# Ashley Gannon | Curriculum Vitae

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## Education

- **Ph.D. Candidate in Scientific Computing | 3.925/4.00** — **Tallahassee, Fl**
  *Department of Scientific Computing, Florida State University* — *2017–2022*
  Expected August-December 2022
- **M.S. STEM Teaching** — **Tallahassee, Fl**
  *Department of Education, Florida State University* — *2020–2022*
  Expected May 2022
- **B.S. in Chemical & Biomedical Engineering** — **Tallahassee, Fl**
  *Department of Chemical & Biomedical Engineering, Florida State University* — *2015–2017*
- **B.S. in Biological Sciences** — **Tallahassee, Fl**
  *Department of Biological Sciences, Florida State University* — *2012–2015*

### Research Experience

- **Graduate Research Assistant** — **Tallahassee, Fl**
  *Florida State University, Office of STEM Teaching Activities* — *October 2017 - August 2021*
  This project is an NSF funded collaboration between middle-school mathematics teachers, FSU Computer Science (CS) faculty, and STEM education faculty to design, develop, and implement CS modules into general middle school mathematics courses in the Tallahassee area. This project exposes a larger, more diverse student body to CS concepts, while current modules mostly supplement advanced math courses. My role is to aid in the development of the CS modules and supplementary games, collect and analyze data, write peer-reviewed articles, and deliver talks at conferences.

- **Graduate Research Assistant to Dr. Quaife** — **Tallahassee, Fl**
  *Florida State University, Department of Scientific Computing* — *Current*
  I use models to study the surface physics of biomembranes such as red blood cells. My work involves developing numerical methods to simulate multi-component, semipermeable, adhesive biomembranes in various open and constricted flow regimes.

- **Undergraduate Research Assistant to Dr. Zhu** — **Tallahassee, Fl**
  *Florida State University, Center for Brain Repair* — *Oct. 2013 - Oct. 2015*
  I aided in developing a mouse model for attention deficit hyperactivity disorder (ADHD). Our model demonstrated that hyperactivity and working memory deficits are associated with two specific types of dopamine receptors. We also showed that exposing the developing brain to nicotine increases the risk of offspring developing ADHD and that this behavior may be transmitted generations. I designed and conducted qualitative and quantitative experiments in-vivo and in-vitro including protein binding assays using Sulfur 35, western blots, nuclei extraction, and gel electrophoresis. I also designed and conducted behavioral model experiments for mice, extracted and prepared brain tissue for experiments, and analyzed data extracted from experiments.

## Outreach Activities

- **Founder/Director** — **Oct. 2019 - Present**
  *Create with Code! Summer Camp Program* — *Tallahassee, Fl*

  Working with the Department of Scientific Computing and the Office of STEM Teaching Activities, I developed three one week long summer programs, *Create with Code!*, that were offered in the summer of 2021. *Create with Code!* is a free summer camp for Florida high-school students who are interested in science and programming. This program introduces students to Python for data visualization and analysis and machine learning. During the first week of camp, students are taught the basics of Python. In the second week, students explore FSU's Geophysical Fluid Dynamics Institute, seeing the wave tank in action. Students analyze data from the wave tank and related results to smoke dispersion from the 2018 Campfire using air quality index data. In the third week, students dive into the world of deep learning. During this week, students build their own neural network to classify data, optimize a neural network for image classification, built a convolutional neural network (CNN) for hand gesture recognition, optimized a CNN for facial recognition, and finally implement a neural style transfer CNN to create a work of art. The goal of this camp is to expose students to computation for STEM-related fields, with special emphasis on underrepresented students. These modules will be made available online for anyone to implement, and we are developing practitioner pieces to publish in *The Science Teacher*.

- **Mentor** — **2021**
  *Young Scholars Program* — *Tallahassee, Fl*

  I led a class session on environmental modeling using wave tank experiments and provided ten students with an extensive data set for them to analyze in their research project.

- **Volunteer** — **2019, 2020**
  *Math Fun Day* — *Tallahassee, Fl*

  I help run the computer-algebra room for children ages 4 and above by working through a set of programming challenges about polygons in the Scratch programming environment.

