UNIVERSITY OF CONNECTICUT • DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
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BAIKUN LI

Dr. Baikun Li is the Centennial Professor of Environmental Engineering at the University of Connecticut (UConn). Dr. Li's research is in the multidisciplinary areas of bioenergy production from wastes, bioelectricity harvest from ocean sediment, and biosensors and bioelectronics. Current research focuses on water/soil electrochemical sensors, real time *in situ* water quality monitoring, and self-sustained wastewater treatment processes.

She is the Al Geib Professorship recipient 2013-2016, and was awarded the Woman of Innovation (Research Innovation and Leadership) in 2010 by the Connecticut Technology Council (CTC). In 2017, due to her outstanding achievement of bioenergy harvest and biosensor development, Dr. Li was inducted as the Member of Connecticut Academy of Science and Engineering (CASE).

Dr. Li has published over 180 peer-reviewed journal papers. Dr. Li has served as the Associate Editor for Environmental Research, Journal of Environmental Engineering (ASCE-JEE), CLEAN-Soil, Air, Water, and Journal of Air & Waste Management Association (JAWMA). Dr. Li's research has been supported by National Science Foundation (NSF), Environmental Protection Agency (EPA), Department of Defense (DoD), United State Geology Survey (USGS) and industrial partners, with the total fund about $8 million. Dr. Li has extensively supervised and mentored undergraduate and graduate student, including over 30 undergraduate researchers, 18 Master students, and 14 Ph.D students. Her "Bioenergy and Biosensor" group has hosted over 2500 visitors globally. In the meantime, Dr. Li has been dedicated in technology transformation with numerous industrial partners in the State of Connecticut.

EDUCATION

Postdoctoral Researcher, May 2002 to August 2003 — Advisor: Bruce Logan
Pennsylvania State University — State College, PA
Department of Civil and Environmental Engineering

Doctor of Philosophy, Environmental Engineering, May 2002 — Advisor: Paul Bishop
"Redox potential (ORP) Regulation of Nutrient Removal in Wastewater Treatment Processes and the Structure-function Analysis of Activated Sludge Flocs."
University of Cincinnati — Cincinnati, OH
Department of Civil and Environmental Engineering

Master of Engineering, Environmental Engineering, May 1995
Harbin Institute of Technology — Harbin, P.R. China
School of Environmental Engineering

Bachelor of Engineering, Environmental Engineering, May 1992
Harbin Institute of Technology — Harbin, P.R. China
School of Environmental Engineering

ACADEMIC APPOINTMENTS

University of Connecticut — Storrs, CT
Department of Civil and Environmental Engineering
Centennial SOE Term Professor August 2017-present
Professor, August 2016 – Present
Associate Professor, August 2011 – August 2016
Assistant Professor, August 2006 – August 2011

Pennsylvania state University, Harrisburg Campus — Middletown, PA
Environmental Engineering Program
Assistant Professor, August 2003 – August 2006

RESEARCH INTERESTS

Environmental Sensing Technology
Water Quality Engineering and Science
Environmental Biotechnology
Energy and Resource Recovery
Microbial Electrochemistry Technology
Food-Water-Energy Nexus.

PROFESSIONAL ENGINEER REGISTRATION

PE license (# 0028742, 2014)

PATENT

US Patent No: 15639852: Real-Time *In Situ* Sensing of Water-Related Parameters Using Milli-Electrode Array. **Baikun Li**, Yu Lei, Zhiheng Xu.

BOOK CHAPTERS

Wang, L., Cui, J., **Li, B.** "Marine sediment energy harvesting for sustainable underwater sensor networks," Rechargeable Sensor Networks: Technology, Theory and Application, World Scientific Publishing, 2014.

JOURNAL PUBLICATIONS (Selected out of over 160 peer-reviewed journal papers)

(Google Scholar Citation: > 6000, H-index: 46 as of 1/20/2020)

(G: Graduate student supervised; UG: Undergraduate student supervised;
VG: Visiting graduate students/scholars).

