

# Ting Wang

PhD Candidate

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## Education

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<b>Georgia Institute of Technology</b>	Atlanta, GA, USA
• Ph.D., Environmental Engineering	Expected May 2022
• M.S., Computational Science and Engineering	Expected May 2022
<b>Peking University, M.S., Environmental Science, Beijing, China</b>	June 2017
<b>East China Normal University, B.S., Environmental Science, Shanghai, China</b>	June 2014

## Research interests

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- Environmental nanotechnologies and nanomaterials
- Antimicrobial approaches and water disinfection
- Applications of lab-on-a-chip and microfluidics
- Drinking water and wastewater treatment
- Simulation, big data analysis, machine learning

## Research experience

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- **Application and mechanism study of nanotechnologies for water disinfection** 2017-now  
Advisor: Dr. Xing Xie, Georgia Institute of Technology
- 1) **Operando investigation of a novel antimicrobial nanotechnology**  
Developed a lab-on-a-chip platform with gold nanoneedles to conduct single-cell level antimicrobial mechanism investigation on locally enhanced electric field treatment.
- 2) **Nanosecond bacteria inactivation achieved by nano-electroporation**  
Achieved ultrafast (nanosecond) bacteria inactivation using on-chip nano-electroporation enabled by the lightning rod effect of gold nanoneedles.
- 3) **Lethal electroporation threshold determination**  
Developed a lab-on-a-chip to determine the electroporation threshold for bacteria inactivation.
- 4) **Using nanowire decorated electrodes for electrified water disinfection**  
Developed CuO and Cu<sub>3</sub>P nanowire decorated electrodes with TiO<sub>2</sub> coating achieved by atomic layer deposition for water disinfection.

- **Developing a novel flow battery with high volumetric power** 2020-2021  
Advisor: Dr. Xing Xie, Dr. Nian Liu, Georgia Institute of Technology  
Built a theoretical model to simulate a microtubular flow battery with high volumetric power.
- **Simultaneous removal of nitrogen, PPCPs, and pesticides from wastewater** 2014-2017  
Advisor: Dr. Weizhong Wu, Peking University
  - 1) Simultaneous removal of ammonia, nitrate and PPCPs (ibuprofen, triclosan, and nonylphenol) from wastewater using a solid-carbon denitrification system.
  - 2) Simultaneous nitrate and 4-chlorophenol removal using a solid-phase denitrification system.

### Publications (# Equal contribution, \* Corresponding author,)

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1. **Ting Wang**, Devin K. Brown, and Xing Xie\*. “Operando Investigation of Locally Enhanced Electric Field Treatment (LEEFT) Harnessing Lightning-Rod Effect for Rapid Bacteria Inactivation.” *Nano Letters*. 22 (2) (2022): 860-867
2. **Ting Wang**, Hang Chen, Cecilia Yu, and Xing Xie\*. “Rapid determination of the electroporation threshold for bacteria inactivation using a lab-on-a-chip platform.” *Environment international* 132 (2019): 105040.
3. Haimeng Sun<sup>#</sup>, **Ting Wang**<sup>#</sup>, Zhongchen Yang, Cecilia Yu, and Weizhong Wu\*. “Simultaneous removal of nitrogen and pharmaceutical and personal care products from the effluent of waste water treatment plants using aerated solid-phase denitrification system.” *Bioresource technology* 287 (2019): 121389.
4. **Ting Wang**, Xing Xie\*. “Ultrafast Bacteria Inactivation Achieved by Locally Enhanced Electric Field Treatment (LEEFT) With Nanosecond Pulses.” *To be submitted*.
5. Yutong Wu<sup>#</sup>, Fengyi Zhang<sup>#</sup>, **Ting Wang**<sup>#</sup>, Po-Wei Huang, Haochen Yang, Alexandros Filippas, Yanghang Huang, Panyiming Liu, Chihyun Hwang, Chao Wang, Huitian Liu, Xing Xie\*, Ryan P. Lively\* and Nian Liu\*, “A Co-Axial Microtubular Flow Battery with Ultra-High Volumetric Power.” *To be Submitted*.
6. Jianfeng Zhou, **Ting Wang**, and Xing Xie. “Locally Enhanced Electric Field Treatment (LEEFT) Promotes the Performance of Ozonation for Bacteria Inactivation by Disrupting the Cell Membrane.” *Environmental Science & Technology* 54.21 (2020): 14017-14025.
7. Tianqi Zhang, **Ting Wang**, Benjamin Mejia-Tickner, Jessica Kissel, Xing Xie, and Ching-Hua Huang. "Inactivation of Bacteria by Peracetic Acid Combined with Ultraviolet Irradiation: Mechanism and Optimization." *Environmental Science & Technology* 54, no. 15 (2020): 9652-9661.
8. Zeou Dou, **Ting Wang**, Wensi Chen, Beichen Lin, Hai Dong, Wei Sun, and Xing Xie. "Self-driven membrane filtration by core-shell polymer composites." *Journal of Materials Chemistry A* 8, no. 31 (2020): 15942-15950.

