

Meng (Stephanie) Shen, PhD

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PROFESSIONAL EXPERIENCE

- 2020-
Present **Assistant Professor**
California State University, Fullerton, California
Department of Physics
- 2018-2020 **Postdoctoral Scholar**
The University of Chicago, Chicago, Illinois
Pritzker School of Molecular Engineering (IME)
- 2016-2018 **Postdoctoral Researcher**
Northwestern University, Evanston, Illinois
Department of Materials Science Engineering
- 2014-2015 **Postdoctoral Fellow**
Northwestern University, Evanston Illinois
Department of Mechanical Engineering

EDUCATION

- 2008-2013 **Rensselaer Polytechnic Institute (RPI)**, Troy, NY, USA
Ph.D. in Materials Science and Engineering
Thesis project: Tunable interfacial thermal conductance
Advisor: Prof. Pawel Keblinski
- Fudan University**, Shanghai, China
- 2005-2008 M.S. in Materials Physics
- 2001-2005 B.S. in Materials Physics

RESEARCH AREAS AND INTERESTS

Computational soft matter, bio-interfaces, electrostatics, heat and mass transfer, membrane filtration, mechanical metamaterials, soft robotics, machine learning, energy and environmental sustainability.

SELECTED RESEARCH GRANTS

2021	CSUF Junior Senior Grants (\$4999)
2021-2022	CSUF Summer 2021 Grant for Faculty Support on Scholarly or Creative Productivity (\$5000)
2021-2022	XSEDE Covid-19 Consortium Award (30,000 SU)
2020-2021	XSEDE Startup Award (10,000 SU)

GRANT PROPOSAL EXPERIENCES

2021	“Understanding Polypyrrole for Selective Removal of Oxyanions from Water”, PI of XSEDE research allocation application.
2021	“Interplay between COVID-19 viruses and contact surfaces in the built environment”, PI of XSEDE Covid-19 consortium application.
2021	“Understanding and designing surface materials for removal of viral pathogens”, PI of Junior/Senior Grant at CSUF.
2021	“Understanding collective motion by machine learning and physics-based modeling”, PI of Summer Grant at CSUF.
2021	“Collaborative Research: Interplay between viral pathogens and contact surfaces to elucidate fomite transmission in the built environment”, co-PI of NSF proposal.
2020	“The effects of electrostatics on the filtration of aerosols”, PI of XSEDE startup allocation application.
2014	“Nanoscale Physics of Reverse Osmosis Membrane Filtration”, co-PI of a research allocation computational award granted by XSEDE.

HONOR AND AWARD

2015	Elias Klein Founders' Travel Award from North American Membrane Society.
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PEER-REVIEWED PUBLICATIONS

1. C. Sun, **M. Shen**, A. D. Chavez, A. M. Evans, X. Liu, B. Harutyunyan, N. C. Flanders, M. C. Hersam, M. J. Bedzyk, M. Olvera de la Cruz and William R. Dichtel, “High aspect ratio nanotubes assembled from macrocyclic iminium salts”, *PNAS*, (2018).
2. **M. Shen**, “Towards the systematic control of the exfoliation of atomically thin layered materials by electrostatics”, *ACS Central Science*, 4, 142-143 (2018).
3. Y. Li, M. Girard, **M. Shen**, J. A. Millan and M. Olvera de la Cruz, “Strong attractions and repulsions mediated by monovalent salts”, *PNAS* 114, 11838-11843 (2017).
4. **M. Shen**, H. Li and M. Olvera de la Cruz, “Surface Polarization Effects on Ion-Containing Emulsions”, *Phys. Rev. Lett.* 119, 138002 (2017).
5. **M. Shen**, S. Keten and R. Lueptow, “Rejection mechanisms for contaminants in polyamide reverse osmosis membranes”, *J. Membr. Sci.* 509, 36-47 (2016).
6. **M. Shen**, S. Keten and R. Lueptow, “Dynamics of water flux and contaminant rejection in polymeric reverse osmosis membranes via molecular dynamics simulations”, *J. Membr.*

