

Dr. Junjun Ding, Ph.D., Assistant Professor

ADDRESS

Materials Science and Engineering,
Inamori School of Engineering,
New York State College of Ceramics,
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EDUCATION

STEVENS INSTITUTE OF TECHNOLOGY

Hoboken, NJ, USA

Ph.D. in Mechanical Engineering (May 2017)

- Dissertation Title: Nanofabrication and Nanopatterning of Carbon Nanomaterials for Flexible Electronics
- Advisor: Dr. Frank T. Fisher
- Co-advisor: Dr. Eui-Hyeok Yang

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA

Hefei, China

M.S. in Mechanical Engineering (June 2010)

- Master Thesis: Research of Femtosecond Laser Micro Fabrication of Functional Micro Devices and Applications
- Advisor: Dr. Wenhao Huang

B.S. in Mechanical Engineering (June 2007)

B.S. in Business Administration (June 2007)

PROFESSIONAL EXPERIENCE

ASSISTANT PROFESSOR

Aug 2017 - Present

- Materials Science and Engineering, New York State College of Ceramics, Alfred University, Alfred, NY,

GRADUATE RESEARCH ASSISTANT

2010 - 2017

- Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ,

GRADUATE/UNDERGRADUATE RESEARCH ASSISTANT

2006 - 2010

- Department of Mechanical Engineering, University of Science and Technology of China, Hefei, China,

RESEARCH EXPERIENCE

ALFRED UNIVERSITY

Alfred, NY

- *Growth mechanism of two-dimensional nanomaterials,*
 - *Highly stretchable electrodes with one-dimensional and two-dimensional nanomaterials,*
 - *Flexible energy storage including supercapacitors and batteries*
-

- *Additive Manufacturing for scalable nanomanufacturing – inkjet printing, direct ink writing*

STEVENS INSTITUTE OF TECHNOLOGY Hoboken, NJ
 Graduate Researcher, Nanomechanics and Nanomaterial Laboratory (2010 - 2017)

- *Vibration energy harvesting of circular polymer membranes*
- *Laser interference lithography from system to applications*
- *Functional graphene for flexible electrodes*
- *Nanoconfined Polymer Electrolytes for Rechargeable Thin Film Lithium-ion Batteries*
- *Rapid prototyping for Senior Design projects and course of Advanced Additive Manufacturing*

BROOKHAVEN NATIONAL LABORATORY Upton, NY
 Guest Researcher, Center for Functional Nanomaterials 2013 - 2015

- *Large-area nanofabrication for porous metallic alloy nanostructures*
- *Wavelength dependence of large area (CVD) graphene based photo-detectors*

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA Hefei, China
 Graduate/Undergrad Research Assistant, Micro/Nano Engineering Laboratory (2006 - 2010)

- *Femtosecond laser micro 3D fabrication for functional devices*

TEACHING EXPERIENCE

ALFRED UNIVERSITY Alfred, NY
 Assistant Professor, Materials Science and Engineering (Aug 2017 - current)

- *MECH 417 Introduction to Finite Element Analysis (3 sections):*
 - Senior level required course for Mechanical Engineering students covers the use of the finite element method to solve problems in the areas of stress analysis, heat conduction, and fluid flow including weighted residual and variational approaches, shape functions, numerical integration, and the patch test. The focus of the class is teaching the fundamental finite element analysis theory and methods which are discipline and software independent. Examples of these finite element modeling and analysis are demonstrated in a number of areas, including solid and fluid mechanics, thermodynamics, and heat transfer. Several software packages, including finite element analysis and CAD software, are used in class.
- *CEMS 446 Mechanics of Composites (2 sections):*
 - Senior level required course for Materials Science and Engineering students covers the fundamentals in composite materials, manufacturing, the mechanical properties of composites, and their applications. The focus of the class is teaching the fundamental mechanical properties of composites, including micromechanical and macromechanical relationships of the current and future composite materials.

