Yalin Li

Postdoctoral Research Associate

Institute for Sustainability, Energy, and Environment (iSEE)
Center for Advanced Bioenergy and Bioproducts Innovation (CABBI)
University of Illinois at Urbana-Champaign (UIUC)
1206 W. Gregory Drive | Urbana, IL 61801 | United States
Phone: +1 (217) 418-4672 | Email: yalinli2@illinois.edu | GitHub: @yalinli2

RESEARCH THEME

Advancing the sustainability of engineered systems through experimentation and quantitative sustainable design (QSD):

- Renewable products from wastes and biomass through thermochemical, physicochemical, biological, and catalytic technologies.
- Integration of experimentation, process modeling, techno-economic analysis (TEA), and life cycle assessment (LCA).
- Development and application of open-source tools for robust, rapid, and agile process design, system simulation, and sustainability characterization under uncertainty.

EDUCATION

Ph.D. (2019). Environmental Engineering. Colorado School of Mines (CSM), CO, USA.
Dissertation: Valorization of Wastewater-derived Biomass via Integrated Aqueous Systems.
Advisor: Timothy Strathmann
Best Thesis Awardee & Student Speaker at the Graduate Commencement.
M.S. (2015). Environmental Engineering. UIUC, IL, USA.
B.Eng. (2014). Environmental Engineering. Tongji University, Shanghai, China.

AWARDS & HONORS

2021, Presenter Travel Grant, *International Conference on Resource Sustainability (icRS)*.
2019, Dr. Bhakta and Sushama Rath Research Award (best doctoral thesis with potential for the greatest domestic societal impact), CSM.
2019, C. Ellen Gonter Environmental Chemistry Award (highest quality graduate student research papers), American Chemical Society (ACS) Division of Environmental Chemistry.
2018, Graduate Service Fellowship, ACS Division of Environmental Chemistry.
2018, Graduate Student Award, ACS Division of Environmental Chemistry.
2017, Best Poster Award, Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, Ann Arbor, MI, USA.
2017, Academic Scholarship, Colorado Environmental Management Society.
2016, Rosenthal Memorial Award, The Algae Foundation.
2016, Best Presentation Award, Y. Li and T. J. Strathmann, Symposium on "Chemistry of Biomass Wastes Conversion to Energy & Chemicals," 252nd ACS National Meeting & Exposition, Philadelphia, PA, USA.
2016, Travel Award, USA-UK STREAM Challenge Week Program, Industrial Doctorate Centre for the UK Water Sector and Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt).
2011-2013, National Undergraduate Innovation Program (China). Project Title: Photocatalytic Removal of Aqueous Endocrine Disruptors by Nano TiO_2/Diatomite.