- Sci.* 506, 95-108 (2016).
7. J. Yang, **M. Shen**, et al., “Phonon transport through point contacts between graphitic nanomaterials”, *Phys. Rev. Lett.* 112, 205901 (2014).
 8. **M. Shen** and P. Keblinski, “Ballistic vs. diffusive heat transfer across nanoscopic films of layered crystals”, *J. Appl. Phys.* 115, 144310 (2014).
 9. **M. Shen**, P. K. Schelling and P. Keblinski, “Heat transfer mechanism across few-layer graphene by molecular dynamics”, *Phys. Rev. B* 88, 045444 (2013).
 10. W. Evans, **M. Shen** and P. Keblinski, “Thermal transport in carbon nanotubes arrays and bundles: Effects of contact area and pressure”, *Appl. Phys. Lett.* 100, 261908 (2012).
 11. **M. Shen**, W. Evans, D. G. Cahill and P. Keblinski, “Bonding and pressure tunable interfacial thermal conductance”, *Phys. Rev. B*, 84, 195432 (2011).
 12. D. H. Wu, **M. Shen**, X. F. Shao, et al., “EOS Failure Analysis and Die Attach Optimizing Research of Chips”, *Chinese Journal of Semiconductors*, Vol. 29, No.2, 381-386 (2008).
 13. **M. Shen**, T. Hua, B. X. Shao and J. Wang, “Influence of IMC Growth on Reliability of Lead-Free Solder Balls”, *Semiconductor Technology*, Vol. 32, No. 11, 929-932 (2007).

PUBLICATIONS IN PROGRESS

14. “Poisson’s ratio and angle bending in spring networks”, N. Pashine, D. Reid, **M. Shen**, J. J. de Pablo and S. Nagel (submitted in 2021). (preprint: arXiv:2104.03198)

CONTRIBUTED CONFERENCE PRESENTATIONS AND POSTERS

- L. Kong, **M. Shen** and X. Liu, “Hydrophobic conductive polymer modified anion exchange membrane for selective nitrate separation in membrane capacitive deionization”, ACS Fall Meeting, Atlanta 2021, Georgia.
- **M. Shen**, “Interfacial tension and wettability of water solution on hydrophilic and hydrophobic surfaces”, APS March Meeting 2021, online.
- **M. Shen**, S. Nagel and J. J. de Pablo, “Tuning Auxetic Properties of Networks by the Bending Resistance”, GRS and GRC on Soft Matter 2019, New London, NH.
- **M. Shen**, N. Pashine, S. R. Nagel and J. J. de Pablo, “The effects of torsion and bending resistance on auxetic 3D networks”, APS March Meeting 2019, Boston, MA.
- **M. Shen**, H. Li and M. Olvera de la Cruz, Oral presentation, “The effects of interfacial polarization on long-range interaction between aqueous phases in oil”, APS March Meeting 2017, New Orleans, LA.
- R. M. Lueptow and **M. Shen**, Oral presentation, “Ångström-Scale Molecular Interactions in Reverse Osmosis Membranes”, 2016 Gordon Research Conference on Membranes: Materials and Processes, New London, NH.
- **M. Shen**, S. Keten and R. M. Lueptow, Oral presentation, “Molecular dynamics simulations of water and contaminant transport in RO membranes: size and structural effects”, 2015 North American Membrane Society (NAMS 2015), Boston, MA.
- **M. Shen**, S. Keten and R. M. Lueptow, Poster, “Molecular dynamics simulations of water and contaminant transport in RO membranes: chemistry effects”, 2015 North American Membrane Society (NAMS 2015), Boston, MA.

