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Advanced Science Research Center (ASRC), City University of New York (CUNY) | Chemical Engineering, City College of New York (CCNY)
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CURRENT APPOINTMENTS

08/2023—present Associate Professor, Nanoscience Initiative, CUNY Advanced Science Research Center (ASRC), New York, NY

08/2023—present Associate Professor, Department of Chemical Engineering, City College of New York, New York, NY

08/2023—present Associate Professor, PhD Programs in Physics and Chemistry, The Graduate Center of the City University of New York, New York, NY

09/2017—08/2023 Assistant Professor, PhD Program in Physics, The Graduate Center of the City University of New York, New York, NY

07/2017—08/2023 Assistant Professor, PhD Program in Chemistry, The Graduate Center of the City University of New York, New York, NY

08/2016—08/2023 Assistant Professor, Department of Chemical Engineering, City College of New York, New York, NY

08/2016—08/2023 Assistant Professor, Nanoscience Initiative, CUNY Advanced Science Research Center (ASRC), New York, NY

EDUCATION

Columbia University, New York, NY
Postdoctoral Research Scientist in Biological Sciences and Physics; with Honors August, 2016

Stevens Institute of Technology, Hoboken, NJ
Ph.D. Nanotechnology in Mechanical Engineering; with Honors May, 2012

Tsinghua University, Beijing, China
M.S. in Precision Instruments in Mechanical Engineering July, 2007
B.S. in Mechanical Engineering; with Honors July, 2005

HONORS & AWARDS

National Science Foundation (NSF) Career Award 2023

The Science and Technology in Society (STS) forum Future Leaders, Kyoto, Japan 2023

The CUNY Academy Stefan Bernard Baumrin (SBB) Travel Award 2020

The Emerging Investigators, Journal of Materials Chemistry A 2020

The Feliks Gross Awards, CUNY Academy for the Humanities and Sciences 2018

The World Economic Forum Expert in Future of Energy and Water 2018

The Science and Technology in Society (STS) forum Future Leaders Program (one of four US young scientists to present the US), Kyoto, Japan 2017

CUNY Summer Undergraduate Research Program (CSURP) Mentor Award 2017

CUNY Faculty Travel Award, City University of New York 2017

Blavatnik Regional Awards for Young Scientists, New York Academy of Sciences, Finalist 2016

Five Year Service Award for the Siemens Competition in Math, Science & Technology 2016

Postdoctoral Research Symposium Award (5 out of 110), Columbia University 2015

James Harry Potter Award for outstanding PhDs, Stevens Institute of Technology 2012

Transducer Research Foundation (TRF) Student Award, IEEE MEMS, Paris, France 2012

National Science Foundation (NSF) Student Award, ASME IMECE, Denver, CO 2011

ASME Micro- and Nano-Systems (MNS) Photo Contest, 3rd Place, Washington, DC 2011

Fellowship of National Science Foundation (NSF) for APSS2010 (international summer school program in civil engineering) and 2nd place in final competition, University of Tokyo, Tokyo, Japan 2010

IEEE/NIST International Mobile Microrobotics Challenge, 3rd Place, Anchorage, Alaska 2010

Outstanding graduate paper award, Tsinghua University 2005

Challenge Cup of Science and Technology Production, 2nd Place, Tsinghua University 2005

Fellowship of National Instrument and Meter Association, Beijing 2003

Top Ten Association President Award, Tsinghua University 2003

PUBLICATIONS

Peer-reviewed journal articles

Dhwanit R. Dave, Salma Kassem, Maeva Coste, Lele Xu, Mona Tayarani-Najjaran, Darjan Podbevsek, Paola Colon-De Leon, Sheng Zhang, Luis Ortuno Macias, Deborah Sementa, María Pérez-Ferreiro, Nooshin Sadat Ayati, Muniyat A. Choudhury, Kelly Veerasammy, Selma Doganata, Tiffany Zhong, Cory Weng, Jorge Morales, Denize C. Favaro, Mateusz Marianski, So Yeon Ahn, Allie C. Obermeyer, Tong Wang, Tai-De Li, **Xi Chen**, Raymond Tu, Ye He and Rein V. Ulijn, Adaptive and Space-Filling Peptide Self-Assembly Upon Drying, *Nature Materials*, accepted.

Kübra Kaygisiz, Deborah Sementa, Vignesh Athiyarath, **Xi Chen** and Rein V. Ulijn. Context dependence in assembly code for supramolecular peptide materials and systems. *Nature Reviews Materials*, (2025).

Darjan Podbevšek, Yeojin Jung, Maheen K. Khan, Honghui Yu, Raymond S. Tu* and **Xi Chen***. The role of water mobility on water-responsive actuation of silk. *Nature Communications* **15**, 8287 (2024).

Avishek Dey*, Elma Naranjo, Ranajit Saha, Sheng Zhang, Maya Narayanan Nair, Tai-De Li, **Xi Chen***, and Rein V. Ulijn*. Water-Vapor Responsive Metallo-Peptide Nanofibers. *Angewandte Chemie International Edition* **63**, e202409391 (2024).

Jacob Kronenberg, Yeojin Jung, Jason Chen, Maria Jinu Kulapurathazhe, Dustin Britton, Seungri Kim, **Xi Chen***, Raymond S. Tu*, and Jin Kim Montclare*. Structure-Dependent Water Responsiveness of Protein Block Copolymers. *ACS Applied Bio Materials* **7**, 3714–3720 (2024).

Antonio R. Cerullo, Maxwell B. McDermott, Lauren E. Pepi, Zhi-Lun Liu, Diariou Barry, Sheng Zhang, Xu Yang, **Xi Chen**, Parastoo Azadi, Mande Holford, and Adam B. Braunschweig. Comparative mucomic analysis of three functionally distinct Cornu aspersum Secretions. *Nature Communications* **14**, 5361 (2023).

Steven G. Harrellson, Michael S. DeLay, **Xi Chen**, Ahmet-Hamdi Cavusoglu, Jonathan Dworkin, Howard A. Stone, and Ozgur Sahin. Hydration solids. *Nature* **619**, 500–505 (2023).