PUBLICATIONS

Peer-Reviewed Papers

12. S. Leow, A. J. Koehler, L. E. Cronmiller, X. Huo, G. D. Lahti, **Y. Li**, G. R. Hafenstine, D. R. Vardon, and T. J. Strathmann. Vapor-Phase Catalytic Conversion of Aqueous 3-Hydroxybutyric Acid and Crotonic Acid to Propylene. *Catal. Sci. Technol.* **2021**. https://doi.org/10.1039/D1CY01152A.
11. Bradley, **Y. Li**, and J. S. Guest. Solids Residence Time Impacts Carbon Dynamics and Bioenergy Feedstock Potential in Phototrophic Wastewater Treatment Systems. *Environ. Sci. Technol.* **2021**, *55* (18), 12574–12584.
10. X. Yao, T. J. Strathmann, **Y. Li**, L. E.Cronmiller, H. Ma, and J. Zhang. Catalytic Hydrothermal Deoxygenation of Lipids and Fatty Acids to Diesel-like Hydrocarbons: A Review. *Green Chem.*, **2021**, *23* (3), 1114–1129.
9. **Y. Li**, S. Bhagwat, Y. Cortés-Peña, D. Ki, C. V. Rao, Y.-S. Jin, and J. S. Guest. Sustainable Lactic Acid Production from Lignocellulosic Biomass. *ACS Sustainable Chem. Eng.* **2021**, *9* (3), 1341–1351.
8. J. Yu, A. Nickerson, **Y. Li**, Y. Fang, and T. J. Strathmann. Fate of Per- and Polyfluoroalkyl Substances (PFAS) during Hydrothermal Liquefaction of Municipal Wastewater Treatment Sludge. *Environ. Sci.: Water Res. Technol.* **2020**, *6* (5), 1388–1399.
7. **Y. Li** and T. J. Strathmann. Kinetics and Mechanism for Hydrothermal Conversion of Polyhydroxybutyrate (PHB) for Wastewater Valorization. *Green Chem.*, **2019**, *21* (20), 5586–5597.
6. J. Zhang, X. Huo, **Y. Li**, and T. J. Strathmann. Catalytic Hydrothermal Decarboxylation and Cracking of Fatty Acids and Lipids over Ru/C. *ACS Sustainable Chem. Eng.*, **2019**, *7* (17), 14400–14410.
5. **Y. Li,** S. A. Slouka, S. M. Henkanatte-Gedera, N. Nirmalakhandan, and T. J. Strathmann. Seasonal Treatment and Economic Evaluation of an Algal Wastewater System for Energy and Nutrient Recovery. *Environ. Sci.: Water Res. Technol.*, **2019**, *5* (9), 1545–1557.
4. **Y. Li**, S. Leow, T. Dong, N. J. Nagle, E. P. Knoshaug, L. M. L., Laurens, P. T. Pienkos, J. S. Guest, and T. J. Strathmann. Demonstration and Evaluation of Hybrid Microalgae Aqueous Conversion Systems for Biofuel Production. *ACS Sustainable Chem. Eng.*, **2019**, *7* (6), 5835-5844.
3. S. Leow, B. D. Shoener, **Y. Li**, J. L. DeBellis, J. Markham, R. Davis, L. M. L. Laurens, P. T. Pienkos, S. M. Cook, T. J. Strathmann, and J. S. Guest. A Unified Modeling Framework to Advance Biofuel Production from Microalgae. *Environ. Sci. Technol.*, **2018**, *52* (22), 13591-13599.
2. **Y. Li**, W. A. Tarpeh, K. L. Nelson, and T. J. Strathmann. Quantitative Evaluation of an Integrated System for Valorization of Wastewater Algae as Bio-Oil, Fuel Gas, and Fertilizer Products. *Environ. Sci. Technol.*, **2018**, *52* (21), 12717-12727.
1. **Y. Li**, S. Leow, A. C. Fedders, B. K. Sharma, J. S. Guest, and T. J. Strathmann. Quantitative Multiphase Model for Hydrothermal Liquefaction of Algal Biomass. *Green Chem.*, **2017**, *19* (4), 1163-1174.

Manuscripts in Review or Revision

4. **Y. Li**, J. T. Trimmer, S. Hand, X. Zhang, K. G. Chambers, H. A. C. Lohman, R. Shi, D. M. Byrne, S. M. Cook, and J. S. Guest. Quantitative Sustainable Design (QSD): Critical Review and Methodology for the Prioritization of Technology Research, Development, and Deployment. *Critical Review Proposal Submitted.*

3. S. S. Bhagwat, **Y. Li**, Y. R. Cortés-Peña, E. C. Brace, T. A. Martin, H. Zhao, and J. S. Guest. Sustainable Production of Acrylic Acid via 3-Hydroxypropionic Acid from Lignocellulosic Biomass. *Submitted.*
2. X. Yao, **Y. Li**, H. Ma, D. Zeng, J. Zhang, and T. J. Strathmann. Catalytic Hydrothermal Deoxygenation of Stearic Acid with Ru/C: The Effect of Alcohol- and Carboxylic Acid-Based Hydrogen Donors. *Submitted.*
1. D. Zeng, **Y. Li**, H. Ma, F. Cui, and J. Zhang. Core-Shell CuO@NiO Nanoparticles Derived from Metalorganic Framework Precursor for Deoxygenation of Fatty Acids. *Submitted.*