9. Wensi Chen, **Ting Wang**, Zeou Dou, and Xing Xie. "Self-Driven "Microfiltration" Enabled by Porous Superabsorbent Polymer (PSAP) Beads for Biofluid Specimen Processing and Storage." *ACS materials letters* 2, no. 11 (2020): 1545-1554.
10. Jianfeng Zhou, **Ting Wang**, Wensi Chen, Beichen Lin, and Xing Xie. "Emerging investigator series: locally enhanced electric field treatment (LEEFT) with nanowire-modified electrodes for water disinfection in pipes." *Environmental Science: Nano* 7, no. 2 (2020): 397-403.
11. Jianfeng Zhou, Cecilia Yu, **Ting Wang**, and Xing Xie. "Development of nanowire-modified electrodes applied in the locally enhanced electric field treatment (LEEFT) for water disinfection." *Journal of Materials Chemistry A* 8, no. 25 (2020): 12262-12277.
12. Jianfeng Zhou, **Ting Wang**, and Xing Xie\*. Rationally designed tubular coaxial-electrode copper ionization cells (CECICs) harnessing non-uniform electric field for efficient water disinfection. *Environment international* 128 (2019): 30-36.
13. Jianfeng Zhou, **Ting Wang**, Cecilia Yu, and Xing Xie. "Locally enhanced electric field treatment (LEEFT) for water disinfection." *Frontiers of Environmental Science & Engineering* 14 (2020): 1-12.
14. Wensi Chen, **Ting Wang**, Zeou Dou, and Xing Xie. "Self-Driven Pretreatment and Room-Temperature Storage of Water Samples for Virus Detection Using Enhanced Porous Superabsorbent Polymer Beads." *Environmental Science & Technology* (2021). Accepted
15. Wensi Chen, **Ting Wang**, Zeou Dou, and Xing Xie\*. "Microalgae Harvesting by Self-Driven 3D Microfiltration with Rationally-Designed Porous Superabsorbent Polymer (PSAP) Beads." *Environmental science & technology*. 55, no. 20 (2021): 14059-14068.
16. Peirui Liu, Jianfeng Zhou, **Ting Wang**, Cecilia Yu, Yu Hong, and Xing Xie. "Efficient microalgae inactivation and growth control by locally enhanced electric field treatment (LEEFT)." *Environmental Science: Nano* 7, no. 7 (2020): 2021-2031.
17. Wensi Chen, Jinyue Jiang, Wenlong Zhang, **Ting Wang**, Jianfeng Zhou, Ching-Hua Huang, and Xing Xie\*. Silver Nanowire-Modified Filter with Controllable Silver Ion Release for Point-of-Use Disinfection. *Environmental science & technology* 53, no. 13 (2019): 7504-7512.