Fahmeed K. Sheehan, Haozhen Wang, Darjan Podbevšek, Elma Naranjo, Janel Rivera-Cancel, Cooper Moran, Rein V. Ulijn, and **Xi Chen**. Aromatic zipper topology dictates water-responsive actuation in phenylalanine-based crystals. *Small* **19**, 2207773 (2023).

Yeojin Jung, Maheen K. Khan, Darjan Podbevšek, Tejaswini Sudhakar, Raymond S. Tu, and **Xi Chen**. Enhanced water-responsive actuation of porous *Bombyx mori* silk. *Soft Matter* **19**, 2047-2052 (2023).

Zhi-Lun Liu, **Xi Chen**. Water-content-dependent morphologies and mechanical properties of *Bacillus subtilis* spores' cortex peptidoglycan. *ASC Biomaterials Science & Engineering* **8**, 5094-5100 (2022).

Qian Cheng, Tianwei Jin, Yupeng Miao, Zhe Liu, James Borovilas, Hanrui Zhang, Shuwei Liu, So-Yeon Kim, Ruiwen Zhang, Haozhen Wang, **Xi Chen**, Long-Qing Chen, Ju Li, Wei Min, Yuan Yang. Stabilizing lithium plating in polymer electrolytes by concentration-polarization-induced phase transformation. *Joule* **10**, 2372-2389 (2022).

Haozhen Wang, Zhilun Liu, Jianpei Lao, Sheng Zhang, Rinat Abzalimov, Tong Wang, and **Xi Chen**, High energy and power density peptidoglycan muscles through super-viscous nanoconfined water, *Advanced Science* **9**, 2104697 (2022). (Featured on the back cover. Major media coverage: Scienmag Science Magazine, AZO Materials, and Bioengineer.org.)

Norma Alcantar, Scott Banta, Anthony Cak, **Xi Chen**, Christopher DelRe, Leila Deravi, Jonathan Dordick, Brian Giebel, Dianne Greenfield, Peter Groffman, Mandë Holford, George John, Neel Joshi, Nick Kotov, Jin Montclare, Bradley Moore, Julia Ortony, Andrew Reinmann, Jiye Son, Ruth Stark, Rein Ulijn, Charles Vörösmarty, and Corey Wilson. Bioinspired green science and technology symposium in NYC, *Matter* **5**, 1980-1984 (2022).

Guitao Zhang, **Xi Chen**, Weihe Xu, Wei-Dong Yao, and Yong Shi, Piezoelectric property of PZT nanofibers characterized by resonant piezo-force microscopy, *AIP Advances* **12**, 035203 (2022).

Roxana Piotrowska, Travis Hesketh, Haozhen Wang, Alan R. G. Martin, Deborah Bowering, Chunqiu Zhang, Chunhua T. Hu, Scott A. McPhee, Tong Wang, Yaewon Park, Pulkit Singla, Thomas McGlone, Alastair Florence, Tell Tuttle, Rein V. Ulijn, and **Xi Chen**, Mechanistic insights of evaporation-induced actuation in supramolecular crystals, *Nature Materials* **20**, 403-409 (2021). (Featured on the front cover and by Panče Naumov, Actuators powered by water hydrogen bonds, *Nature Materials* **20**, 287–288 (2021). Major media coverage: Science Daily, ScienMag, Phys.org, Nanowerk, and Inverse.)

Yeojin Jung, Samaneh Sharifi Golru, Tai-De Li, Elizabeth J. Biddinger, Raymond S. Tu, **Xi Chen**, Tuning water-responsiveness with *Bombyx mori* silk-silica nanoparticle composites, *Soft Matter* **17**, 7817-7821 (2021).

Yaewon Park, Yeojin Jung, Tai-De Li, Jianpei Lao, Raymond S. Tu, and Xi Chen, β-sheet nanocrystals dictate water responsiveness of *Bombyx mori* silk, *Macromolecular Rapid Communications* **41**, 1900612 (2020). (Featured on the back cover.)

Yaewon Park and **Xi Chen**, Water-responsive materials for sustainable energy applications, *Journal of Materials Chemistry* A **8**, 15227-15244 (2020). (Featured on the back cover.)

Onur Cakmak, Hassan O. El-Tinay, **Xi Chen**, and Ozgur Sahin, Spore based water-resistant water-responsive actuators with high power density, *Advanced Materials Technologies* **4**, 1800596 (2019).

Ahmet-Hamdi Cavusoglu, **Xi Chen**, Pierre Gentine, and Ozgur Sahin, Potential for natural evaporation as a reliable renewable energy resource, *Nature Communications* **8***,* 617 (2017). (Major media coverage: *Discover*, *Gizmodo*, *Popular Mechanics*, *MIT Technology Review*, and *Popular Science*)

Xi Chen, Davis Goodnight, Zhenghan Gao, Ahmet-Hamdi Cavusoglu, Nina Sabharwal, Michael Delay, Adam Driks, and Ozgur Sahin, Scaling up nanoscale water-driven energy conversion into evaporation-driven engines and generators, *Nature Communications* **6**, 7346 (2015). (Highlighted in *Nature* and *Science NOW*. Major media coverage: *NBC News, PBS, The New York Times, The Washington Post, The Guardian, BBC*, *Scientific American*, and *Discovery News*.)

Xi Chen, L Mahadevan, Adam Driks and Ozgur Sahin, *Bacillus* spores as building blocks for stimuli-responsive materials and nanogenerators, *Nature Nanotechnology* **9**, 137-141 (2014). (Highlighted in *Science*. Major media coverage: *The Wall Street Journal* and *Discovery News*.)

Xi Chen, Stephen Guo, Jinwei Li, Guitao Zhang, Ming Lu and Yong Shi, Flexible piezoelectric nanofiber composite membranes as high performance acoustic emission sensors, *Sensors and Actuators A* **199**, 372-378 (2013).

