

## PROFILE

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My research focuses on exploring the emerging electronic properties of self-assembled functional biomaterials/nanomaterials and general rules for self-assembly. My recent study focuses on understanding of the charge transport in electronic active molecules. I have been working extensively on self-assembly of nanomaterials under non-equilibrium condition (e.g., evaporation-induced self-assembly). Moreover, I have solid background in organic-inorganic nanomaterial synthesis using organic templates, including DNA, self-assembled block-copolymer micelles, unimolecular star-like block-copolymers, or using conventional wet-chemistry strategies. I am particularly interested in creation of artificial neuron system using “bottom-up” self-assembly. To support my experimental study, I also have experiences in simulation (e.g., Monte Carlo simulation, first principle simulation) and theoretical modeling over a wide range of research areas, including materials science and engineering, mechanical engineering, physical chemistry, chemical physics and mechanics, combining strong data analytical skills.

## EDUCATION

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<b>Georgia Institute of Technology</b>	Atlanta, GA, US
PhD, Materials Science and Engineering	2011-2015
<b>Xi'an Jiaotong University</b>	Xi'an, China
MS, Materials Science and Engineering	2008-2010
<b>Xi'an Jiaotong University</b>	Xi'an, China
BS, Materials Science and Engineering	2004-2008

## PROFESSIONAL EXPERIENCE

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Postdoc, Department of Chemical & Biomolecular Engineering, <b>University of Illinois at Urbana-Champaign</b>	2015.7-present
Graduate Research Assistant, Department of Materials Science and Engineering, <b>Georgia Institute of Technology</b>	2011.8-2015.7

## BOOK

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1. **B. Li** and Z. Lin, “Soft, Hard, and Hybrid Janus Structures: Synthesis, Self-Assembly, and Applications”, World Scientific Publishing Company (Singapore), 2017

## BOOK CHAPTERS

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1. **B. Li**, J. Iocozzia and Z. Lin, “Directing Convection to Pattern Thin Polymer Films: Coffee Rings” chapter in “Instability-Based Methods for Patterning Polymer Surfaces”, J. Rodriguez-Hernandez and C. Drummond., Springer Press, 2015

## PEER REVIEWED JOURNAL PAPERS

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34. **B. Li**, S. Li, A. Ellington, E. Anslyn, C.M. Schroeder, “Single Molecule Study of Charge

Transport in Sequence-defined Redox Active Biomolecules”, (*in preparation*).

33. S. Li, H. Yu, K. Schwieter, K. Chen, **B. Li**, Y. Liu, J. S. Moore and C.M. Schroeder, "Charge Transport and Quantum Interference Effects in Oxazole-Terminated Conjugated Oligomers”, *Journal of the American Chemical Society*, **141**, 16079 (2019).
32. L.R. Valverde, **B. Li**, C.M. Schroeder, W.L. Wilson, "In situ photophysical characterization of  $\pi$ -conjugated oligopeptides assembled via continuous flow processing”, *Langmuir*, **35**, 10947 (2019).
31. C. Boucher-Jacobs, **B. Li**, C.M. Schroeder, D. Guironnet, " Solubility and activity of a phosphinosulfonate palladium catalyst in water with different surfactants”, *Polymer Chemistry*, **10**, 1988 (2019).
30. **B. Li**, H. Yu, E. C. Montoto, Y. Liu, S. Li, K. E. Schwieter, J. Rodriguez-Lopez, J. Moore and C. M. Schroeder, " Intrachain charge transport through conjugated donor-acceptor oligomers", *ACS Applied Electronic Materials*, **1**,7, (2018).
29. X. Li, **B. Li**, M. He, W. Wang, T. Wang, A. Wang, J. Yu, Z.L. Wang, S. W. Hong, M. Byun, S. Lin, H. Yu, and Z. Lin, "A Convenient and Robust Route to Photoswitchable Hierarchical Liquid Crystal Polymer Stripes via Flow-Enabled Self-Assembly”, *ACS Applied Materials & Interfaces*, **10**, 4961 (2018).
28. **B. Li**, B. Jiang, W. Han, M. He, X. Li, W. Wang, S.W. Hong, M. Byun, S. Lin and Z. Lin, " Harnessing Colloidal Crack Formation by Flow - Enabled Self - Assembly", *Angewandte Chemie International Edition*, **56**, 4554 (2017) (selected as Very Important Paper (VIP) paper and featured on the **Cover** of by *Angewandte Chemie International Edition*).
27. M. He, **B. Li**, X. Cui, B. Jiang, Y. He, Y. Chen, D. O’Neil, P. Szymanski, M. A. El-sayed, J. Huang and Z. Lin, "Meniscus-assisted solution printing of large-grained perovskite films for high-efficiency solar cells", *Nature Communications*, **8**, 16045 (2017)
26. **B. Li**, L.R. Valverde, F. Zhang, Y. Zhou, S. Li, Y. Diao, W. L. Wilson, and C. M. Schroeder, " Macroscopic alignment and assembly of  $\pi$ -conjugated oligopeptides using colloidal microchannels", *ACS Applied Materials & Interfaces*, **9**, 41586 (2017).
25. Y. Zhou, **B. Li**, S. Li, H.A.M. Ardoña, W.L. Wilson, J.D. Tovar, C.M. Schroeder, "Concentration-Driven Assembly and Sol–Gel Transition of  $\pi$ -Conjugated Oligopeptides", *ACS Central Science*, **9**, 986 (2017).
24. **B. Li**, S. Li, Y. Zhou, H.A.M. Ardoña, L. R. Valverde, W. L. Wilson, J. D. Tovar, C. M. Schroeder, "Nonequilibrium self-assembly of  $\pi$ -conjugated oligopeptide in solution", *ACS Applied Materials & Interfaces*, **9**, 3977 (2017).
23. B. Jiang, Y. He, **B. Li**, S. Zhao, S. Wang, Y. B. He and Z. Lin, "Polymer - Templated Formation of Polydopamine - Coated SnO<sub>2</sub> Nanocrystals: Anodes for Cyclable Lithium - Ion Batteries", *Angewandte Chemie International Edition*, **56**, 1869 (2017) (selected as Very Important Paper (VIP) paper and featured on the **Back Cover** of by *Angewandte Chemie International Edition*).
22. B. Jiang, C. Han, **B. Li**, Y. He and Z. Lin, "In-situ Crafting of ZnFe<sub>2</sub>O<sub>4</sub> Nanoparticles Impregnated within Continuous Carbon Network as Advanced Anode Materials ", *ACS Nano*, **10**, 2728 (2016).
21. L. Li, **B. Li**, C. Zhang, C. Tuan, Z. Lin and C. P. Wong, " A facile and low-cost route to high-aspect-ratio microstructures on silicon via a judicious combination of flow-enabled self-assembly and metal-assisted chemical etching", *Journal of Materials Chemistry C*, **4**, 8953 (2016).