## Book chapters

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1. **Ting Wang**, Cecilia Yu, Xing Xie\*. Microfluidics for environmental applications. *Advances in Biochemical Engineering/Biotechnology*. Springer, 2020

## Patents

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1. Jianfeng Zhou, Xing Xie, **Ting Wang**. Systems and Methods for Disinfecting Fluids. US Patent App. 17/266,678, 2021

## Presentations

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1. Operando Investigation of Locally Enhanced Electric Field Treatment (LEEFT) for Rapid Bacteria Inactivation, *Sustainable Nanotechnology Organization Conference*, Nov. 2021, Virtual, (Oral)
2. Operando Investigation of Locally Enhanced Electric Field Treatment (LEEFT) harnessing Lightning-Rod Effect for Rapid Bacteria Inactivation, *The American Chemical Society Fall 2021 National Meeting*, August 2021, Atlanta, GA, USA (Oral and Poster)
3. Operando Characterization of Locally Enhanced Electric Field Treatment (LEEFT) for Rapid Bacteria Inactivation, the 2021 Virtual CAPEES Student E-poster Competition, July 2021, Virtual. (Poster)
4. Rapid Bacteria Inactivation by Lightning Rod Effect in Nano-enhanced Electric-field Treatment, *The American Society of Microbiology (ASM) and Federation of European Microbiological Societies (FEMS) World Microbe Forum*, June 2021, Virtual. (Poster)
5. Nano-Enhanced Electric-Field Treatment (NEEFT) Harnessing Lightning-Rod Effect for Rapid Bacteria Inactivation, *The American Chemical Society Spring 2021 Meeting*, April 2021, Virtual. (Poster)
6. Lithography techniques and cleanroom tour. Guest lecture for Environmental Nanotechnology Course of Dr. Xing Xie in Georgia Tech. October 2020. (Oral).
7. Rapid Determination of the Electroporation Threshold for Bacteria Inactivation Using a Lab-on-a-Chip Platform, Institute for Electronics and Nanotechnology of Georgia Tech 2019 Meindl Lecture and User Day, September 2019, Atlanta, GA, USA. (Oral and poster)
8. Investigation of bacteria sensitivity to pulsed electric field electroporation using a lab-on-a-chip platform. *The 257<sup>th</sup> American Chemical Society National Meeting*, March 2019, Orlando, FL, USA. (Oral)
9. Synchronized nitrification and denitrification (SND) using PHBV as solid carbon source and the simultaneous removal of ibuprofen and triclosan, 2016 Korea-China-Japan Graduate Student Forum, June 2016, Daejeon, Korea. (Oral)

## Honors & Awards

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Nov. 2021	Student award, Sustainable Nanotechnology Organization (SNO)
Jul. 2021	Best Poster Presentation Award, 2021CAPEES Student E-poster Competition
Mar. 2019	Certificate of Merit for the first Oral Presentation at the 257th American Chemical Society National Meeting
Spring, 2018	2018 Georgia Tech Institute for Electronics and Nanotechnology Seed Grant (Supervised by Dr. Xing Xie)
2014-2017	Graduate student fellowship as a master student
Sept. 2012	First-class scholarship as outstanding undergraduate students

Sept. 2013                      First-class scholarship as outstanding undergraduate students

## **Internship and teaching assistant**

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### **Teaching assistant**

2021 Fall                      Environmental Nanotechnology at Georgia Tech

2015 Spring                      Environmental Biology Technology at Peking University

### **Internship**

Sept. 2013                      Shanghai Environmental Monitoring Center

Used GC-MS to analyze organics compounds (e.g., petroleum hydrocarbon) in surface water.

## **Skills**

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**Experimental skills:** MEMs and microfluidics fabrication: photo/e-beam lithography, e-beam evaporation, sputtering, ALD, etching, soft-lithography, etc.

Microbiology experimental skills: culturing, confocal microscopy, flow cytometry, PCR, etc.

Nanomaterial synthesis and characterization: SEM, EDS, XPS, etc.

Chemical analysis: HPLC, AAS, etc.

### **Programing and**

**software:**                      MATLAB, Python, COMSOL Multiphysics, AutoCAD

## **Journal reviewer**

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Journal of Water Process Engineering

## **Professional affiliations**

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American Chemical Society (ACS)

American Society of Microbiology (ASM)

Sustainable Nanotechnology Organization (SNO)