- **Judge** — **2019, 2020**
  *Capital Regional Science and Engineering Fair* — *Tallahassee, Fl*

## Teaching Experience

- **Fall 2021, Fall 2020** | **Instructor of Record:** *ISC3313: Introduction to Scientific Computing*

  In 2020, due to Covid-19, I implemented this course synchronously, online, via Zoom. In 2021, I implemented this course in person. It was my responsibility to develop lecture content, assignments, and a capstone project that complied with FSU's Computer competency course standards.
- **Fall 2019, Fall 2018** | **Graduate Teaching Assistant:** *ISC4232: Computational Methods for Continuous Problems*

  Developed and graded bi-weekly computer laboratory sessions for upper-level undergraduate students.
- **Spring 2019** | **Graduate Teaching Assistant:** *ISC5227: Survey of Numerical PDEs*

Provided assistance with completing course assignments.

- **Fall 2017 | Graduate Teaching Assistant:** *ISC5934: Introduction to Research Seminar*

  Developed course materials including lectures, in-class activities, and assignments.

### Workshop Participation

- **May 2019 | Workshop on Women In Numerical Methods for PDEs and their Applications:** *Banff International Research Station for Mathematical Innovation and Discovery*
- **July 2018 | Industrial Math/Stat Modeling (IMSM) Workshop for Graduate Students:** *The Statistical and Applied Mathematical Sciences Institute/Savvy Sherpa*

  Working alongside other graduate students and mentors from Savvy Sherpa, we identified an optimal precision treatment regime for patients diagnosed with rheumatoid arthritis by applying a reinforcement learning algorithm to a large insurance claims dataset.

## Publications

### Published

- Bryan Quaife, **Ashley Gannon**, Yuan-Nan Young. *Hydrodynamics of a Semipermeable Vesicle Under Flow and Confinement*. Physical Review Fluids, 6, 073601 (2021).

### Accepted

- **Ashley Gannon**, Mohsen Gahvi, Xin Yuan, David Whalley. *Student Reflections on Integrating Computer Science into Middle School Mathematics*. Innovation and Technology in Computer Science Education (ITiCSE)

### In Development

- **Ashley Gannon**, Bryan Quaife, Yuan-Nan Young. *Hydrodynamics of a multicomponent Vesicle Under Flow and Confinement*.

## Presentations

- **2022 APS March Meeting, Invited Session Speaker**, Chicago, IL
  Ashley Gannon, Bryan Quaife, Yuan-Nan Young, Shuwang Li *Hydrodynamics of a Multicomponent Vesicle Under Strong Confinement*

- **2021 APS Division of Fluid Dynamics, Contributed Talk**, Pheonix, AZ
  **Ashley Gannon**, Bryan Quaife, Yuan-Yan Young, Shuwang Li *Hydrodynamics of a Multicomponent Vesicle Under Strong Confinement*

- **2021 UTeach STEM Educators Virtual Conference, Contributed Talk**, Remote
  **Ashley Gannon**, Mohsen Gahvi, Xin Yuan, David Whalley *Computer Science Integrated with Mathematics in Middle Schools (CSIMMS)*

- **2021 STEM For All Video Showcase, Video Presentation**, Remote
  Jessica Smith, **Ashley Gannon**, Matthew Mauntel *Computer Science Integrated with Mathematics in Middle Schools (CSIMMS)*

- **2021 SIAM CSE, Minisymposium Presentation**, Remote
  **Ashley Gannon**, Bryan Quaife, Yuan-Nan Young *Integral Equation Methods for Semi-Permeable Vesicles*

- **2020 APS Division of Fluid Dynamics, Contributed Talk**, Remote
  **Ashley Gannon**, Bryan Quaife, Yuan-Nan Young *Semipermeable Vesicle in Stokes Flows*

- **2020 STEM For All Video Showcase, Video Presentation**, Remote
  **Ashley Gannon**, Matthew Mauntel, Jessica Smith *Computer Science Integrated with Mathematics in Middle Schools (CSIMMS)*

