Xiaojia J. Xu • Curriculum Vitae

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Research Interests

Biophysics & biomechanics. Emergent phenomena and collective behavior in active matter.

Education

2019 - **Ph.D. in Physics**, Yale University, New Haven, CT

2015 - 2019 **B.A. in Physics** with Highest Honors, Vanderbilt University, Nashville, TN
- Thesis: "Web-based application of the Cellular Force Inference Toolkit (CellFIT)"
- Advisor: Professor M. Shane Hutson

Publications and Talks

Journal articles

2018 Daniel Kidd, **Xiaojia Xu**, Cody Covington, Kazuyuki Watanabe, Kalman Varga, "Simulation of laser-induced rectification in a nanoscale vacuum-tube diode", *Journal of Applied Physics* 123, 054501. DOI: 10.1063/1.5019259

Talks

2019 American Physical Society March Meeting, Boston, *Contributed talk*
Web-based application of the Cellular Force Inference Toolkit (CellFIT)

2018 American Physical Society March Meeting, Los Angeles, *Contributed talk*
Simulation of Laser-Induced Rectification in a Nano-scale Diode Model

2017 Vanderbilt Undergraduate Research Fair, *Poster presentation*

2017 Vanderbilt Summer Science Academy 15th Annual Research Symposium, *Poster presentation*

2017 Vanderbilt Physics & Astronomy Summer Symposium, *Oral presentation*

Research Experiences

Nov 2019 - **Biomechanics and Control Lab**, Yale University.
Advisor: Madhusudhan Venkadesan.
• Studying stiffness modulation in fish fins and theory of elasticity; the differential geometry of shape-shifting thin sheets made of active materials; statistical mechanics of glassy transitions in muscles.

July 2018 - May 2019 **Biophotonics Lab**, Vanderbilt University.
Advisor: M. Shane Hutson.
• Studied spatial and temporal variations in cellular forces during wound healing in Drosophila epithelia.

Aug - Dec 2017 **Center for Molecular and Atomic Studies at Surfaces**, Vanderbilt University.
Advisor: Norman Tolk.
• Assisted with ultrafast pump-probe experiments that were focused on generation and detection of coherent acoustic phonons in GaAs and GaP.

Apr - Aug 2017 **Computational Condensed Matter Physics Group**, Vanderbilt University.
Advisor: Kalman Varga.
• Worked on time-dependent density functional theory simulations of a nano-scale vacuum-tube diode.

Jan 2016 – Apr 2017 **Atmospheric Physics Group**, Vanderbilt University.
Advisor: Ralf Bennartz.
• Assisted with developing a software for sorting images of ice aggregates (snowflakes) and producing particle size distributions.

Honors, Awards and Funding

2019 Phi Beta Kappa
2019 The Newton Underwood Award ($500)
2019 Vanderbilt Undergraduate Conference Travel Award ($1150)
2018 Vanderbilt Undergraduate Conference Travel Award ($1000)
2017 Summer undergraduate research funding received from Professor Kalman Varga's National Science Foundation grants OISE 1261117 and PHY 1314463 ($5000)
2015-18 Dean's List, College of Arts and Science, Vanderbilt University
2016-17 Undergraduate research funding received from Professor Ralf Bennartz ($2900)

Teaching and Tutoring

2019 - Department of Physics, Yale University
Teaching Fellow
• PHYS 180 & 181: University Physics

2017 - 2019 Department of Physics and Astronomy, Vanderbilt University
Teaching assistant
• PHYS 1501 & 1502: Physics for the Life Sciences
• PHYS 1601 & 1602: General Physics

2017 - 2019 Vanderbilt Tutoring Services
Physics and mathematics tutor
• Classical mechanics, thermodynamics, electricity and magnetism
• Calculus, linear algebra, differential equations

2018 Varsity Tutors
Calculus and programming tutor

2016 Vanderbilt Student Volunteers for Science
7th grade geology teacher

Skills

• Proficiency in Python, Bash and LaTeX. Familiarity with Fortran 90, C, Java, HTML, MATLAB, IDL, Mathematica.
• Familiarity with parallel computing APIs: OpenMP, MPI, CUDA.
• Experience with computing clusters (e.g. ACCRE, UNIX cluster environment).
• Experience with setting up high-speed cameras, sun photometers and ultrafast pump-probe experiments.
• Languages: Fluency in English and Mandarin Chinese; elementary proficiency in Canadian French.

Clubs and Societies

2019 - Yale Climbing Team
2019 - Yale Triathlon Club
2018 - USA Climbing, open competitor
2017 - American Physical Society, member
2017 - 2019 Vanderbilt Climbing Club, captain and founder
2018 - 2019 Sigma Pi Sigma Physics Honor Society, Vanderbilt Chapter, member
2018 - 2019 Vanderbilt Society of Physics Students, webmaster
2016 - 2019 Vanderbilt Outdoor Recreation Center, climbing wall instructor
Zeta Beta Tau Fraternity, Alpha Gamma

Community Service

2018 American Physical Society Office of Government Affairs
I contributed to an advocacy initiative, which concerns the PROSPER Act, by asking the Senate not to include a new loan structure that would increase student loan debt in its version of the bill.

2016-2017 Alpha Phi Omega National Service Fraternity, Vanderbilt Chapter member
I engaged in weekly service activities for the local and national communities, including, but not limited to: Nashville Rescue Mission, Nashville Humane Association and Second Harvest Food Bank.

2016 Vanderbilt Alternative Spring Break (ASB) service trip participant
With a group of Vanderbilt students, I volunteered at Challenge Enterprises, a facility that provides opportunities for individuals with disabilities.

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http://xj-xu.github.io