Jinwei Li, **Xi Chen**, Weihe Xu, Chang-Yong Nam, and Yong Shi, TiO_2 nanofiber solid state dye sensitized solar cell with thin TiO_2 hole blocking layer prepared by atomic layer deposition, *Thin Solid Films* **536**, 275-276 (2013)

Weihe Xu, Jinwei Li, Guitao Zhang, **Xi Chen**, Richard Galos, Hamid Hadim, Ming Lu, Yong Shi, A low-cost MEMS tester for measuring single nanostructure's thermal conductivity, *Sensors and Actuators A* **191**, 89–98 (2013)

Xi Chen, Shiyou Xu, Nan Yao, and Yong Shi, Young's modulus determination of unpolled electrospun PZT nanofibers, *Science of Advanced Materials* **4**, 847-850 (2012). (Invited)

Xi Chen, Anton Li, Nan Yao, and Yong Shi, Adjustable stiffness of individual piezoelectric nanofibers by electron beam polarization, *Applied Physics Letters* **99**, 193102 (2011).

Xi Chen, Jinwei Li, Guitao Zhang, and Yong Shi, PZT nano active fiber composites for acoustic emission detection, *Advanced Materials* **23**, 3965–3969 (2011). (Frontispiece)

Jinwei Li, **Xi Chen**, Nan Ai, Jumin Hao, Qi Chen, Stefan Strauf and Yong Shi, Silver nanoparticle doped TiO_2 nanofiber dye sensitized solar cells, *Chemical Physics Letters* **514**, 141-145 (2011).

Xi Chen, Shiyou Xu, Nan Yao, and Yong Shi, 1.6 volt nanogenerator for mechanical energy harvesting using PZT nanofibers, *Nano Letters* **10**, 2133-2137 (2010).

Xi Chen, Shiyou Xu, Nan Yao, Weihe Xu, and Yong Shi, Potential measurement from a single lead ziroconate titanate nanofiber using a nanomanipulator, *Applied Physics Letters* **94**, 253113 (2009).

Xi Chen, and Fengtian Han, Design and experiment with miniaturized high-voltage DC-DC switching power supply, *Electrical Measurement & Instrumentation* **43**, 481 (2006). (In Chinese)

Book chapters

Xi Chen, Nan Yao, and Yong Shi, "Mechanical Properties Characterization of PZT Nanofibers," *Nanocantilever Beams: Modeling, Fabrication, and Applications*, eds. Ioana Voiculescu, Mona Zaghloul, Pan Stanford (2016).

Xi Chen, and Yong Shi, "PZT Nano Active Fiber Composites Based Acoustic Emission Sensor," *Selected Topics in Micro/Nano-robotics for Biomedical Applications*, eds. Yi Guo, Springer (2012).

Xi Chen, Nan Yao, and Yong Shi, "Energy Harvesting Based on PZT Nanofibers," *Energy Efficiency and Renewable energy through Nanotechnology*, eds. Ling Zhang, Springer Series in Nanoscience and Technology (2011).

Patents

Xi Chen, Ahu Aydogan, Michael Monsalve-Ramirez, Raymond S. Tu, Darjan Podbevsek, and Sheikh Alif. Evaporation-powered air circulation system. Provisional patent applications, US 63/691,092 (2024).

Xi Chen, Raymond S. Tu, Yeojin Jung, and Darjan Podbevšek, Silk-Composite-Based Water-Responsive Actuators, Provisional patent applications, US 63/651,539 (2024).

Xi Chen, Rein Ulijn, and Roxana Piotrowska, Humidity-responsive tripeptide crystals, United States Patent application. No. US 62/956,270.

Xi Chen, Zhi-Lun Liu, Mir Ahnaf Hussain, Zane Shatz, Rein V. Ulijn, Yi‐Ren Wang, Daniela Kroiss and Haozhen Wang, Water‐responsive materials and uses therefor, United States Patent. US 10,961,988 B2.

Xi Chen, Davis W. Goodnight, Ozgur Sahin, Evaporation-driven engines, WIPO Patent. No. WO 2015172067 A1.

Fengtian Han, **Xi Chen**, Qiuping Wu, and Jingxin Dong, Electrostatically levitated micromotor based on MEMS technology. China Patent. No. CN200610011606.0.

Conference Proceedings & Presentations

Vignesh Athiyarath, Elma Naranjo, **Xi Chen**, Rein Ulijn. Context-Adaptive Topology in Peptide Crystals. *Gordon Research Conference in Peptide Materials*, Pomona, CA, January, 2025. (Poster)

Elma Naranjo, Vignesh Athiyarath, **Xi Chen**, Rein Ulijn. Impact of Aromatic and Aliphatic Zippers on the Water Responsiveness of Hydrophobic Dipeptide Crystals. *Gordon Research Conference in Peptide Materials*, Pomona, CA, January, 2025. (Poster)

Darjan Podbevšek, Maheen K. Khan, Yeojin Jung, Honghui Yu, Raymond S. Tu and **Xi Chen**. The Influence of Water Structure on Water-Responsive Actuation of Bombyx Mori Silk. *2024 AIChE Annual Meeting*. 2024 October 27; San Diego, CA. (Oral presentation)

Vignesh Athiyarath, Elma Naranjo, **Xi Chen**, Rein Ulijn. Ultrashort Peptide Crystals with Adaptive Topology. *Gordon Research Conference (GRC) 2024, Systems Chemistry*, University of Southern Maine in Maine, United States, June 2024. (Poster)

Vignesh Athiyarath, Elma Naranjo, **Xi Chen**, Rein Ulijn. Ultrashort Peptide Crystals with Adaptive Topology*The Bio-Inspired Green (BIG) Science & Technology Symposium*, New York, April 2023. (Poster)

Seungri Kim, **Xi Chen**. The Influence of H-bonding Strength on the Water-responsiveness of B. subtilis cell walls using Hofmeister Salts. *2023 NanoBioNYC at Graduate Center*, New York, April 18, 2023. (Oral presentation)

Seungri Kim, **Xi Chen**. Effects of H-bonding strength on Water-responsiveness of B. subtills cell walls. *2023 Bioinspired green science and technology symposium in NYC*, New York, April 20-21, 2023.

