Alta Fang

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Education

Princeton University
Ph.D., Mechanical and Aerospace Engineering   Nov. 2017
M.A., Mechanical and Aerospace Engineering, GPA: 3.75/4.0   Sept. 2014

California Institute of Technology
B.S., Applied Physics, GPA: 3.9/4.3   June 2012

Experience

R&D Development Engineer, Dassault Systemes – BIOVIA   Oct. 2019 – Present
- Software developer for Pipeline Pilot, focusing on supporting Python integration

NRC Postdoctoral Research Associate,   Feb. 2018 – Oct. 2019
National Institute of Standards and Technology (NIST)
Advisor: Dr. Alex Smolyanitsky
- Performed molecular dynamics simulations to study interfacial behavior of electrolytes.
- Modeled ionic liquid mixtures near carbon electrodes for supercapacitor applications and studied strain-controlled ion permeation through nanoporous 2D membranes.
- Developed a web app to predict article relevance to the Thermodynamics Research Center database using natural language processing and machine learning algorithms.

Graduate Researcher, Princeton University   Sept. 2012 – Nov. 2017
Advisor: Prof. Mikko Haataja
- Developed phase-field models of microstructural evolution during crystallization.
- Modeled spherulitic and dendritic growth in organic thin films, showing that a combination of thermodynamic and kinetic effects leads to a variety of complex morphologies.
- Developed models for template-assisted nanowire electrodeposition and analyzed nanowire length distributions; modeled lithium metal plating in lithium-ion batteries.

Summer Undergraduate Researcher, Caltech   Summers 2009, 2010, 2011, 2012
- Improved software for measuring ground deformation using optical satellite and aerial images for the COSI-Corr project.
- Performed experiments and simulations to study the effects of surface nanostructures on GaAs solar cell performance in Prof. Harry Atwater's group.
- Developed software in Python for solving optimization problems in Prof. Brent Fultz's group.

Teaching and Mentoring Experience

Teaching Assistant, Princeton University
- MAE223: Solid Mechanics   Fall 2015, Fall 2016

- MAE206: Engineering Dynamics   Spring 2014, Spring 2017

Teaching Transcript, McGraw Center, Princeton University   2017

Graduate Student Mentor, Princeton University

- Sarah Morgeson, undergraduate student researcher   Summer 2014

Awards and Honors

NRC Postdoctoral Research Associateship	2018-2020
National Science Foundation Graduate Research Fellowship	2012-2013 & 2014-2016
MAE Research Day Best Presentation	2014
Larisse Rosentweig Klein Memorial Award	2014
Phillips Second Year Fellowship	2013
Gordon Y.S. Wu Graduate Fellowship in Engineering	2012
Kavli Nanoscience Institute Summer Fellowship	2011

Publications

11. A. Smolyanitsky, **A. Fang**, A. F. Kazakov, E. Paulechka, "Ion Transport Across Solid-State Ion Channels Perturbed by Directed Strain", *Nanoscale* (2020).

10. **A. Fang**, A. Smolyanitsky, "Large Variations in the Composition of Ionic Liquid-Solvent Mixtures in Nanoscale Confinement", *ACS Applied Materials & Interfaces*, 11, 30, 27243-27250 (2019).

9. **A. Fang**, K. Kroenlein, A. Smolyanitsky, "Mechanosensitive Ion Permeation across Subnanoporous MoS_2 Monolayers", *Journal of Physical Chemistry C*, 123, 6 (2019).

8. **A. Fang**, A. Smolyanitsky, "Simulation Study of the Capacitance and Charging Mechanisms of Ionic Liquid Mixtures near Carbon Electrodes", *Journal of Physical Chemistry C*, 123, 3 (2019).

7. **A. Fang**, K. Kroenlein, D. Riccardi, A. Smolyanitsky, "Highly Mechanosensitive Ion Channels from Graphene-Embedded Crown Ethers", *Nature Materials* 18, 76-81 (2019).

6. X. M. Liu, **A. Fang**, M. Haataja, C. B. Arnold, "Size Dependence of Transport Non-Uniformities on Localized Plating in Lithium-Ion Batteries", *Journal of the Electrochemical Society* 165.5, A1147-A1155 (2018).

5. **A. Fang**, M. Haataja, "Electrodeposition Kinetics in Porous Templates", *Journal of the Electrochemical Society* 164.13, D875-D887 (2017).

4. **A. Fang**, M. Haataja, "Simulation Study of Twisted Crystal Growth in Organic Thin Films", *Physical Review E* 92, 042404 (2015).

3. **A. Fang**, A. K. Hailey, A. Grosskopf, J. E. Anthony, Y.-L. Loo, M. Haataja, "Capillary Effects in Guided Crystallization of Organic Thin Films", *APL Materials*, 3, 036107 (2015).

2. **A. Fang**, M. Haataja, "Crystallization in Organic Semiconductor Thin Films: A Diffuse-Interface Approach", *Physical Review E* 89, 022407 (2014) [Editor's Suggestion].

1. M. M. McKerns, L. Strand, T. Sullivan, **A. Fang**, M. A. G. Aivazis, "Building a Framework for Predictive Science", *Proceedings of the 10th Python in Science Conference* (2011).

Presentations

7. **A. Fang** and A. Smolyanitsky, "Modeling Variations in the Composition of Ionic Liquid-Solvent Mixtures Confined Inside Nanopores", ACS National Meeting & Exposition, San Diego, CA, August 2019. Oral presentation.

6. **A. Fang** and A. Smolyanitsky, "Atomistic Modeling of Ionic Liquid Mixtures as Electrolytes in Electrochemical Capacitors", MRS Spring Meeting & Exhibit, Phoenix, AZ, April 2019. Poster presentation.

5. **A. Fang** and A. Smolyanitsky, "Modeling the Effects of Ionic Liquid Mixtures on Electrochemical Capacitor Performance", ACS National Meeting & Exposition, Boston, MA, August 2018. Oral presentation.

4. **A. Fang** and M. Haataja, "Modeling Electrodeposition through Porous Battery Separators", The Fifth International Education Forum on Environment and Energy Science, San Diego, CA, December 2016. Oral presentation.

3. **A. Fang** and M. Haataja, "Modeling Electrodeposition in Porous Templates", MRS Fall Meeting & Exhibit, Boston, MA, November 2016. Poster presentation.

2. **A. Fang** and M. Haataja, "Phase-field Modeling of Metal Plating on Battery Electrodes", 229th ECS Meeting, San Diego, CA, June 2016. Poster presentation.

1. **A. Fang** and M. Haataja, "Diffuse-interface Modeling of Crystallization in Organic Thin Films", TMS 2015 Annual Meeting and Exhibition, Orlando, FL, March 2015. Oral presentation.

Service

Peer reviewer for *Computational Materials Science, Carbon, ACS Applied Materials & Interfaces, Molecular Physics, RSC Advances, Journal of Physical Chemistry C*	
Princeton University Graduate Student Government representative for MAE	2014-2016
Volunteer with Princeton Young Achievers	2014-2015
Volunteer tutor with the Caltech Y's RISE program	2008-2012

Skills

Programming:	Python, C, C++, MATLAB; object-oriented code design
Tools:	git, perforce, Unix, OpenMP, MPI, hdf5, Mathematica, LaTeX, LAMMPS
Theoretical:	computational materials science, molecular dynamics, phase-field modeling, numerical methods, ordinary and partial differential equations, electrochemical systems, scientific software development, machine learning