Manuscripts in Preparation (available upon request)

1. **Y. Li**, X. Zhang, L. S. Rowles, V. L. Morgan, H. A. C. Lohman, S. Mittal, A. Kogler, W. A. Tarpeh, and J. S. Guest. QSDsan: An Integrated Platform for Quantitative Sustainable Design of Sanitation and Resource Recovery Systems under Uncertainty. *In Prep.*

Public Media

1. **Y. Li**, Wastewater is an asset – it contains nutrients, energy and precious metals, and scientists are learning how to recover them. *The Conversation*, Mar 19, 2019.

OPEN-SOURCE TOOLS

Lead developer/maintainer for:

- **QSDsan:** Quantitative sustainable design of sanitation and resource recovery systems
  GitHub: https://github.com/QSD-Group/QSDsan
  documentation: https://qsdsan.readthedocs.io
  YouTube video tutorial:
  https://www.youtube.com/playlist?list=PL-tj_uM0mIdFv72MAULnWjS6lx_cCyi2N
- **EXPOsan:** EXPOsition of sanitation and resource recovery systems
  GitHub: https://github.com/QSD-Group/EXPOsan
- **QSDedu:** Education modules for quantitative sustainable design
  GitHub: https://github.com/QSD-Group/QSDedu
- **BW2QSD:** BW2QSD: Bridging Brightway2 and QSD packages for LCA
  GitHub: https://github.com/QSD-Group/BW2QSD
- **DMsan:** Decision-making for sanitation and resource recovery systems
  GitHub: https://github.com/QSD-Group/DMsan

Core contributor for:

- **BioSTEAM:** Biorefinery simulation and techno-economic analysis modules
  GitHub: https://github.com/BioSTEAMDevelopmentGroup/biosteam
  documentation: https://biosteam.readthedocs.io
- **Thermosteam:** BioSTEAM's premier thermodynamic engine
  GitHub: https://github.com/BioSTEAMDevelopmentGroup/thermosteam
  documentation: https://thermosteam.readthedocs.io/
- **Bioindustrial-Park:** BioSTEAM's premier biorefinery models and results
  GitHub: https://github.com/BioSTEAMDevelopmentGroup/Bioindustrial-Park

SELECT CONFERENCE PRESENTATIONS (presenter underlined)

Y. Li, X. Zhang, L. S. Rowles, V. L. Morgan, H. A. C. Lohman, S. Mittal, A. Kogler, S. E. Aguiar, W. A. Tarpeh, R. D. Cusick2, J. S. Guest. An Integrated Platform for Quantitative Sustainable Design of Sanitation and Resource Recovery Systems under Uncertainty. (Poster) *IWA Water Resources Recovery Modelling Conference (Virtual).* August 21-25, 2021.

Y. Li, G. A. Kontos, N. Avila, D. V. Cabrera, M. Viswanathan, V. Singh, R. A. Labatut, and J. S. Guest. Design of a Small-footprint Wastewater Treatment and Energy Recovery Process for Biorefineries. *International Conference on Resource Sustainability (Virtual)*, July 19-23, 2021.

Y. Li. Advancing the Sustainability of Engineered Systems through Experimentation and Quantitative Sustainable Design (QSD). *AEESP AJAR Future Faculty Seminar Series (Virtual, Invited)*. March 12, 2021.

Y. Li, S. S. Bhagwat, Y. Cortes-Peña, D. Ki, C. V. Rao, Y.-S. Jin, and J. S. Guest, Sustainable Lactic Acid Production from Lignocellulosic Biomass. *2nd Bioenergy Sustainability Conference (Virtual)*, October 13-15, 2020.