STEVENS INSTITUTE OF TECHNOLOGY Hoboken, NJ
 Teaching Assistant/Guest Lecture (2010 - 2017)

- *Courses:*
 - ME 345 Modeling and Simulation
 - ME 361 Design of Machine Components
 - ME 491 Manufacturing Processes and Systems

- ME 515 Automotive Engineering
- ME 566 Design for Manufacturability
- ME 631 Mechanical Vibrations I
- ME 652 Advanced Additive Manufacturing
- ME 665 Advanced Product Development
- ME 423/424 Senior Design
- ME 800 Special Problems in Mechanical Engineering

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA

Hefei, China

Teaching Assistant

(2008 – 2010)

- *Courses:*

- Intro to Nano Technology
- Mechatronics

STUDENT MENTORING

STUDENTS MENTORING AT ALFRED

- Chao Liu, PhD student, Materials Science and Engineering. “Additive Manufacturing of Nanocomposites”, Jan 2018 - present

STUDENTS MENTORED AT STEVENS

- Chao Liu, MS student, Mechanical Engineering. “Growth of Carbon Nanotubes and Graphene with APCVD and LPCVD Systems”, 2017
- Kun Tang, MS student, Mechanical Engineering. “Monolayer Graphene Growth by Low Pressure Chemical Vapor Deposition and Its Characterizations”, 2017
- Jiannan Zhao, MS student, Mechanical Engineering. “Large Single-crystal Graphene Growth on Pt”, 2016
- Zachary Binger, Junior year undergrad, Mechanical Engineering. “Monolayer Graphene Growth with LPCVD”, 2015
- Yuki Osumi, Senior High School Student, Academy for the Advancement of Science and Technology at Bergen County Academies. “Exfoliation of Graphene Patterns”, 2015

GRADUATE STUDENT COMMITTEES AT ALFRED

- Andres Garcia, MS student, Mechanical Engineering. “3D Printing of Ceramics”, Advisor: Xingwu Wang
- Andrew King, MS student, Materials Science and Engineering. “Investigation into the Synthesis of a Stoichiometrically Controlled Alloy of Nickel and Titanium”, Advisor: Steven Tidrow
- Yiyu Li, PhD candidate, Materials Science and Engineering. “Study on Consolidation of Sulfide-Based Infrared Optical Ceramics”, Advisor: Yiquan Wu

SERVICE

DEPARTMENT/ COLLEGE SERVICE

- Committee Member, MSE Faculty Search Committee. (October 31, 2017 - Present)
- Committee Member, Graduate Admission Committee. (February 5, 2018 - Present)
- Committee Member, New York State College of Ceramics Research Committee (2018 - 2020)

PROFESSIONAL SERVICES

- 2017 Panelist in Materials Engineering, NSF Graduate Research Fellowship Program (GRFP)
- 2017 Guest Editor, Elsevier Journal *Nano-Structures & Nano-Objects* (NANOSO)

- 2017 Session Co-Chair, “Micro and Nano Systems for Biological and Biomedical Applications”, 2017 ASME International Mechanical Engineering Conference and Exposition (IMECE), Oct 3 – Oct 9, Tampa, FL
- 2015, 2016, 2017, 2018 Program Committee for the *Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication* (EIPBN)

HONORS AND AWARDS

- 2017 Research Discretionary Funding, Alfred University, \$20,000
- 2016 Stevens Ph.D. Conference Funding (among six recipients institute wide)
- 2016 National Science Foundation (NSF) for the American Society of Mechanical Engineers (ASME) Travel Award
- 2014, 2015 EIPBN Student Travel Grant (2014, 2015)
- 2014, 2015 Stevens Graduate Conference Fund (2014, 2015)

MEMBERSHIP

- Member of the American Society of Mechanical Engineering (ASME)
- Member of the American Vacuum Society (AVS)
- Member of the Materials Research Society (MRS)
- Member of the New York Academy of Sciences (NYAS)

RESEARCH PUBLICATIONS AND CONFERENCES

BOOK CHAPTER

1. **J. Ding**, V. R. Challa, M. G. Prasad, F. T. Fisher (2013). Vibration Energy Harvesting and Its Application for Nano- and Microrobotics, *in Selected Topics in Micro/Nano-robotics for Biomedical Applications*. Y. Guo, Springer New York: 59-83.