20. L. Li, **B. Li**, Z. Lin and C. P. Wong, " A low-cost fabrication route for silicon microchannels and microgratings with flow-enabled polymer self-assembly patterning and wet etching", *Electronic Components and Technology Conference (ECTC), 2015 IEEE 65th*, 2149 (2016).
19. **B. Li**, C. Zhang, B. Jiang, W. Han and Z. Lin, "Flow-enabled self-assembly of large-scale aligned nanowires ", *Angewandte Chemie International Edition*, **54**, 4250 (2015) (selected as Very Important Paper (VIP) paper by *Angewandte Chemie International Edition*).
18. **B. Li**, B. Jiang, H. Tang and Z. Lin, "Unconventional seed-mediated growth of ultrathin Au nanowires in aqueous solution", *Chemical Science*, **6**, 6349 (2015).
17. B. Jiang, X. Pang, **B. Li** and Z. Lin, "Organic-Inorganic Nanocomposites via Placing Monodisperse Ferroelectric Nanocrystals in Direct and Permanent Contact with Ferroelectric Polymer", *Journal of the American Chemical Society*, **137**, 11760 (2015).
16. H. Tang, Y. He, **B. Li**, J. Jung, C. Zhang, X. Liu, and Z. Lin, " Continuous crafting of uniform colloidal nanocrystals using an inert-gas-driven microflow reactor", *Nanoscale*, **7**, 9731 (2015).
15. X. Xin, R. Biswas, **B. Li**, J. Jung, and Z. Lin, "Charge transfer at the semiconductor quantum dot/TiO<sub>2</sub> interface in quantum dot-sensitized solar cells: ab initio simulation", *Particle and Particle Systems Characterization*, **32**, 80 (2015).
14. **B. Li**, W. Han, B. Jiang and Z. Lin, "Crafting threads of diblock copolymer micelles via flow-enabled self-assembly", *ACS Nano*, **8**, 2936 (2014).
13. **B. Li**, L. Fang, and K. Sun, " Variance of particle size: another monitor to evaluate abrasive wear", *Tribology Letters*, **55**, 465 (2014).
12. C. Feng, X. Pang, Y. He, **B. Li**, and Z. Lin, "Crafting unimolecular nanocapsules from photo-crosslinkable core-shell star-like block copolymer", *Chemistry of Materials*, **26**, 6058 (2014).
11. J. Ren, Q. Zou, **B. Li** and Z. Lin, " High-speed atomic force microscope imaging: Adaptive multiloop mode", *Physical Review E*, **90**, 012405(2014).
10. **B. Li**, W. Han, M. Byun, L. Zhu, Q. Zou, and Z. Lin, "Macroscopic highly aligned DNA nanowires created by controlled evaporative self-assembly", *ACS Nano*, **7**, 4326 (2013).
9. W. Han, **B. Li**, and Z. Lin, "Drying-mediated assembly of colloidal nanoparticles into large-scale microchannels", *ACS Nano*, **7**, 6079 (2013)
8. W. Han, M. He, M. Byun, **B. Li**, and Z. Lin, "Large-scale hierarchically structured conjugated polymer assemblies with enhanced electrical conductivity", *Angewandte Chemie International Edition*, **52**, 2564 (2013) (selected as Very Important Paper (VIP) paper by *Angewandte Chemie International Edition*).
7. M. Byun, W. Han, **B. Li**, X. Xin, and Z. Lin, "An unconventional route to hierarchically ordered block copolymer on gradient patterned surface enabled by controlled evaporative self-assembly", *Angewandte Chemie International Edition*, **52**, 1122(2013).
6. W. Han, M. Byun, **B. Li**, X. Pang, and Z. Lin, "A simple route to hierarchically assembled micelles and inorganic nanoparticles", *Angewandte Chemie International Edition*, **51**, 12588 (2012).
5. M. Byun, W. Han, **B. Li**, S. Hong, J. Cho, Q. Zou, and Z. Lin, "Guided organization of  $\lambda$ -DNA into microring arrays from liquid capillary bridge", *Small*, **12**, 1641 (2011).
4. K. Sun, L. Fang, W. Yan, **B. Li**, Y. Wang, " Kinetics of surface nanocrystallization for hadfield steel in shot peening", *Advanced Science Letters*, **4**, 1862 (2011).