Y. Li, S. S. Bhagwat, Y. Cortes-Peña, D. Ki, C. V. Rao, Y.-S. Jin, and J. S. Guest, Evaluating the Sustainability of Lactic Acid Production from Lignocellulosic Biomass. *ACS Fall 2020 Virtual Meeting & Expo*, August 17-20, 2020.

Y. Li and J.S. Guest. Navigating Tradeoffs in Design of Pretreatment Strategies for Lignocellulosic Biomass of Varying Composition. *Bioenergy Sustainability Conference*, Nashville, TN, USA, October 21-22, 2019.

Y. Li, S. Leow, T. Dong, L.M.L. Laurens, P.T. Pienkos, J.S. Guest, and T.J. Strathmann. Demonstration and Evaluation of Integrated Microalgae Systems for Biofuel Production (Invited Talk for Gonter Award). *258th ACS National Meeting & Exposition*, San Diego, CA, USA, August 25-29, 2019.

Y. Li, D. R. Vardon, and T. J. Strathmann. Advancing Resource Recovery from Wastewater: Part 2 – Hydrothermal Conversion of Polyhydroxybutyrate (PHB)-Containing Biomass (Poster). *AEESP Research and Education Conference*. Arizona State University, Tempe, AZ, USA, May 14-16, 2019.

Y. Li, S. Leow, W. A. Tarpeh, T. Dong, N. J. Nagle, E. P. Knoshaug, L. M. L. Laurens, P. Tienkos, K. L. Nelson, J. S. Guest, and T. J. Strathmann (Poster). Advancing Resource Recovery from Wastewater: Part 1 – Aqueous Conversion Processes for Algal Biomass. *AEESP Research and Education Conference*. Arizona State University, Tempe, AZ, USA, May 14-16, 2019.

Y. Li, S. Leow, T. Dong, L. M. L. Laurens, P. T. Pienkos, J. S. Guest, and T. J. Strathmann. Demonstration and Evaluation of Integrated Microalgae Systems for Biofuel Production (Oral and Poster). *256th ACS National Meeting & Exposition*, Boston, MA, USA, August 19-23, 2018.

Y. Li, W. Tarpeh, K. L. Nelson, and T. J. Strathmann. Complete Valorization of Wastewater Algae via an Integrated Thermo- and Electrochemical Processing Strategy (Oral). *256th ACS National Meeting & Exposition*, Boston, MA, USA, August 19-23, 2018.

Y. Li, W. Tarpeh, K. L. Nelson, and T. J. Strathmann. Energy and Nutrient Recovery from Hydrothermal Process Co-products (Oral). *256th ACS National Meeting & Exposition*, Boston, MA, USA, August 19-23, 2018.

Y. Li, S. A. Slouka, S. M. Henkanatte-Gedera, N. Nirmalakhandan, W. A. Tarpeh, K. L. Nelson, and T. J. Strathmann. Re-inventing Wastewater Treatment Systems (Student Spotlight Oral Presentation). *2018 ReNUWIt Annual Meeting*, Stanford, CA, USA, May 23, 2018.

SELECT CONFERENCE PRESENTATIONS (cont'd)

Y. Li, S. A. Slouka, S. M. Henkanatte-Gedera, N. Nirmalakhandan, W. A. Tarpeh, K. L. Nelson, and T. J. Strathmann. Transformation of Wastewater Treatment: Energy and Nutrient Recovery from Municipal Wastewater (Oral). *15th RMSAWWA/RMWEA Joint Student Conference*, Golden, CO, USA, May 14, 2018.

Y. Li, T. J. Strathmann, S. Leow, N. Nirmalakhandan, W. A. Tarpeh, J. S. Guest, and D. R. Vardon. Integrated Bio-Hydrothermal-Catalytic Pathways for Optimum Conversion of Algal Biomass and Wastewater Biosolids to Liquid Transportation Fuels (Invited Talk). *9th National Conference on Environmental Chemistry*, Hangzhou, China, October 19-22, 2017.