- **2019 SIAM Southeastern Atlantic Section, Poster Session**, Knoxville, TN
  **Ashley Gannon**, Bryan Quaife *Semi-Permeable Deformable Membranes in a Viscous Fluid*, 2019 SIAM Southeastern Atlantic Section program

- **2019 SIAM Conference on Computational Science and Engineering, Poster Session**, Spokane, WA
  **Ashley Gannon**, Bryan Quaife *Vesicle Adhesion in Constricted Geometries*, 2019 SIAM CSE conference program

- **2015 Society for Neuroscience Conference, Poster Session**
  Chicago, IL
  FangFang Fan, **Ashley Gannon**, Olivia N. Jackson, Thomas Spencer, Joseph Biederman, Pradeep G. Bhide, Jinmin Zhu, *Prenatal Nicotine Exposure Produces Attention Deficit In Male and Female Mice*, 2015 Neuroscience Meeting Planner

- **2015 Florida State University College of Medicine Undergraduate Research Fair, Poster Session**
  Tallahassee, FL
  **Ashley Gannon**, FangFang Fan, Pradeep G. Bhide, Jinmin Zhu, *Prenatal Nicotine Exposure Produces Attention Deficits In Mouse Model*

- **2014 Society for Neuroscience Conference, Poster Session**
  Washington, DC
  K.P. Lee, N. Pineda, T. Brune, K. Patel, **A. Gannon**, T.J. Spencer, J. Biedeman, P.G. Bhide, J. Zhu, *Hyperactivity and Working Memory Deficits Induced by Prenatal Nicotine Exposure are Associated With Dopamine D1 and D4 Receptor Dysfunction*, Program No. 36.16, 2014 Neuroscience Meeting Planner

## Technical Skills

- **Programming Languages:**
  - Python (*Expert*)
  - Matlab (*Expert*)
  - Fortran (*Proficient*)
  - C/C++ (*Proficient*)
  - R (*Familiar*)
  - SQL (*Familiar*)
- **Industry Software Skills:**
  - AutoCAD
- **Operating Systems:**
  - Windows
  - Linux

## General Employment

- **Department of Scientific Computing** **Tallahassee, Fl**
  *Technical Support Group* *Jan. 2018 – Aug. 2018*

  I worked on a team to monitor and maintain computer systems for the Department of Scientific Computing.

- **Florida State University Facility Engineering Services** **Tallahassee, Fl**
  *Utilities Engineering Intern* *Mar. 2016 – Aug. 2017*

  I aided in the design and upkeep of mechanical systems in Florida State University's district heating and cooling network and associated hydronic building equipment.

- **Liberty Park Elementary School** **Greenacres, Fl**
  *After School Counselor* *Aug. 2010 – May 2012*

  I aided in the implementation of a STEM program for after school students where I developed hands-on lesson plans to accompany weekly STEM topics, specifically for students aged 5-8 years old. Additionally, I helped students aged 5-10 complete their homework assignments, tutored students who were falling behind on math assignments, and created additional practice problem sets for students who finished their assignments early and wanted more of a challenge. I also developed long activities to do on extended days for the entire after school program including: a live Minute to Win It game show where students in grades K-5 were allowed to compete for prizes, field days, and water days.

## Current Organizations

### Professional

- **American Physical Society**
  *Member*
- **Society for Industrial and Applied Mathematics**
  *Member*
- **Google Women Techmakers**
  *Member*

### Student

- **Fellowship of Computational Scientists**
  *Education Outreach Coordinator*

## For References Contact:

- **Dr. Bryan Quaife** — **bquaife@fsu.edu**
  *Current Advisor*
- **Dr. Ellen Granger** — **granger@bio.fsu.edu**
  *Current Collaborator*
- **Dr. Jinmin Zhu** — **Jinmin.Zhu@fda.hhs.gov**
  *Former Advisor*
- **Mark Sawicki** — **msawicki@admin.fsu.edu**
  *Former Employer*