Vignesh Athiyarath, Elma Naranjo, **Xi Chen**, Rein Ulijn. Supramolecular Peptide Crystals with Hydrophilic and Hydrophobic Pores for Chemo-Mechanical and Mechano-Chemical Actuation. *2023 MRS Spring Meeting and Exhibit*, San Francisco, April 10-14, 2023.

Yeojin Jung, Maheen K. Khan, Darjan Podbevšek, Raymond S. Tu, **Xi Chen**. Water-Responsive Bombyx Mori Silk for High-Energy Actuators, *2023 Bioinspired green science and technology symposium in NYC*, New York, April 20-21, 2023.

Fahmeed Sheehan, Haozhen Wang, Darjan Podbevsek, Rein Ulijn, **Xi Chen**. Understanding the role of aromatic architecture in tuning water-responsive behavior of peptide crystals. *2023 MRS Spring Meeting & Exhibit*, San Francisco, April 10-14, 2023.

Yeojin Jung,Maheen Khan, Darjan Podbevsek,Raymond Tu, **Xi Chen**. Effect of porosity on silk's water-responsive actuation, *2023 MRS Spring Meeting and Exhibit*, San Francisco, April 10-14, 2023.

Malcom Lane Gilchrist, Seungri Kim, **Xi Chen**. Peptidoglycan-bioconjugates from extremophillic microorganisms for new bioinspired water-responsive materials, *2022 AIChE Annual Meeting*, Phoenix, November 13-18, 2022.

Haozhen Wang, Zhi-lun Liu, Seungri Kim, Tai-De Li, **Xi Chen**. High water-responsiveness of peptidoglycan from gram-positive *Staphylococcus aureus* and *Saccharomyces cerevisiae*. *2021 Materials Research Society (MRS) Fall Meeting & Exhibit*, Boston, December 2, 2021. (Oral presentation)

Yeojin Jung, Samaneh Sharifi Golru, Tai-De Li, Elizabeth J. Biddinger, Raymond S. Tu, and **Xi Chen**. Water-responsive actuation of *Bombyx mori* silk/silica nanocomposites. *2021 American Institute of Chemical Engineers (AIChE) Annual Meeting*, Boston, November 8, 2021. (Oral presentation)

Zhi-Lun Liu, and **Xi Chen**. Cavitation pressure limit of water confined in bio-mimetic water-responsive structures. *2021 American Institute of Chemical Engineers (AIChE) Annual Meeting*, Boston, November 8, 2021. (Oral presentation)

Zhi-Lun Liu, Haozhen Wang, and **Xi Chen**. Nanoconfined water endows peptidoglycan extreme water-responsive actuation. *2021 American Institute of Chemical Engineers (AIChE) Annual Meeting*, Boston, November 8, 2021. (Oral presentation)

Haozhen Wang, Zhi-lun Liu, Seungri Kim, **Xi Chen**. Water-responsive actuation of gram-negative/-positive bacterial peptidoglycan. *2021 American Institute of Chemical Engineers (AIChE) Annual Meeting*, Boston, November 8, 2021. (Poster presentation)

Yeojin Jung, Raymond S. Tu, and **Xi Chen**, Programming Bombyx mori silk's water-responsive actuation using silica nanoparticles, *2021 Virtual MRS Spring meeting*, April 17-23, 2021. (Virtual)

Yeojin Jung, Yaewon Park, Tai-De Li, Jianpei Lao, Raymond S. Tu, and **Xi Chen**, Water-responsive *Bombyx mori* silk for high-efficiency actuators, *2021 CUNY Nano Day*, April 22, 2021. (Virtual)

Zhi-Lun Liu, Haozhen Wang, Jianpei Lao, Sheng Zhang, Rinat Abzalimov, Tong Wang, and **Xi Chen**, Extreme energy and power densities of peptidoglycan muscles, *2021 CUNY Nano Day*, April 22, 2021. (Virtual)

Zhi-Lun Liu and **Xi Chen**, Harvest evaporation energy using nano-confined water's properties, *2021 Sustainable Nanotechnology Organization (SNO) Mentoring Program*, March 24, 2021. (Virtual)

Yaewon Park, Yeojin Jung, and **Xi Chen**, Regenerated Bombyx mori silk that mimics spider silk's superior water responsive, *2020 MRS Fall Meeting and Exhibit*, November 27 - December 4, 2020. (Virtual)

Zhi-Lun Liu, Haozhen Wang, and **Xi Chen**, Peptidoglycan isolated from *Bacillus subtilis* spores shows extreme stimuli-responsive actuation, *2020 MRS Fall Meeting and Exhibit*, November 27 - December 4, 2020. (Virtual)

Yeojin Jung, Yaewon Park, Raymond S. Tu, and **Xi Chen**, Engineering *Bombyx Mori* silk into high-energy water responsive actuators, *2020 Virtual AIChE Annual Meeting*, November 15-20, 2020. (Virtual)

Zhi-Lun Liu, Haozhen Wang, and **Xi Chen**, Peptidoglycan dominates Bacillus subtilis spore's water-responsive actuation, *2020 Virtual AIChE Annual Meeting*, November 15-20, 2020. (Virtual)

Zhi-Lun Liu, Haozhen Wang, and **Xi Chen**, Extreme energy and power densities of peptidoglycan muscles, *2020 City college ChemE graduate student symposium*, November 9, 2020. (Virtual)

Zhi-Lun Liu, Haozhen Wang, Sheng Zhang, and **Xi Chen**, Cortex dominates *Bacillus subtilis* spore's water-responsive behaviors, *Converge to Transform webinar series and interdisciplinary poster session*, June 23, 2020. (Virtual)

Roxana Piotrowska, Travis Hesketh, Haozhen Wang, Alan R. G. Martin, Deborah Bowering, Chunqiu Zhang, Chunhua T. Hu, Scott McPhee, Tong Wang, Yaewon Park, Pulkit Singla, Thomas McGlone, Alastair Florence, Tell Tuttle, Rein V. Ulijn, and **Xi Chen**, Programming tri-peptides water-responsive materials, *Virtual Symposium: Systems Chemistry*, New York, NY, May 18-20, 2020. (Virtual)

Roxana Piotrowska, Travis Hesketh, Haozhen Wang, Alan Martin, Deborah Bowering, Scott McPhee, Rein V. Ulijn, and **Xi Chen**, Programming tri-peptides water-responsive materials, *2019 MRS Fall Meeting & Exhibit*, Boston, December 1-6, 2019.