Y. Li, S. A. Slouka, S. M. Henkanatte-Gedera, N. Nirmalakhandan, and T. J. Strathmann. Transformation of Wastewater Treatment – Energy and Nutrient Recovery from Municipal Wastewater (Oral). *Student Paper Night of Colorado Scientific Society*, Golden, CO, USA, September 21, 2017.

Y. Li, S. Leow, A. C. Fedders, J. S. Guest, and T. J. Strathmann. Quantitative Evaluation of Hydrothermal Liquefaction for Algal Biomass Valorization (Poster). *AEESP Research and Education Conference*, Ann Arbor, MI, USA, June 20-22, 2017.

Y. Li, S. Leow, J. S. Guest, and T. J. Strathmann. Hydrothermal Liquefaction for Biomass Valorization (Invited Talk). ENN Group, Langfang, Hebei, China, February 7, 2017.

Y. Li, S. Leow, A. C. Fedders, B. K. Sharma, J. S. Guest, T. Dong, N. J. Nagle, P. T. Pienkos, and T. J. Strathmann. A Comprehensive Model for Hydrothermal Liquefaction (HTL) of Microalgae (Oral and Poster). *10th Algae Biomass Summit*, Phoenix, Arizona, USA, October 23-26, 2016.

Y. Li, S. Leow, A. C. Fedders, B. K. Sharma, J. S. Guest, T. Dong, N. J. Nagle, P. T. Pienkos, and T. J. Strathmann. Quantitative prediction of microalgae hydrothermal liquefaction (Oral). *252nd American Chemical Society (ACS) National Meeting & Exposition*, Philadelphia, PA, USA, August 21-25, 2016.

Y. Li, S. Leow, J. S. Guest, and T. J. Strathmann. A Quantitative Multiphase Component Additivity Model for Hydrothermal Liquefaction of Microalgae (Poster). *STREAM (Skills, Technology, Research and Management) Challenge Week*, Torquay, UK, July 10-15, 2016.

GRANT APPLICATIONS (lead and contributed to)

2021 ***Awarded (as PI)*** **Connecting Modeling Platforms to Enable High-resolution Field-to-Gate Analysis of Economic and Environmental Sustainability of Bioenergy and Bioproducts.**

CABBI Director's Fund, $140 K

*PI: **Yalin Li**; Jeremy Guest (UIUC, USA)*

Role: The lead PI responsible for proposal preparation and project management, including initiating and coordinating research between four groups (UIUC, West Virginia University, University of Idaho, Oak Ridge National Laboratory).

2020 ***Awarded*** **Process Optimization and Real-Time Control for Synergistic Microalgae Cultivation and Wastewater Treatment.**

Department of Energy, $2 MM

PI: Jeremy Guest (UIUC, USA)

Role: Conducted preliminary TEA, generated figures, and wrote corresponding proposal sections; coordinated with collaborators at Northeastern University and University at Buffalo, SUNY; provided technical inputs and edited proposal.

2019 ***Awarded*** **Hydrothermal Destruction and Modeling of Per- and Polyfluoroalkyl Substances (PFAS) of Sewer Sludge.**
National Natural Science Foundation of China, $90 K
PI: Jie Yu (Ningbo University, China); ***Y.L. listed as a key participant***
Role: Inspired research idea and established modeling method; provided technical input and edited proposal.

2018 ***Not Funded*** **Accelerating Development of Biogas-Utilizing Microorganisms for Tunable Hydroxyalkanoates and Flexible Production of Fuels and Chemicals.**
Department of Energy, $2.5 MM
PI: Timothy Strathmann (CSM, USA)
Role: Envisioned research idea; drafted majority of technical volume and prepared other technical materials; provided preliminary experimental data and facilitated preliminary TEA; coordinated between five research groups (two from CSM, two from NREL, and one industry partner), and drafted response to comments.