US PATENT

1. R. Zhang, **J. Ding**, and E. H. Yang, “Stretchable Supercapacitors with Vertically-Aligned Embedded Carbon Nanotubes”, US Patent Pending: Patent Application No. 62/500,641

JOURNAL ARTICLES

1. K. Du, **J. Ding**, I. Wathuthanthri, and C.-H. Choi, “Optofluidics waveguide platform based on sharp tip superhydrophobic surfaces”, in preparation
2. **J. Ding**, K. Du, F. T. Fisher, and E. H. Yang, “Carbon nanomaterials for stretchable electrodes towards flexible electronics”, in preparation
3. **J. Ding**, I. Wathuthanthri, K. Du, F. T. Fisher, and C.-H. Choi, “Modeling and fabrication of hierarchy nanostructures using Moiré holographic lithography”, in preparation
4. Z. Zhang, **J. Ding**, B. M. Ocko, J. Lhermitte, J. Strzalka, C.-H. Choi, F. T. Fisher, K. G. Yager, and C. T. Black, “Nanoconfinement and salt synergistically suppress crystallization in polyethylene oxide”, under review
5. Z. Zhang, **J. Ding**, B. M. Ocko, A. Fluerasu, L. Wiegart, Y. Zhang, J. Lhermitte, Y. Tian, C.-H. Choi, F. T. Fisher, K. G. Yager, and C. T. Black, “Nanoconfinement-induced strengthening of polyethylene oxide”, under review
6. R. Zhang, **J. Ding**, C. Liu, and E. H. Yang, “Highly stretchable supercapacitors enabled by interwoven CNTs partially embedded in PDMS”, *ACS Applied Energy Materials*, 2018

7. K. Du, Y. Jiang, P. Huang, **J. Ding**, T. Gao, C.-H. Choi, “Self-formation of polymer nanostructures in plasma etching: Mechanisms and applications”, *Journal of Micromechanics and Microengineering*, 28.1 (2017): 014006.
8. E. H. Yang, K. N. Kang, D. Datta, **J. Ding**, and G. Hader, “A Special Issue on Modeling and Nanofabrication of 1D and 2D Materials”, *Nano-Structures & Nano-Objects*, 15 (2017): 61-62
9. K. Du, **J. Ding**, I. Wathuthanthri, and C.-H. Choi, “Selective hierarchical patterning of silicon nanostructures via soft nanostencil lithography”, *Nanotechnology*, 28.46 (2017): 465303.
10. **J. Ding**, S. Fu, R. Zhang, E. Boon, W. Lee, F. T. Fisher, and E. H. Yang, “Graphene – vertically aligned carbon nanotube hybrid on PDMS as stretchable electrodes”, *Nanotechnology*, 28.46 (2017): 465302.
11. K. Du, M. Park, **J. Ding**, H. Hu, and Z. Zhang, “Sub-10 nm Patterning with DNA Nanostructures: A Short Perspective”, *Nanotechnology*, 28.44 (2017): 442501.
12. A. Chauvin, N. Stephant, K. Du, **J. Ding**, I. Wathuthanthri, C.-H. Choi, P. Tessier, A.A. El Mel, “Large-scale fabrication of porous gold nanowires via laser interference lithography and dealloying of gold-silver nano-alloys”, *Micromachines*, 8.6 (2017): 168.
13. K. Du, **J. Ding**, Y. Liu, I. Wathuthanthri, and C.-H. Choi, “Stencil lithography for scalable micro- and nanomanufacturing”, *Micromachines*, 8.4 (2017): 131.
14. A. Chauvin, C. Delacôte, M. Boujtita, B. Angleraud, **J. Ding**, C.-H. Choi, P. Tessier, and A.A. El Mel, “Dealloying of gold–copper alloy nanowires: From hillocks to ring-shaped nanopores”, *Beilstein Journal of Nanotechnology*, 7 (2016): 1361.
15. **J. Ding**, F. T. Fisher, and E. H. Yang, “Direct transfer of corrugated graphene sheets as stretchable electrodes”. *Journal of Vacuum Science and Technology B*, 34.5 (2016): 051205. [recognized by journal as a ‘most read’ article for month of October 2016, featured as a ‘editor’s pick’ article on JVST website.]
16. A.A. El Mel, M. Chettab, E. Gautron, A. Chauvin, B. Humbert, J. Mevellec, C. Delacote, D. Thiry, N. Stephant, **J. Ding**, K. Du, C.-H. Choi, and P. Tessier, “Galvanic replacement reaction: a route to highly ordered bimetallic nanotubes”, *The Journal of Physical Chemistry C*, 120.31 (2016): 17652-17659.
17. A.A. El Mel, P. Tessier, M. Buffiere, E. Gautron, **J. Ding**, K. Du, C.-H. Choi, S. Konstantinidis, R. Snyders, C. Bittencourt, and L. Molina-Luna, “Controlling the formation of nanocavities in Kirkendall nanoobjects through sequential thermal ex situ oxidation and in situ reduction reactions”, *Small*, 12.21 (2016): 2885-2892.
18. A. Chauvin, C. Delacôte, L. Molina-Luna, M. Duerrschabel, M. Boujtita, D. Thiry, K. Du, **J. Ding**, C.-H. Choi, P. Tessier, and A.A. El Mel, “Planar arrays of nanoporous gold nanowires: when electrochemical dealloying meets nanopatterning”, *ACS Applied Materials & Interfaces*, 8.10 (2016): 6611-6620.
19. D. Thiry, L. Molina-Luna, E. Gautron, N. Stephan, A. Chauvin, K. Du, **J. Ding**, C.-H. Choi, P. Tessier, and A.A. El Mel, “The Kirkendall effect in binary alloys: trapping gold in copper oxide nanoshells”, *Chemistry of Materials*, 27.18 (2015): 6374-6384.
20. **J. Ding**, K. Du, I. Wathuthanthri, C.-H. Choi, F. T. Fisher, and E. H. Yang, “Transfer patterning of large-area graphene nanomesh via holographic lithography and plasma etching”, *Journal of Vacuum Science and Technology B*, 32.6 (2014): 06FF01. [recognized by journal as a ‘most read’ article for month of October 2014.]
21. K. Kumar, Y.-S. Kim, X. Li, **J. Ding**, F. T. Fisher, and E. H. Yang, “Chemical vapor deposition of carbon nanotubes on monolayer graphene substrates: reduced etching via suppressed catalytic hydrogenation using C₂H₄”, *Chemistry of Materials*, 25.19 (2013): 3874-3879.
22. X. Wang, J. He, J. Ma, **J. Ding**, J. Chu, and W. Huang, “Resolution improvement of femtosecond laser induced two-photon polymerization based on phase filtering”, *Optical Engineering*, 50.5 (2011): 054302-054302.