Zhi-Lun Liu, Haozhen Wang, and **Xi Chen**, Cortex dominates *Bacillus subtilis* spore's water-responsive behaviors, *2019 MRS Fall Meeting & Exhibit*, Boston, December 1-6, 2019.

Haozhen Wang, Zhi-lun Liu, and **Xi Chen**, Bacterial cell walls exhibit high water responsive pressures and energy densities, *2019 MRS Fall Meeting & Exhibit*, Boston, December 1-6, 2019.

Yaewon Park, Yeojin Jung, Raymond Tu, and **Xi Chen**, Controlling microstructure of Bombyx Mori silk for water-responsive actuation, *2019 MRS Fall Meeting & Exhibit*, Boston, December 1-6, 2019

Roxana Piotrowska, Travis Hesketh, Alan Martin, Deborah Bowering, Haozhen Wang, Chunhua T. Hu, Pulkit Singla, Rein V. Ulijn, and **Xi Chen**. Self-assemble tri-peptides into water-responsive materials. *2019 AIChE Annual Meeting*, Orlando, November 10-15, 2019.

Xi Chen. Nanostructured water-responsive materials for evaporation energy harvesting. *IEEE International Conferences on Manipulation, Manufacturing and Measurement on the Nanoscle*, Zhenjiang China, August 2019.

Roxana Piotrowska, Travis Hesketh, Haozhen Wang, Alan Martin, Deborah Bowering, Scott McPhee, Pulkit Singla, Rein V. Ulijn, and **Xi Chen**, Water-responsive tripeptide crystals, *24th International Conference on the Chemistry of the organic solid state*, New York, NY, June 17, 2019

Xi Chen. Got Water? Evaporation-Driven Engines and Generators. *MRS Fall Meeting & Exhibit*, Boston, November 2017.

Michael DeLay, **Xi Chen**, Jonathan Dworkin, Adam Driks, Ozgur Sahin. Microcantilever investigation of nanoconfinement effects on water exchange. *Biophysical Society 61th Annual Meeting*, New Orleans, February 11-15, 2017. (Poster Presentation)

Michael DeLay, **Xi Chen**, Ahmet-Hamdi Cavusoglu, Adam Driks, and Ozgur Sahin. Nanoconfinement effects on spore water exchange, European Spore Conference, Royal Holloway, University of London, April 2016.

Xi Chen, Zhenghan Gao, Ahmet-Hamdi Cavusoglu, Michael DeLay, Onur Cakmak, Adam Driks, and Ozgur Sahin. Using bioinspired water-responsive materials to build evaporation-driven engines. *2016 MRS Spring Meeting & Exhibit*, March 28 - April 1, Phoenix, AZ, 2016. (Poster Presentation)

Ahmet-Hamdi Cavusoglu, **Xi Chen**, Ozgur Sahin, Potential of water-responsive materials to harvest energy from evaporation, *Proceeding of TechConnect World Innovation Conference*, June 14-17, Washington, DC, 2015.

Ahmet-Hamdi Cavusoglu, **Xi Chen**, Kathleen Tatem, Ozgur Sahin, Rapid prototyping bacterial spore hygro-actuators for soft robotics and adaptive materials, *Proceeding of TechConnect World Innovation Conference*, June 14-17, Washington, DC, 2015.

Xi Chen, Davis W. Goodnight, Zhenghan Gao, Ahmet-Hamdi Cavusoglu, Nina Sabharwal, Michael DeLay, Adma Driks, Ozgur Sahin, Using spores of Bacillus to create evaporation-driven engines, *Biophysical Society 59th Annual Meeting*, February 7-11, Baltimore, 2015. (Poster Presentation)

Michael DeLay, **Xi Chen**, Jonathan Dworkin, Adam Driks, Ozgur Sahin, The bacterial spore as an energy-rich adaptive material, *Biophysical Society 59th Annual Meeting*, February 7-11, Baltimore, 2015.

Xi Chen, Ahmet-Hamdi Cavusoglu, Davis M Goodnight, Zhenghan Gao, Adam Driks, Ozgur Sahin, Water-Responsive Hybrid Spore/Plastic Materials for Giant Stroke Actuation and Energy Conversion from Evaporation, *2014 MRS Fall Meeting & Exhibit*, November 30 - December 5, Boston, 2014. (Poster Presentation)

Ahmet-Hamdi Cavusoglu, **Xi Chen**, and Ozgur Sahin, Power Generation and Water Savings Using Water-Responsive Materials, *2014 MRS Fall Meeting & Exhibit*, November 30 - December 5, Boston, 2014.

Ozgur Sahin, and **Xi Chen**, Bacillus spores as building blocks for stimuli-responsive materials and nanogenerators, *APS March Meeting 2014*, Volume 59, Number 1, March 3–7, Denver, Colorado, 2014.

Xi Chen, L. Mahadevan, Adam Driks, and Ozgur Sahin, Bacillus Spores as High Energy Density Stimuli-Responsive Materials, *2013 MRS Fall Meeting & Exhibit*, December 1-6, Boston, 2013. (Oral Presentation)

Xi Chen, and Ozgur Sahin, AFM based probing of nanoscale energy conversion processes in biological materials, *16th International Conference on Non-Contact Atomic Force Microscopy*, August 5-9, Maryland, 2013. (Oral Presentation)

Xi Chen, and Yong Shi, Characterization of piezoelectric nanofiber composite acoustic sensor for structure health monitoring, *Proceeding of ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDET/CIE)*, August 12-15, Chicago, Illinois, 2012.

Yong Shi, and **Xi Chen**, High Voltage Output Nanogenerator Based on PZT Nanofibers, *Proceeding of the 39th Annual Meeting & Exposition of the Controlled Release Society*, July 15-18, Québec City, Canada, 2012.