2018 ***Awarded*** **Hydrothermal Catalytic Conversion of Waste Lipids to Green Diesel and Its Life Cycle Analyses.**
National Natural Science Foundation of China, $90 K
PI: Jing Zhang (Chongqing University, China)
Role: Provided technical input and edited proposal.

2017 ***Awarded*** **From Wastewater to Gasoline – Aqueous Biorefining of Polyhydroxybutyrate (PHB)-Enriched Biosolids.**
National Science Foundation, $330 K
PI: Timothy Strathmann (CSM, USA)
Role: Generated preliminary data, wrote project summary and technical sections.

RESEARCH EXPERIENCES

2019-Present, Postdoctoral Research Associate, UIUC/CABBI.
Advisor: Jeremy Guest
Development and application of computational platform to integrate process modeling with TEA/LCA for sustainable design of biorefineries; development of tools and modules for resource recovery and wastewater treatment.

2017-2019, Visiting Researcher, National Renewable Energy Laboratory (NREL).
Advisor: Derek Vardon
Designed and experimentally demonstrated hybrid systems for producing algal biofuels; investigated an integrated catalytic hydrothermal pathway to convert waste organic carbon streams into biofuels.

2015-2019, Research Assistant, CSM/ReNUWIt Engineering Research Center.
Advisor: Timothy Strathmann
Experimental conversion and economic analysis of aqueous technologies and systems for resource recovery from wastewater through biomass (e.g., algae and polyhydroxybutyric (PHB)-producing bacteria).

2014-2015, Graduate Research Assistant, UIUC.
Advisor: Timothy Strathmann

Conducted hydrothermal conversion of algal biomass and analytical characterization of feedstock and products; established quantitative correlations between algal feedstock and products.

2014, Undergraduate Research Assistant, UIUC.
Advisor: Timothy Strathmann

Participated in a Research Experience for Undergraduate (REU) project to investigate deactivation and regeneration of immobilized thin film TiO_2 during treatment of trace pharmaceutical pollutants in groundwater.

2011-2014, Undergraduate Research Group Leader, Tongji University.
Advisor: Bingzhi Dong

Led an undergraduate research team to investigate the use of nano TiO_2-diatomite composite for photocatalytic treatment of natural organic matter.

TEACHING & MENTORING EXPERIENCES

Course Instruction

2020, ENVS 301 Tools for Sustainability (UIUC). Guest lecture on life cycle assessment.

2019, CEE 443 Environmental Engineering Principles, Chemical (UIUC). Developed and instructed course modules on Redox Chemistry and Sorption Processes; wrote homework and exam problems; proctored and graded the final exam.

2019, CEE 437 Water Quality Engineering; CEE 443 Environmental Engineering Principles, Chemical (UIUC). Class tours to water and wastewater treatment plants.

2018, CEEN 470/570 Water and Wastewater Treatment (CSM). Guest lecture on overview of water and wastewater treatment processes.

Teaching Assistant

2015-2018, CEEN 470/570 Water and Wastewater Treatment; CEEN 550 Principles of Environmental Chemistry (CSM). Held office hour, graded assignments and examines.

Graduate and Undergraduate Mentoring

2021-Present, Connecting Modeling Platforms for High-Resolution Field-to-Gate Techno-economic Analysis and Life Cycle Assessment (TEA/LCA) of Bioenergy and Bioproducts. Mentoring one graduate student on establishing an integration framework to connect different modeling platforms for sustainability analysis of the in-field, on-road, and at-plant sectors along bioenergy and bioproduct value chain.

2020-Present, Sustainable Bioproducts from Lignocellulosic Biorefineries. Mentoring a graduate student on using TEA/LCA for the design of lignocellulosic biorefineries for second-generation bioproducts (3-hydroxypropionic acid, triacetic acid lactone, and 2,3-butanediol), which include several collaborative projects with chemical and biomolecular engineering researchers from multiple universities.