1. Huang, Y. [G], Wang, T. [G], Xu, Z. [G], Hughes, E. [UG], Qian, F., Lee, M. [UG], Fan, Y. [G], Lei, Y., Brückner, C., **Li, B.** (2019). Real-Time in Situ Monitoring of Nitrogen Dynamics in Wastewater Treatment Processes using Wireless, Solid-State, and Ion- Selective Membrane Sensors. *Environmental Science & Technology* 53 (6): 3140-3148.

2. Zhou, W. [G], Xu, Z. [G], Ross, D. [UG], Dignan, J., Fan, Y. [G], Huang, Y. [G], Wang, G., Bagtzoglou, A., Lei, Y., **Li, B.** (2019). Towards water-saving irrigation methodology: Field test of soil moisture profiling using flat thin mm-sized soil moisture sensors (MSMSs). *Sensors and Actuators B: Chemical* 298, 126857.

3. Xu, Z. [G], Dehkordy, F., Li, Y., Fan, Y. [G], Wang, T. [G], Huang, Y. [G], Zhou, W. [G], Dong, Q., Lei, Y., Stuber, M., Bagtzoglou, A., **Li, B.** (2019). High-fidelity profiling and modeling of heterogeneity in wastewater systems using milli-electrode array (MEA): Toward high-efficiency and energy-saving operation. *Water Research* 165: 114971.

4. Xu, Z. [G], Zhou, W. [G], Zhang, H. [G], Shen, M., Liu, Y. [VG], Cai, D. [UG], Li, Y. [G], Lei, Y., Wang, G., Bagtzoglou, A., **Li, B** (2018). Flat thin mm-sized soil moisture sensor (MSMS) fabricated by gold compact discs etching for real-time in situ profiling. *Sensors and Actuators B: Chemical* 255: 1166-1172.

5. Huang, Y. [G], Dehkordy, F., Li, Y. [G], Emadi, S., Bagtzoglou, A., **Li, B** (2018). Enhancing anaerobic fermentation performance through eccentrically stirred mixing: Experimental and modeling methodology. *Chemical Engineering Journal* 334: 1383-1391.

6. Xu, Z. [G], W Zhou, Y Li [G], Y Lei, A Bagtzoglou, Q Dong, D Cai [UG], **Li, B.** (2017). Flat flexible thin milli-electrode array for real-time in situ water quality monitoring in distribution systems. *Environmental Science: Water Research & Technology.* 3: 865-874.

7. Xu, Z. [G], W Zhou [G], H Zhang [G], M Shen, Y Liu, D Cai [UG], Y Li [G], Y Lei, G Wang, Amvrossios C Bagtzoglou, **Li, B.** (2017). Flat thin mm-sized soil moisture sensor fabricated by gold compact discs etching for real-time in situ profiling. *Sensors and Actuators B: Chemical.* 255:1166-1172.

8. Li, Y. [G], J Styczynski [UG], Y Huang [G], Z Xu [G], J McCutcheon, **Li, B.** (2017). Energy-positive wastewater treatment and desalination in an integrated microbial desalination cell (MDC)-microbial electrolysis cell (MEC). *Journal of Power Sources*. 356: 529-538.

9. Jia, F. [VG], Q Yang, X Liu, X Li, **Li, B.,** L Zhang, Y Peng (2017). Stratification of Extracellular Polymeric Substances (EPS) for Aggregated Anammox Microorganisms. *Environmental Science & Technology*. *51* (6):3260–3268.

Xu, Z. [G], Y Liu, I Williams [UG], Y Li [G], F Qian, L Wang, Y Lei, **Li, B.** (2017). Flat enzyme-based lactate biofuel cell integrated with power management system: Towards long term in situ power supply for wearable sensors. *Applied Energy* 194: 71-80

10. Xu, Z. [G], Q Dong, B Otieno, Y Liu, I Williams [UG], D Cai [UG], Y Li [G], Y Lei, **Li, B** (2016). Real-time *in situ* sensing of multiple water quality related parameters using micro-electrode array (MEA) fabricated by inkjet-printing technology (IPT). *Sensors and Actuators B: Chemical* 237: 1108-1119.