CONFERENCE PROCEEDINGS (Peer Reviewed)

1. R. Zhang, **J. Ding**, C. Liu, and E. H. Yang, “Facile and high-throughput fabrication of carbon nanotube carpet-PDMS structures toward flexible supercapacitors,” *Technical Proceedings of the 2017 NSTI Nanotechnology Conference and Expo, NSTI-Nanotech*, May 14-17, 2017, Washington D.C.
2. A. Chauvin, C. Delacôte, L. Molina-Luna, M. Boujtita, D. Thiry, K. Du, **J. Ding**, C.-H. Choi, B. Humbert, J.-Y. Mevellec, P.-Y. Tessier, and A.A. El Mel, “Two-step approach for the nanofabrication of highly ordered ultra-long porous gold nanowires with an adjustable porosity for SERS-based sensors”, *The 2016 TechConnect World Innovation Conference*, May 22-25, 2016 Washington D.C.
3. L. Yang, J. Li, **J. Ding**, S. Sun, and W. Huang, “Controllable fabrication of standard involute microgears”, *The 2nd International Conference on Nanomanufacturing (nanoMan2010)*, 2010, Tianjin, China
4. **J. Ding**, Z. Zhai, J. He, J. Li, X. Wang, and W. Huang, “Micro device mould fabrication based on two-photon polymerization and electroforming”, *The 5th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (NEMS)*, 2010, Xiamen, China
5. X. Zhai, **J. Ding**, and W. Huang, “The experiment and theoretical analysis of the completely inelastic collision of microspheres and optical microrotor”, *IEEE International Conference on Control and Automation, ICCA*, 2009, Christchurch, New Zealand
6. Y. Hu, Z. Zhang, S. Lei, **J. Ding**, M. Xu, W. Huang, and Q. Zhang, “Polarization storage by two-photon absorption method in a diazobenzene/MMA copolymer”, *8th International Symposium on Optical Storage and 2008 International Workshop on Information Data Storage*, Wuhan, China
7. R. Guo, Z. Guo, J. Liu, **J. Ding**, X. Wang, and W. Huang, “Micro cutting of Madin-Darby Canine Kidney (MDCK) cell using femtosecond laser” *3rd Pacific International Conference on Applications of Lasers and Optics, PICALO 2008*, Beijing, China