Xi Chen, Stephen Guo, and Yong Shi, Acoustic emission transducer based on PZT nanofibers, *Proceeding of the 25rd International Conference on Micro Electro Mechanical Systems (MEMS)*, January 29- February 2, Paris, France, 2012. (Poster Presentation)

Xi Chen, and Yong Shi, PZT nano active fiber composites based acoustic emission sensor, *ASME International Mechanical Engineering Congress & Exposition (IMECE)*, November 11-17, Denver, CO, USA, 2011. (Awarded Poster Presentation)

Xi Chen, Richard Galo, and Yong Shi, A Self-powered PZT Nanofiber composites sensor for structure health monitorin, *Proceeding of the 6th International Workshop on Advanced Smart Materials and Smart Structures Technology (ANCRiSST)*, July 25-26, Dalian, China, 2011.

Richard Galo, **Xi Chen**, and Yong Shi, Ultralow power energy storage circuit for piezoelectric nanogenerators, *Proceeding of ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDET/CIE)*, August 28-31, Washington, DC, USA, 2011.

Xi Chen, and Yong Shi, Electrical determination of elastic modulus of individual PZT nanofibers by in situ SEM, *Proceeding of ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDET/CIE)*, August 28-31, Washington, DC, USA, 2011. (Oral Presentation)

Wuming Jing, **Xi Chen**, Sean Lyttle, Zhenbo Fu, Yong Shi, David Cappelleri, A magnetic thin film microrobot with two operating modes, *Proceeding of IEEE ICRA*, May 9-13, Shanghai, China, 2011.

Xi Chen, and Yong Shi, A PZT nanoscale active fiber composites acoustic emission sensor for structure health monitoring, *Proceeding of SPIE Smart Structures/NDE*, March 6-10, San Diego, CA, USA, 2011. (Poster Presentation)

Xi Chen, and Yong Shi, Nanoscale active fiber composites acoustic emission sensor, *Proceeding of NSF Engineering Research and Innovation Conference*, January 4-7, Atlanta, Georgia, 2011.

Xi Chen, Shiyou Xu and Yong Shi, Electro-mechanical coupling of piezoelectric nanocomposites, *Proceeding of ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDET/CIE)*, August 15-18, Montreal, Quebec, Canada, 2010.

Wuming Jing, **Xi Chen**, Sean Lyttle, Zhenbo Fu, Yong Shi and David J. Cappelleri, Design of a micro-scale magnetostrictive asymmetric thin film bimorph (μMAB) microrobot, *Proceeding of ASME International Mechanical Engineering Congress & Exposition (IMECE)*, November 12-18, Vancouver, British Columbia, Canada, 2010.

Xi Chen, Yong Shi, Sundeep Mangla and Ming Zhang, Modelling and simulation of a bio-mimetic MEMS actuator with self-sensing for thrombus retrieving, *Proceeding of ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDET/CIE)*, August 3-6, Brooklyn, New York, USA, 2008. (Poster Presentation)

Xi Chen, Fengtian Han and Yunfeng Liu, Modeling of an electrostatic micromotor based on a levitated rotor, *Proceeding of International Conference on Integration and Commercialization of Micro and Nano-Systems*, January 10-13, Sanya, Hainan, China, 2007. (Poster Presentation)

INVITED TALKS

Chemical and Biomedical Engineering, University of Maine, Maine, October 2024.

ACS New York Nanoscience Discussion Group, NYU, New York, September 2024.

TechConnect World Innovation Conference & Expo, Washington DC, June 2024. (Key speaker)

The New York Bacillus Interest Group (NYBIG), NYU, New York, June 2024.

Salzberg Chemistry Seminar, CCNY, New York, February 2024.

Society of Engineering Science, Minneapolis, October 2023.

Department of Chemistry, Kyoto University, Kyoto, October 2023.

Institute for Integrated Cell-Material Sciences, Kyoto, October 2023.

Department of Precision Instrument, Tsinghua University, June 2022. (Virtual)

Bio-Inspired and Green (BIG) Science and Technology Symposium, Advanced Science Research Center, April 2022.

Department of Materials Science and Engineering, University of California Riverside, April 2022.

Department of Polymer Science and Engineering, University of Massachusetts Amherst, November 2021.

Department of Chemical and Biological Engineering, Colorado School of Mines, October 2021.

Department of Physics, Brooklyn College, October 2021. (Virtual)

Webinar: Finding Inspiration for Functional Nanomaterials from Nature, The New York Academy of Sciences, June 2021. (Virtual)

IEEE International Conferences on Manipulation, Manufacturing and Measurement on the Nanoscale, Zhenjiang China, August 2019. (Keynote speaker)

Department of Chemistry, Lehman College, March 2019.

Department of Physics, Queens College, April 2018.

Department of Chemical Engineering, NYU Tandon Engineering School, April 2018.

Sustainability and Nanotechnology, MRS Fall Meeting & Exhibit, Boston, November 2017.

Physics Colloquium, Department of Physics, City College of New York, November 2017.

Department of Chemistry, College of Staten Island, October 2017.

Blavatnik Science Symposium, New York Academy of Sciences, July 2017.

LSM/IAMDN Seminar, Rutgers, The State University of New Jersey, April 2017.

Biodesign Challenge, Parson School of Design, March 2017.

Bio-Inspired Nanomaterials Symposium, CUNY Advanced Science Research Center, February 2017.

Research Information Series lecture, City College of New York, February 2017.

The New York Nanoscience Discussion Group, New York University, October 2016.

GRANTS & CONTRACTS FOR RESEARCH

AFoSR 83566-RT-REP (PI: PI: Raymond Tu, co-PI: Xi Chen) 04/01/25-03/31/29
Project/Proposal Title: NSF Convergence Accelerator Track M: Water responsive Materials for Evaporation Energy Harvesting.
Total Award Amount: $1,000,000.

CUNY I&E Prototyping Fund (PI: Xi Chen, co-PI: Ahu Aydogan) 1/1/25-6/30/25
Project/Proposal Title: Prototyping of plant-based evaporation-powered air filtration systems.
Total Award Amount: $10,000.