11. Xu, Z. [G], Liu, Y., Williams, I. [UG], Li, Y. [G], Qian, F., Zhang, H., Cai, D. [UG], Wang, L., **Li, B.** (2016). Disposable self-support paper-based multi-anode microbial fuel cell (PMMFC) integrated with power management system (PMS) as the real time "shock" biosensor for wastewater. *Biosensors and Bioelectronics* (85): 232-239.

12. Liu, B. [G], Williams, I., [UG], Li, Y. [G], Wang L., Bagtzoglou, A., McCutcheon, J., **Li, B**. (2016) Towards high power output of scaled-up benthic microbial fuel cells (BMFCs) using multiple electron collectors. *Biosensor & Bioelectronics.* 79: 435-441.

13. Li, Y. [G], Williams, I.[UG], Xu, Z. [G], Li, B., **Li, B.** (2016). Energy-positive nitrogen removal using the integrated short-cut nitrification and autotrophic denitrification microbial fuel cells (MFCs). *Applied Energy* 163: 352-360.

14. Xu, Z. [G], Liu, B. [G], Dong, Q., Lei, Y., Li, Y. [G], McCutcheon, J., **Li, B.** (2015), Membrane-based Microbial Fuel Cell Sensor for Self-*supported In Situ* On-Line Monitoring of Wastewater Shocks. *Bioresource Technology*. 197: 244-251 (**Featured on the Journal Cover**).

15. Gajda, I., Greenman,J., Melhuish,C., Santoro, C. [G], **Li, B.,** Cristiani, P., Ieropulos I. (2015). Electro-osmotic-based catholyte production by Microbial Fuel Cells. *Water Research.* 86: 108-115.

16. Li, Y. [G], Wu, Y., Liu, B. [G], Luan, H., Vadas, T., Guo, W., Ding, J., **Li, B.** (2015). Self-sustained reduction of multiple metals in a microbial fuel cell-microbial electrolysis cell hybrid system. *Bioresource Technology.* 192: 238-246.

17. Liu, B.[G], Weinstein, A. [UG], Kolln, M. [UG], Garrett, C. [UG], Wang, L., Bagtzoglou, A., Karra, U. [G], Li, Y. [G], **Li, B.** (2015). Distributed multiple-anodes benthic microbial fuel cell as reliable power source for subsea sensors. *Journal of Power Sources.* 286: 210-216.

18. Santoro C. [G], Babanova, S., Artyushkova, K., Atanassov, P., Greenman, J., Cristiani, P., Trasatti, S., Schuler, A., **Li, B.,** Ieropoulos, I., (2014). The effects of wastewater types on power generation and phosphorous removal of microbial fuel cells (MFCs) with activated carbon (AC) cathodes. *International Journal of Hydrogen Energy.* 39 (36): 21796-21802.

19. Liu, B. [G], Lei, Y., **Li, B** (2014). A batch-mode cube microbial fuel cell based "shock" biosensor for wastewater quality monitoring. *Biosensors and Bioelectronics*. 62:308-314.

20. Li, Y. [G], Wu. Y., Puranik, S. [G], Lei, Y, Vadas, T., **Li, B** (2014). Metals as electron acceptors in single-chamber microbial fuel cells. *Journal of Power Sources.* 269: 430-439.

21. Liu, B. [G], Bruckner, C., Lei, Y., Santoro, C. [G], **Li, B.**, (2014).Cobalt porphyrin-based material as methanol tolerant cathode in single chamber microbial fuel cells (SCMFCs). *Journal of Power Source.* 257: 246-253.