CONFERENCE AND TECHNICAL PRESENTATIONS

1. R. Zhang, **J. Ding** and E. H. Yang, “Facile and high-throughput fabrication of flexible supercapacitors by using VACNT-PDMS structures,” *2017 Materials Research Society (MRS) Fall Meeting*, November 26 – December 1, Boston, MA, USA
2. R. Zhang, **J. Ding** and E. H. Yang, “Facile and high-throughput fabrication of carbon nanotube carpet-PDMS structures toward flexible supercapacitors,” *The 61st International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN 2017)*, May 30 – June 2, 2017, Orlando, FL, USA
3. R. Zhang, **J. Ding** and E. H. Yang, “Facile and high-throughput fabrication of carbon nanotube carpet-PDMS structures toward flexible supercapacitors,” *Graduate Research Conference, Stevens Institute of Technology*, February 10-11, 2017, Hoboken, NJ
4. **J. Ding**, S. Fu, E. Boon, F. T. Fisher and E. H. Yang, “Vertically aligned carbon nanotube-supported graphene as stretchable electrodes,” *Graduate Research Conference, Stevens Institute of Technology*, February 10-11, 2017, Hoboken, NJ
5. **J. Ding**, S. Fu, F. T. Fisher, and E. H. Yang. “Vertically aligned carbon nanotube-supported graphene as stretchable electrodes”, *2016 Materials Research Society (MRS) Fall Meeting*, November 27 – December 2, Boston, MA.
6. Z. Zhang, **J. Ding**, K. G. Yager, B. Ocko, F. T. Fisher, and C. T. Black. “Nanoconfined polymer electrolyte for rechargeable thin film Lithium-ion batteries”, *2016 Materials Research Society (MRS) Fall Meeting*, November 27 – December 2, Boston, MA.
7. **J. Ding**, S. Fu, E. Boon, F. T. Fisher, E. H. Yang, “Vertically aligned carbon nanotube-supported graphene as stretchable electrodes”, *2016 ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 11-17, 2016, Phoenix, AZ
8. **J. Ding**, K. Du, F. T. Fisher, E. H. Yang, “Transferring graphene nanostructures onto a transparent flexible substrate”, *The 59th International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN)*, May 26-29, 2015, San Diego, CA, USA

9. **J. Ding**, K. Du, I. Wathuthanthri, C.-H. Choi, F. T. Fisher, E. H. Yang, “Fabrication of large area graphene nanomesh using interference lithography”, *2014 ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 14-20, 2014, Montreal, Canada
10. P. Wang, **J. Ding**, E. H. Yang and P. Abadi, “Mechanics of carbon nanotube forest patterns,” *2014 ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 14-20, 2014, Montreal, Canada
11. **J. Ding**, K. Du, I. Wathuthanthri, C.-H. Choi, F. T. Fisher, E. H. Yang, “Patterning of large-area graphene nanostructures via holographic lithography and O₂ plasma etching”, *The 58th International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN)*, May 27-30, 2014, Washington DC, USA.
12. K. Du, **J. Ding**, I. Wathuthanthri, C.-H. Choi, “Patterning of high-aspect-ratio nanostructures on microtrenches using stencil lithography of free-standing tri-layer membrane”, *The 58th International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN)*, May 27-30, 2014, Washington DC, USA.
13. K. Kumar, **J. Ding**, Y. Tian, A. Pallikaras, A. Moy, M. Brew, Y. Binyamin, J. Tsaoussis, E. H. Yang, “Chemical vapor deposited graphene towards transparent electrodes”, *Faculty Poster Session, Stevens Innovation Expo – April 24, 2013*.
14. **J. Ding**, Z. Zhai, J. He, J. Li, X. Wang, W. Huang, “Micro device mould fabrication based on two-photon polymerization and electroforming”, *The 5th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (NEMS)*, 2010.

INVITED PRESENTATIONS

1. J. Ding, “Carbon Nanomaterials for Flexible Electronics”, Rochester Institute of Technology, February 15, 2018
2. J. Ding, “Nanofabrication and Nanopatterning of Carbon Nanomaterials for Flexible Electronics”, Alfred University, Alfred, NY, May 25, 2017
3. J. Ding, “Nanofabrication and Nanopatterning of Carbon Nanomaterials for Flexible Electronics”, University of North Texas, Denton, TX, May 1, 2017
4. J. Ding, “Scalable Micro- and Nanomanufacturing for Photodetector Applications”, Enablence Technologies Inc., Fremont, CA, April 11, 2017
5. J. Ding, K. Du, I. Wathuthanthri, C.-H. Choi, F. T. Fisher, E. H. Yang, “Fabrication of Large-Area Graphene Nanostructures via Holographic Nanopatterning”, Duracell Inc., Bethel, CT, August 4, 2015