- **M. Shen**, S. Keten and R. M. Lueptow, Oral presentation, “Organic solute transport through polymeric reverse osmosis (RO) membranes by molecular dynamics simulations”, 2014 North American Membrane Society (NAMS 2014), Houston, TX.
- **M. Shen**, P. K. Schelling and P. Keblinski, Oral presentation, “Ballistic to diffusive heat transfer mechanism across layered interfaces by molecular dynamics”, 2013 Materials Research Society (MRS) Spring Conference, San Francisco, CA.
- **M. Shen**, W. Evans and P. Keblinski, Poster, “Interfacial thermal conductance between single-walled carbon nanotubes and between multi-walled carbon nanotubes”, 2012 PHONONS conference, Ann Arbor, MI.
- **M. Shen**, W. Evans and P. Keblinski, Poster, “Bonding and pressure tunable interfacial thermal conductance”, 2011 Air Force Conference, Washington DC.
- W. Evans, **M. Shen** and P. Keblinski, Poster, “Tunable Thermal transport in carbon nanotubes arrays and bundles”, 2011 Air Force Conference, Washington DC.
- **M. Shen**, W. Evans and P. Keblinski, Oral presentation, “Tunable interfacial thermal conductance”, 2011 Materials Research Society (MRS) Spring Conference, San Francisco, CA.

INVITED TALKS AND COLLOQUIA

- “Tuning Electrostatic-Mediated Self-Assembly Beyond the Classical Theory”, California State University, Fullerton, Physics Club, Fullerton, CA (Oct. 2020).
- “Computational physics in materials design: bottom-up and top-down approaches”, California State University, Fullerton, Dept. of Physics, Fullerton, CA (Oct. 2020).
- “The understanding and design of composite soft materials”, University of California, Merced, Dept. of Physics, Merced, California (Dec. 2019).
- “The Rational Design of Auxetic Networks”, University of Illinois at Chicago, Dept. of Chemical Engineering, Chicago, Illinois (Aug. 2019).
- “The Challenges and Opportunities of Electrostatics in Emulsions and Polymers”, University of Illinois at Chicago, Dept. of Chemical Engineering, Chicago, Illinois (Jul. 2018).
- “Electrostatic Interactions of Colloids and Emulsions: The Effects of Salt and Polarization”, California Institute of Technology, Los Angeles, California, (Apr. 2018).
- “Exploring the Electrostatic Interactions of Colloids and Emulsions”, University of Illinois at Chicago, Dept. of Physics, Chicago, Illinois (Feb. 2018).
- “Molecular dynamics simulations of soft matter with electrolytes”, The University of Chicago, The Institute for Molecular Engineering, Chicago, Illinois (Jun. 2017).

MEDIA COVERAGE

2017 “Understanding Rare Earth Emulsions”,
<https://www.mccormick.northwestern.edu/news/articles/2017/10/understanding-rare-earth-emulsions.html>, highlighted on the Department of Defense (DOD) University Research page.

TEACHING

California State University Fullerton

- 2021 Fall Solid State Physics (PHYS 554/454)
Developing course materials and instructing upper division and graduate students
- 2021 Spring Fundamentals of Physics: Mechanics (PHYS 225)
Optimized interactive course materials for online teaching
- 2020 Fall Fundamentals of Physics: Mechanics (PHYS 225)
Developed interactive lectures and assessments for online teaching

STUDENT ADVISING

- 2020-present Alex Kemnitz, Graduate Researcher, winner of Dan Black Scholarship,
“Understanding the Interaction between Viruses and Surfaces”
- 2020-present Eric Palacios, Undergraduate Researcher,
“The Ion Transport Mechanisms in Ion-Exchange Membranes”

UNIVERSITY AND DEPARTMENT SERVICES

- 2020-present Organizing colloquium series in the Dept. of Physics, CSUF
- 2021-present Member of Developing Curriculum Committee (DCC) at CSUF

PROFESSIONAL SERVICES

- 2019: Discussion leader at Gordon Research Seminar on Soft Matter 2019, in session:
Materials, Structures and Design
- 2018-present: ACS Central Science
- 2017-present: Journal of Membrane Science
- 2014-present: Reviewer, The Journal of Applied Physics

SCIENTIFIC OUTREACH

- 2018 Summer school tutor in the Department of Chemical Engineering at University of Illinois,
Chicago (UIC)
- 2012 Tutor to guide high school girls to science and engineering in the Design Your Future
Day program, Troy, NY.

PROFESSIONAL MEMBERSHIP

- American Physical Society**, Topical Group on Quantum Information, Topical Group on Physics
Education Research, Forum on Education, 2016-present
- American Association of Physics Teachers**, 2020-present