22. Santoro, C. [G], M. Guilizzoni, J.P. Correa Baena, U. Pasaogullari, A. Casalegno, **Li, B.,** S. Babanova, K. Artyuskova, Atanassov, P., (2014). The effects of carbon electrode surface properties on bacterial attachment and start up of microbial fuel cells (MFCs). *Carbon* 67: 128-139.

23. Karra, U. [G], Huang, G., Umaz, R., Tenaglier, C. [UG], Wang, L., **Li, B.** (2013). Stability characterization and modeling of robust distributed benthic microbial fuel cell (DBMFC) system. *Bioresource Technology*. 144: 477-484.

24. Manickam, S., Karra, U. [G], McCutcheon, J., **Li, B.** (2012). Activated Carbon Nanofiber Anodes for Microbial Fuel Cells. *Carbon.* 53 (19-28).

25. Santoro, C. [G], Lei, Y., Cristiani, P., U., **Li, B.** (2012). Power generation from wastewater using single chamber microbial fuel cells (MFCs) with platinum free cathodes and pre-colonized anodes. *Biochemical Engineering Journal*, 62: 8-16. **(<u>Top Cited Journal Paper Award</u>).**

26. Jiang, D. [G], Curtis, M., Troop, E., Scheible, K., McGrath J. [UG], Hu, B., Suib, S., Raymond D. [UG], **Li, B.** (2011). A pilot-scale study on utilizing multi-anode/cathode microbial fuel cells (MAC MFCs) to enhance the power production in wastewater treatment. *International Journal of Hydrogen Energy*. 36 (1): 876-884.

27. Sharma, Y. [G] and **Li, B.** (2010). The variation of power generation with organic substrates in single-chamber microbial fuel cells (SCMFCs). *Bioresource Technology* 101: 1844–1850.

28. Li, X. [G], Hu, B., Suib, B., Lei, Y. and **Li, B.** (2010). Manganese oxide as the new cathode catalyst in microbial fuel cell (MFC). *J. Power Sources.* 195(9):2586-2591.

HONORS &AWARDS

2017-2020 UConn School of Engineering Centennial Professorship

2017 First Place Award National Nitrogen Sensor Challenge, EPA

2017 Inducted to Connecticut Academy of Science and Engineering (CASE)

2013-2016 UConn CEE Department Al Geib Professorship

2012 UConn School of Engineering Best Graduate Advisor Award

2010 Connecticut Technology Council (CTC) Woman of the Year

AWARDS OF STUDENTS SUPERVISED **(Selected)**

2019 Yuankai Huang, Best Poster Award, New England Water Environmental Association (NEWEA), Boston, MA.

2018 Yuankai Huang, Best Poster Award (Environmental Engineering), School of Engineering (SOE) Poster Competition, University of Connecticut

2017 Zhiheng Xu, Outstanding Graduate Student, New England Water Environmental Association (NEWEA)

2016 Yan Li, Outstanding Graduate Student, New England Water Environmental Association (NEWEA)

2015 Bingchuan Liu, Best Poster Design Award, School of Engineering (SOE) Poster Competition, University of Connecticut

2013 Uday Karra. Outstanding Graduate Student (Environmental Engineering), New England Water Environmental Association (NEWEA)

2013 Carlo Santoro. Outstanding Doctorate Research Fellowship, National Society of Electrochemistry

2012 Nirav Patel. Outstanding Undergraduate Award (Environmental Engineering), New England Water Environmental Association (NEWEA)

2011 Windy Qiu. Best Undergraduate Presentation Presentation Award, The IEEE International Symposium on Circuits and Systems (ISCAS) Conference

2009 Yogesh Sharma. Best Poster Presentation Award, Water Environmental Federation (WEF-TEC) Annual Conference

2009 Yogesh Sharma. Outstanding Graduate Student Research Award, International Water Association (IAW) Northern America Annual Conference