CCNY TREAD (PI: Yang Liu, co-PI: Xi Chen) 9/1/25-12/31/27
Project/Proposal Title: Title: A Fundamental Study of the Anti-Icing Mechanisms of a Bacteria-Spores-based coating in Mitigating Dynamic Droplet Impinging and Freezing.
Total Award Amount: $86,856.

CUNY Capital GRTI (PI: Xi Chen, co-PI: Rein Ulijn, Christopher DelRe) 3/1/24-6/30/25
Project/Proposal Title: Environmental X-ray diffraction and small-angle X-ray scattering system for characterization of biological and bioinspired materials.
Total Award Amount: $345,032.

NSF ITE-2344305 (PI: Xi Chen) 01/15/24-6/30/25
Project/Proposal Title: NSF Convergence Accelerator Track M: Water responsive Materials for Evaporation Energy Harvesting.
Total Award Amount: $650,000.

NSF CBET-2238129 (PI: Xi Chen) 08/1/23-07/31/28

Project/Proposal Title: CAREER: Programmable Negative Water Adsorption of Bioinspired Hygroscopic Materials.
Total Award Amount: $538,574.

NSF CHE-2304959 (PI: Xi Chen) 05/10/23-07/31/26
Project/Proposal Title: Collaborative Research: Water-responsive, Shape-shifting Supramolecular Protein Assemblies.
Total Award Amount: $173,091.

ONR N00014-22-1-2608 (PI: Xi Chen) 07/01/22-06/30/23
Project/Proposal Title: Pilot: wet spinning prototype of peptidoglycan/silk water-responsive actuators.
Total Award Amount: $50,000.

ARO W911NF-21-1-0172 (PI: Rein Uijn, co-PI: Xi Chen) 05/01/21- 04/30/24
Project/Proposal Title: Pre-organization and induced-fit in chemo-mechanical peptide materials.
Total Award Amount: $673,377.

AFoSR FA9550-21-1-0144 (PI: Raymond Tu, co-PI: Xi Chen) 05/01/21- 04/30/24
Project/Proposal Title: Engineering silk-based materials into "living" muscles.
Total Award Amount: $599,538.

ARO 78146-RT-REP (PI: Elizabeth Biddinger, co-PI: Xi Chen, Jeffrey Morris, Robert Messinger, Masahiro Kawaji, and Teresa Bandosz) 05/20/21-05/19/22
Project/Proposal Title: Advanced microcalorimeter for thermodynamic and kinetic analyses of materials.
Total Award Amount: $213,102.

CUNY Green Energy capital (PI: Rein Ulijn, co-PI: Donna McGregor and Xi Chen) 5/1/22-4/30/23
Project/Proposal Title: Offshore Wind Power/Green Energy.
Total Award Amount: $426,877.

PSC-CUNY Research Award Program (PI: Xi Chen) 7/1/20-12/31/22
Project/Proposal Title: Engineering silk-based materials into extreme water-responsive actuators.
Total Award Amount: $11,999.

CUNY Interdisciplinary Climate Crisis Research (PI: Chen, co-PI: Charles J. Vörösmarty and David Schwab) 4/1/20-3/27/21
Project/Proposal Title: Evaporation energy harvesting systems for waste heat recovery.
Total Award Amount: $8,000.

ASRC Seed Grant (PI: M. Lane Gilchrist, co-PI: Xi Chen) 07/01/20-06/30/21

Project/Proposal Title: Isolation of peptidoglycan from hyperthemophillic microorganisms for new bioinspired water-responsive materials.
Total Award Amount: $15,000.

NSF 1919866 (PI: Milan Begliarbekov, Senior Personnel: Xi Chen) 09/01/19-08/31/22
Project/Proposal Title: MRI: acquisition of a large-scale high-throughput electron beam lithography system for multi-scale patterning.
Total Award Amount: $900,000.

ONR N00014-18-S-B001 (PI: Chen) 01/23/19-04/21/21
Project/Proposal Title: Functional biomaterial learning kits based on cellulose evaporation engines.
Total Award Amount: $39,053.

CCNY GRTI Equipment Funding (PI: Chen) 12/19/18
Project/Proposal Title: Scaling up water-responsive artificial muscles.
Total Award Amount: $40,205.

ONR N00014-18-1-2492 (PI: Chen) 07/01/18-12/31/22
Project/Proposal Title: Bio-inspired Water-responsive Materials for Energy Conversion and Actuators.
Total Award Amount: $557,791.

ASRC Seed Grant (PI: Jing Fan, co-PI: Xi Chen) 07/01/18-06/30/19
Project/Proposal Title: Determining elastic properties of deformable membrane of micro-capsules/vesicles by AFM.
Total Award Amount: $30,000.

CCNY GRTI Equipment Funding (PI: Chen) 02/23/18
Project/Proposal Title: Development of Extreme Water-Responsive Artifical Muscles.
Total Award Amount: $32,841.

ASRC Seed Grant (PI: Nicolas Giovambattista, co-PI: Xi Chen) 01/07/17-06/30/19
Project/Proposal Title: Water-Responsive Materials for Energy Conversion and Storage.
Total Award Amount: $10,000.

American Chemical Society (PI: Adam Braunschweig, co-PI: Chen) 2018
Project/Proposal Title: Research Internships on Physical Science 2018.
Total Award Amount: $5,000.

PSC-CUNY Research Award Program (PI: Chen) 07/01/17-12/31/18
Project/Proposal Title: Water-Responsive Materials for Energy Conversion and Storage.

Total Award Amount: $6,000.

