Xiaojia J. Xu • Curriculum Vitae

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Born November 15, 1996 in Shenzhen, China
Chinese citizen, Canadian permanent resident

Research interests

Biophysics & condensed matter
I am particularly interested in studying active matter systems that exhibit emergent phenomena, such as collective behavior and self-organization. Examples of these systems include, but is not limited to: wound healing in Drosophila epithelia and flocking of starlings.

Education

2015 - 2019 **B.A. in Physics** with Honors, Vanderbilt University (Expected)
- Thesis: "Web-based application of the Cellular Force Inference Toolkit (CellFIT)"
- Thesis advisor: Professor M. Shane Hutson
- Physics GPA: 3.9/4.0
- Minors: Scientific Computing; Earth and Environmental Science.

2011 - 2015 **GCE A-Levels**, Shenzhen College of International Education
- A-Levels in Physics, Mathematics, Biology and Geography

Publications & 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, submitted abstract for contributed talk
2018 American Physical Society March Meeting, Los Angeles, *Contributed talk*
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 experience

July 2018 - now **Biophotonics Lab**, Vanderbilt University.
Advisor: Professor M. Shane Hutson.
• Currently working on an updated web-based application of the Cellular Force Inference Toolkit (CellFIT) that allows users to access the software from a browser. The goal is to

apply the web-based CellFIT to time-resolved image stacks of wound healing in Drosophila epithelia and see the spatial and temporal variations in cellular forces as the wounds close.

Aug - Dec 2017 **Center for Molecular and Atomic Studies at Surfaces**, Vanderbilt University.
Advisor: Professor Norman Tolk.
• I studied ultrafast dynamics in condensed matter systems using pump probe spectroscopy. I assisted with carrying out experiments and doing data analysis.

Apr - Aug 2017 **Computational Condensed Matter Physics Group**, Vanderbilt University.
Advisor: Professor Kalman Varga.
• Time-dependent density functional theory simulations of nanoscale systems.

Jan 2016 – Apr 2017 **Atmospheric Physics Group**, Vanderbilt University.
Advisor: Professor Ralf Bennartz.
• I learned to develop software for processing data from a Multi-Angle Snowflake Camera and helped to set up a sun photometer as part of the NASA Aerosol Robotic Network.

Other academic experiences

June 2018 Summer School at the Center for the Physics of Biological Functions, Princeton University
• Physics of Life Summer School

June - Aug 2013 Summer College, Stanford University
• Introductory physics sequence: PHYSICS 21S, 23S, 25S with lab

Honours, awards & funding

2018 Vanderbilt Undergraduate Conference Travel Award ($1000)

2017 Summer undergraduate research funding received ($5000) from Professor Kalman Varga's NSF grants OISE 1261117 and PHY 1314463

2015-18 Dean's List, College of Arts and Science, Vanderbilt University

2016-17 Undergraduate research funding received ($2900) from Professor Ralf Bennartz

2012 Bronze Award, United Kingdom Senior Mathematical Challenge

2012 Highest score, Cambridge IGCSE Geography

2010 1^{st} Place, University of Waterloo Gauss Mathematics Contest

Teaching & tutoring

Aug 2017 - now Vanderbilt Tutoring Services
• Physics and mathematics tutor
• Classes tutored:
Physics for the Life Sciences (PHYS 1501, 1502)
General Physics (PHYS 1601, 1602)
Principles of Physics (PHYS 1911)
Single-variable and Multivariable Calculus (MATH 1300, 1301, 2300)
Methods of Linear Algebra (MATH 2410)
Methods of Ordinary Differential Equations (MATH 2420)

Aug 2017 - Aug 2018 Department of Physics and Astronomy, Vanderbilt University
• Grader and help desk tutor
• Physics for the Life Sciences (PHYS 1501, 1502) and General Physics (PHYS 1601, 1602)

May - Aug 2018 Varsity Tutors
• Calculus and programming tutor

Jan - Apr 2016 Vanderbilt Student Volunteers for Science
• 7th grade geology teacher

Skills

• Proficiency in Python, Fortran (f90), Bash. Familiarity with C, Java, HTML, MATLAB, IDL.
• Familiarity with parallel computing APIs: OpenMP, MPI, CUDA.
• Experience with computing clusters (e.g. ACCRE, UNIX cluster environment).

Standardized test scores

• GRE Verbal: 162 (91st percentile); GRE Quantitative: 166 (91st); GRE Writing: 5.0 (93rd)
• SAT Reading: 750 (98th percentile); SAT Math: 800 (99th); SAT Physics: 800 (89th)

Sports

Vanderbilt Climbing Club
• Captain of the climbing team competing in the USA Climbing Collegiate Series
• Founder and president of the club
Shenzhen Longboard downhill skateboarding team rider
• 4th place at the 2016 Sanzhoutian Cup (biggest race in Southern China at the time)
SCIE (high school) varsity soccer team captain

Employment

June 2016 – now Vanderbilt Outdoor Recreation Center
• Climbing wall staff • Equipment specialist • Trip coordinator

Societies

• American Physical Society, undergraduate member
• Sigma Pi Sigma Physics Honor Society, Vanderbilt Chapter, member
• Vanderbilt Society of Physics Students, Webmaster

Community Service

2016-2017 Alpha Phi Omega National Service Fraternity, Vanderbilt Chapter member
2016 Vanderbilt Alternative Spring Break (ASB) service trip participant

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http://xj-xu.github.io