2020-2021, Design of Internal Circulation Reactors for Energy Recovery from Biorefineries. Mentored a graduate and an undergraduate student on using small-footprint anaerobic internal circulation reactors for treatment of high-strength wastewater from biorefineries with simultaneous resource recovery.

2018-2019, Catalytic Dehydration and Decarboxylation of Polyhydroxybutyrate Acid Monomers to Propylene. Mentored a graduate student on: (i) hydrothermal catalytic reaction design and aqueous (HPLC) and organic/gas (GC) product analyses, (ii) continuous reactor construction, operation and maintenance, and (iii) I/O module controlling and program coding.

2018, Hydrothermal Depolymerization of Polyhydroxybutyrate. Mentored a ReNUWIt REU student on reactor construction, reaction design, and product analyses.

2016-2017, Hydrothermal Conversion of Waste Biomass. Mentored two undergraduate students on reactor construction and reaction design for resource recovery from waste biomass.

PROFESSIONAL ACTIVITIES

Journal Review

Environmental Science:
Environmental Science & Technology; *Water Research*

Renewable Products:
Applied Energy; *ACS Sustainable Chemistry & Engineering*; *Biotechnology Reports*; *Bioresource Technology*; *Energy & Fuels; Sustainable Energy & Fuels*

Service

***Lead Organizer*, ACS Division of Environmental Chemistry (2020).** Leading the organization of symposium *Sustainable Technologies for a Circular Economy: From Benchtop Experimentation through System Analyses* at Fall 2020 ACS National Meeting & Exposition.

***Participant*, Application for 2021 AEESP Research and Education Conference (2019).** Drafted the section of conference venue for the preproposal to host the conference.

***Service Fellow*, ACS Division of Environmental Chemistry (2018).** Facilitate the organization of division activities at Fall 2018 ACS National Meeting & Exposition and prepared materials to solicit award sponsors.

***Reviewer*, ReNUWIt REU Application (2018).**

***Graduate Advisor*, Research Experience for Teachers (2016-2018).** Presented hydrothermal technologies, demonstrated water quality analyses, and provided suggestions on course design to K-12 teachers.

Mentoring

***Mentor*, Research Internship in Sustainable Bioenergy (2021).** Selected by CABBI to participate as a mentor for a 10-week summer research program targeting underrepresented groups.

***Participant*, ACS Mentor Training Workshop (2021).** Selected by ACS to participate in mentoring workshop to learn strategies on developing and improving mentoring skills as well as mentor-mentee relationships.

***Mentor*, Clean Water Science Network (2020-2021).** Mentoring undergraduate students from Latin America who are interested in water-related graduate programs and promoting scientific conversations about water.

***Panelist*, ReNUWIt Peer-Mentoring Training (2017).**

OUTREACH ACTIVITIES

Media ***Participant,*** **ComSciCon RMW (2018).** Attended the 2018 ComSciCon-Rocky Mountain West conference with a focus on science communication skills. The news story drafted during a workshop was published on *The Conversation*.

K-12 ***Presenter,*** **Math & Science Night at Shelton Elementary School (2018).** Ran the "Invisible Ink" activity to show oxidation of organic compounds at high temperature for K-6 students.

Mentor, **Project Based Learning Panelist at Bell Middle School (2017).** Provided feedback for 6th grade students on their engineering projects.

Organizer/Presenter, **Orange County Children's Water Education Festival (2017).** Co-organized and presented the City Stormwater Design Challenge Program by ReNUWIt. This two-day festival attracted more than 122,000 children in total, and 300-400 children participated in the ReNUWIt program.

Presenter, **Science & Engineering Fair Demonstration Night at Kyffin Elementary School (2016).** Demonstrated the water cycle and water/wastewater treatment processes with an EnviroScape model to K-12 students

Organizer/Instructor, **Girls' Adventures in Mathematics, Engineering, and Sciences at UIUC (2015).** Developed the learning program (course materials and experiment sessions) and instructed the "Renewable Energy-Biofuels" session for the high-school summer camp.