3. K. Sun, **B. Li**, L. Fang, Q. Ye, "A novel rapid prototyping system for expandable polystyrene", *Rapid Prototyping Journal*, **17**, 17 (2011).
2. L. Fang, **B. Li**, J. Zhao, K. Sun, "Computer simulation of the two-body abrasion process modeling the particle as a paraboloid of revolution", *Journal of Materials Processing Technology*, **209**, 6124 (2009).
1. L. Fang, J. Zhao, **B. Li**, K. Sun, "Movement patterns of ellipsoidal particle in abrasive flow machining", *Journal of Materials Processing Technology*, **209**, 6048 (2009).

## PATENT

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*On-Chip Nanoscale Storage System Using Chimeric DNA*

U.S. Patent Application No. 16/593,450 (Filed October 4, 2019)

Inventor(s): Olgica Milenkovic, Nagendra Athreya, Apratim Khandelwal, Jean-Pierre Leburton, Xiuling Li, Charles Schroeder, Kasra Tabatabaei, and **Bo Li**

## TEACHING EXPERIENCE

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5. Mentor, Biophysics 586, *Special Topics in Biophysics*, University of Illinois Urbana-Champaign, spring 2018.
4. Guest Lecturer, MSE 8803, *Nanomaterials and Nanotechnology*, Georgia Institute of Technology, spring 2014, spring 2015.
3. Mentor, MSE 4410, *Senior Capstone Engineering Design*, Georgia Institute of Technology, fall 2014, supervised 4 groups of MSE undergraduates to complete their senior design projects.
2. Teaching Assistant, MSE 4140, *Polymer Physics*, Georgia Institute of Technology, fall 2013, fall 2012.
1. Teaching Assistant, MSE 3720, *Introduction to the Polymer, Fiber, Textile, & Fabricated Products Enterprises*, Georgia Institute of Technology, spring 2013.

## INVITED SEMINAR & PRESENTATIONS (SELECTED)

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10. Colloid & Soft Matter seminar, 2015, Atlanta, GA, US (*invited 45min talk*, Crafting Nanomaterial Patterns via Flow-Enabled Self-Assembly (FESA))
9. APS March Meeting, 2018, Los Angeles, CA, US (Tuning the Conductance of Oligopeptides in Single-Molecule Junctions).
8. AIChE Annual Meeting, 2016, San Francisco, CA, US (Colloidal Directed Assembly of Pi-Conjugated Oligopeptides for Supramolecular Electronics).
7. APS March Meeting, 2016, Baltimore, MD, US (Directed self-assembly of pi-conjugated oligopeptides for supramolecular electronics).
6. APS March Meeting, 2014, Denver, CO, US (Programmable Crafting of Hierarchically Structured Block Copolymer/Nanoparticles (and Nanorods) via Flow Enabled Self-Assembly).
5. ACS National Meeting, March, 2014, Dallas, TX, US (Programmable crafting of PS-b-P4VP micelles via flow enabled self-assembly).
4. 7th Southeast Meeting on Soft Materials and Interfaces, 2013, Atlanta, GA, US (Crafting

Ordered Structures by Flow-Enabled Self-Assembly (FESA))

3. MRS Spring Meeting, April, 2012, San Francisco, CA, US (Macroscopic Highly Ordered DNA Spokes Using Controlled Evaporative Self-assembly).
2. 1st International Conference on Abrasive Processes, September, 2008, Cambridge, UK (Computer simulation of the two-body abrasion process modeling the particle as a paraboloid of revolution).
1. Collaborators have presented 21 presentations and posters at conferences (not listed here) where Bo Li is a co-author, 2011-2019

## SELECTED SKILLS

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**Communication Languages:** English, Chinese

**Programming Languages:** C/C++, HTML, FORTRAN

**Simulation Software:** Simio, ABAQUS, ANSYS, SIESTA

**Instrumentation:** Atomic Force Microscopy (AFM), Transmission Electron Microscopy (TEM), Scanning Electron Microscope (SEM), Optical Microscope (OM),

**Facilities developed by me in lab:** Tunneling microscope-based break-junction (STM-BJ), System for Flow-Enabled Self-Assembly