STUDENTS

CURRENT PH.D. STUDENTS

Yuangkai Huang

Wangchi Zhou

Tianbao Wang

Xingyu Wang

Sanpreet Gill

Iram Sifat

Yingzheng Fan

GRADUATED PH.D. STUDENTS

Zhiheng Xu, May 2017 -- Research Scientist, UConn

Yan Li, December 2016 --Associate Professor, Jilin University, China

Bingchuan Liu, May 2015 -- Associate Professor, Huazhong University of Science and Technology

Uday Karra, May 2014 -- Engineer, Wright-Pierce Inc., CT

Carlo Santoro, August 2013 -- Associate Professor, University of West England, UK

Yogesh Sharma, August 2011 – Senior Quantitative Finance Manager,
Global Risk Analytics at Bank of America, NY

Daqian Jiang, June 2010 -- Assistant Professor, Montana Tech., MT

GRADUATED MASTER'S (MS) STUDENTS (WITH THESIS) AT UCONN

Wangchi Zhou, August 2018

Yan Li, May 2014

Daqian Jiang, May 2009

Secil Tutar, January 2015

Xiang Li, May 2011

GRADUATED PLAN B MASTERS STUDENTS (WITH RESEARCH REPORT) AT UCONN

Hui Zhang, December 2015

Kai, Zhang, May 2015

Yuan Feng, August 2013

Cheng Li, December 2015

Isaac Quansah, December 2014

Gina Krishnan, August 2012

GRADUATED MASTER'S (MS) STUDENTS (WITH THESIS) AT PENN STATE HARRISBURG

William Gaspari, May 2007

Benjamin Burns, December 2006

Howard Butler, May 2006

Kenneth Krach, May 2007

Jessica Mangus, May 2006

Shannon Irvin, May 2005

GRADUATE STUDENT COMMITTEES

Environmental Engineering (25 students) Chemical Engineering (12 students)

Chemistry (4 students) Material Science and Engineering (2 students)

UNDERGRADUATE STUDENT RESEARCHERS SUPERVISED **(Selected)**

Christos Bagtzoglou, 2018-2020, Undergraduate Researcher

Zoe Demitrack, 2018, NSF E-REU Student

Andrea Naranjo-Soledad, 2018-2019, Undergraduate Researcher

Danny Peterson, 2018-2019, Undergraduate Researcher

Alex Depasquale, 2018-2019, Undergraduate Researcher

Donald Curtiss, 2018, NSF REU Student

Meredith Lee, 2018, NSF E-REU Student

Emma Hughes, 2017-2018, UConn Honor Student

Linda Rivera, 2017-2018, Undergraduate Researcher

Priyanka Sonone, 2017-2018, Undergraduate Researcher

James Dignan, 2017, NSF E-REU Student

Danny Ross, 2017-2018, NSF REU Student and UConn Honor Student

Jessica Petritus, 2016-2017, UConn Honor Student

Dingyi Cai, 2015-2017, Undergraduate Researcher

Isiah Williams, 2015-2017, NSF REU Student and UConn Honor Student

Julia Garcez, 2015, Brazilian Exchange Undergraduate Student

Christine Roy, 2015, UConn Honor Student

Alyssa Weinstein, 2014, NSF REU Student

Caleb Erhard, 2014, NSF REU Student

Michal Kolln, 2013-2014, NSF REU Student

Eri Muto, 2013, NSF REU Student

Christian Boyden, 2013, UConn Honor Student

Larry Trestman, 2012, UConn Holster Outstanding Undergraduate Researcher

Chris Tenaglier, 2012, NSF REU Student

Nirev Patel, 2011, NSF REU Student and Undergraduate Researcher

Windy Qiu, 2011, Undergraduate Researcher

Mike Cremins, 2010, UConn Honor Student

James Mooradain, 2009, UConn Honor Student

Dan Raymond, 2008, UConn Honor Student

UNIVERSITY SERVICE

Chair, Graduate Admission Committee, CEE Department – (2011-2014, 2017-2019)

Department PTR Committee, CEE Department – (2011-2015, 2018-2021)