ADVISING & TEACHING

Post-doctoral advised

2022 – present **Dr. Vignesh Athiyarath** (co-advised by Rein Ulijn)
PhD in Chemistry, Indian Institute of Science Education and Research (2022)

2021 – 2025 **Dr. Darjan Podbevsek** (co-advised by Raymond Tu)
PhD in Physics, Claude Bernard University Lyon 1 (2018)
Presently Postdoc at New York University

2019 – 2021 **Dr. Yaewon Park**
PhD in Fiber and Polymer Science, North Carolina State University (2018)
Presently Assistant Professor at Yonsei University

Doctoral advised

2024 – present **Chengyu Sun**
M.S. and B.S. in Chemical Engineering, China University of Petroleum

2023 – present **Yuchen Zhang**
MS in Chemical Engineering, New York University

2022 – present **Nooshin Ayati (**co-advised by Raymond Tu)
BS in Materials Science, Amirkabir University

2022 – present **Janel Rivera Cancel (**co-advised by Nicolas Giovambattista)
BS in Pontifical Catholic University of Puerto Rico

2021 – present **Maheen Khan**
BS in Chemical Engineering, University of Massachusetts Amherst

2021 – present **Elma Naranjo (**co-advised by Rein Ulijn)
ME in Chemical Engineering, National University of Colombia

2021 – 2023 **Fahmeed Sheehan (**co-advised by Rein Ulijn)
BS in Chemistry, Hunter College

2020 – present **Gershon David Starr (**co-advised by Raymond Tu)
BS in Chemical Engineering, Oregon State University

2019 – 2024 **Seungri Kim**
BS in Sogang University

2018 – 2023 **Yeojin Jung** (co-advised by Raymond Tu)
MS in Sejong University

2018 – 2022 **Dr. Zhi-Lun Liu**
ME in Chemical Engineering, Cornell University
Presently Material Research Engineer at Macronix/IBM

2018 – 2022 **Dr. Haozhen Wang**
MS in Materials Science and Engineering, Columbia University
Presently Postdoctoral Researcher at Stanford University

2017 – 2021 **Dr. Roxy Piotrowska** (co-advised by Rein Ulijn)
BS in Chemistry, University of Applied Sciences Aarhus
Presently Investor Relations Associate at LifeSci Advisors, LLC

Advised >34 undergraduate research assistants, 7 master students, and 9 high-school research interns

Teaching

Instruction: Department of Chemical Engineering, The City College of New York

F2024, CHE J9600-Q: Introduction to Research Fundamentals

F2024, CHE I5700-R: Advanced Materials Engineering

S2024, CHE 49808-B: Nanomaterials

F2023, CHE I5700-R: Advanced Materials Engineering

S2023, CHE 49808-B: Nanomaterials

F2022, CHE I5700-R: Advanced Materials Engineering

F2021, CHE I5700-R: Advanced Materials Engineering

S2021, CHE 31000: Introduction to Material Sciences

F2020, CHE I0000-1E: Seminar

F2020, CHE I5700-R: Advanced Materials Engineering

S2020, CHE I0000-1E: Seminar

S2020, CHE 49808-B: Nanomaterials

F2019, CHE I0000-1E: Seminar

F2019, CHE I5700-R: Advanced Materials Engineering

S2019, CHE 31000: Introduction to Material Sciences

F2018, CHE I5700-R: Advanced Materials Engineering

S2018, CHE 31000: Introduction to Material Sciences

F2017, CHE I5700-R: Advanced Materials Engineering

S2017, CHE I9700: Q Report

Instruction: Advanced Science Research Center, CUNY (co-teaching)

S2025, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2024, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2023, CHEM 79051: Nanoscience Laboratory Course at the ASRC

F2021, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2020, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2019, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2018, CHEM 79051: Nanoscience Laboratory Course at the ASRC

S2017, CHEM 79051: Nanoscience Laboratory Course at the ASRC

PROFESSIONAL SERVICE & ACTIVITIES

Membership in professional societies

Member of the World Economic Forum Expert Network, since 2018.

Member of the Science and Technology in Society, since 2017.

Member of the American Institute of Chemical Engineers, since 2016.

Member of New York Academy of Sciences, since 2016.

Member of Materials Research Society, since 2014.

Conference session chair/co-chair

Session: " Biomimicry & Bioinspired Materials II" 2024 AIChE Annual Meeting, Oct. 2023, San Diego, CA.

Session: " Biomimicry & Bioinspired Materials" 2024 AIChE Annual Meeting, Oct. 2023, San Diego, CA.

Session: "Biomaterials II" 2023 AIChE Annual Meeting, Nov. 2023, Orlando, FL.

Session: "Biomaterials I" 2023 AIChE Annual Meeting, Nov. 2023, Orlando, FL.

Session: "Biomimetic Materials II" 2022 AIChE Annual Meeting, Nov. 2022, Phoenix, AZ.

Session: "Biomimetic Materials I" 2022 AIChE Annual Meeting, Nov. 2022, Phoenix, AZ.

Session: "Biomimetic Materials II" 2021 AIChE Annual Meeting, Nov. 2021, Boston, MA.

Session: "Biomimetic Materials I" 2021 AIChE Annual Meeting, Nov. 2021, Boston, MA.

Session: "Biomimetic Materials" 2020 Virtual AIChE Annual Meeting, Nov. 2020.

Session: "Peptide and Peptoid Based Materials" 2020 Virtual AIChE Annual Meeting, Nov. 2020.

Session: "Biomimetic Materials II" 2019 AIChE Annual Meeting, Nov. 2019, Orlando, FL.

Session: "Biomimetic Materials I" 2019 AIChE Annual Meeting, Nov. 2019, Orlando, FL.

Reviewing services

Nature Materials, Nature Nanotechnology, Nature Communications, Science Robotics, Journal of the American Chemical Society, Nano Letters, ACS Nano, Applied Physics Letters, Scientific Reports, Energy, IEEE Sensors, Journal of Applied Physics, Nanoscience and Nanotechnology Letters, Smart Materials and Structures, IEEE/ASME Transactions on Mechatronics, Journal of Physics D: Applied Physics, Micro & Nano Letters, Micromachines, Microscopy and Microanalysis.

Internal committee services

ASRC Data Management Committee (2024 – present)

CCNY ChE Communications Committee (2024 – present)

ASRC Scholarship Committee (2023 – present)

ASRC Nanoscience Event Committee (2022 – present)

ASRC Diversity, Equity and Inclusion (DEI) Committee (2021 – 2023)

CCNY Faculty Senate (2020 – present)

Chair, CCNY ChE Communications Committee (2017 – 2024)

CCNY ChE Ph.D. Committee (2017 – present)

CCNY ChE Space Committee (2017 – 2019)

CCNY ChE Faculty Meeting Secretary (2017 – 2020)