignin nanoparticles at oil-water interface: Ecofriendly approach to oil spill cleanup”, (2018, June). Presented at the 92nd ACS Colloid & Surface Science Symposium. State College, PA
- J.G. Lee and B. Bharti *et al.*, “Directed Assembly and reconfiguration of high-energy colloidal structures.”, (2018, June). Presented at the 92nd ACS Colloid & Surface Science Symposium. State College, PA
- J.G. Lee and B. Bharti *et al.*, “Finding new eco-friendly dispersants for oil-spill remediation: Lignin based solutions for oil-herding”, (2018, March). Presented at the 255th ACS National Meeting. New Orleans, LA
- J.G. Lee and B. Bharti *et al.*, “Programing the microdynamics of an active particle: From linear to helical trajectories”, (2018, March). Presented at the 255th ACS National Meeting. New Orleans, LA

TEACHING EXPERIENCE AND STUDENT MENTORSHIP

- **Graduate Teaching Assistant**

Transport Sciences: Heat and Mass Transfer (CHE 3102)

Spring 2017

Chemical Engineering Thermodynamics (CHE 3172)

Fall 2016

- **Student Mentoring**

Nathan Holley Louisiana State University

2018-present

Nathaniel Anderson Louisiana State University

2018-2020

Aubry Hymel Louisiana State University

2018-2020

Lauren Spahn Michigan Technological University (Summer REU)

Summer 2019

Kelly Lannigan Bucknell University (Summer REU)

Summer 2018

Luke Larive Louisiana State University

2018-2019

Maggie Lynch St. Joseph’s Academy

2018

Vanel Porter University of Louisiana at Lafayette (Summer REU)

Summer 2017

OUTREACH

- **ENGage LSU** Louisiana State University, Baton Rouge, LA

2017-2019

WORK EXPERIENCE

Republic of Korea Army, Gyeryong, Republic of Korea

December 2009 – September 2011