Ph.D Student Qualify Exam Question Committee, CEE Department – (2009, 2013, 2016-2018)

Course and Curriculum committee, CEE Department – (2007-2009, 2018-2019)

Eminent Energy Faculty Search Committee, School of Engineering – (2008-2010)

NU Chair Environmental Engineering Search Committee, CEE Department – (2008-2009)

Environmental Engineering Faculty Search Committee, CEE Department – (2008)

Chemical Engineering Faculty Search Committee, School of Engineering – (2009)

EXTRAMURAL SERVICE

Associate Editor: Environmental Research (2012-present)

Associate Editor: Journal of Air & Waste Management Association (2017-2020)

Guest Editor: Journal of Air & Waste Management Association: Special Issue: Energy and Resource Recovery from Waste (2018-present)

Associate Editor: Journal of Environmental Engineering (2012-present)

Associate Editor: CLEAN-Soil, Air, Water (2010-2017)

Energy Stability Committee, New England Water Environmental Association (NEWEA) (2016-present)

Coordinator, Environmental Chemistry Symposium, ACS Annual Conference (2010, 2012, 2014)

Chair of Poster Exhibition, Water Environment Federation (WEFTEC) Annual Conference (2008-2011)

Coordinator, Sustainable Energy Section, NSF Cyber-Physics System Conference, 2009

Coordinator, Bioenergy Production Section, ASME Annual Conference, 2008

Coordinator, Biodegradation Section, Mid-Atlantic Industrial and Hazardous Waste Conference, 2007

Reviewer for over 30 journals

Review Panelist for NSF, EPA and DOE

EDUCATIONAL OUTREACH ACTIVITIES

NSF E-REU and REU Site Mentor (Summer 2010-2020) *–Have supervised over numerous undergraduate students for STEM projects.*

AEESP Distinguished Lecturer Seminar Co-organizer (UConn 2015, Yale 2018) *–Have organized two successful grand events with attendance of 200 undergraduate/graduate students.*

Host and Lab Demonstrator for High School Girls in the Greater Hartford Region (2008, 2010, 2013, 2015, 2017 and 2018) *— Have hosted over 100 high school girls to promote water sustainability and energy sustainability in the State of Connecticut.*

Lecturer and Demonstration Leader for Explore Engineering (E2) Program (2013, 2015-2018) *– Have delivered lectures, seminars and lab demos for over 200 high school students in Connecticut.*

Lecturer and Demonstrator for Hartford High School Student Extracurricular Research Activities (2013, 2015 and 2018) *--Have supervised the extracurricular research for over 20 high school students.*

Lecturer and Lab Demonstrator for School of Engineering (SOE) Open House: (2012-2019) -- *Have hosted over 1500 high school students and parents.*

Host and Demonstrator for Numerous National and International Delegation Groups of Educational, Research, Industry and Commercialization (2010-present) -- *Have hosted over 400 professional visitors internationally to promote collaboration.*

Industrial Liaison with Numerous Industrial Partners (e.g. Cromaglass Co., SUEZ. Co. Fuss&O'Neill Inc., Quantum Biopower Inc., Infiltrator Water Technology Co., Pointwatch LLC.) (2005-present) – *Have collaborated for technology transformation with over 20 industrial partners in Connecticut.*

Judge for Highschool Student Science Fair at Connecticut Convention (2008, 2016) *–Discussed with over 100 high school students for scientific interests and discoveries.*

Lecturer and Demonstrator for Connecticut Technology Council (CTC) and UConn Technology Incubation Program (2014, 2016) --- *Presented the water sustainability and energy sustainability to over 100 professionals and technology officers in Connecticut.*

Demonstrator for NextGenCT Initiative Press Conference at the State Capitol (2014)*—Demonstrated the biomass energy recovery to over 300 attendances.*

Instructor for Summer Course "Environmental Biotechnology" at Addis Ababa University (2014) – *Taught graduate courses in Ethiopia and guided their research.*