

Curriculum Vitae
Sasha M. Bakker

Projects Portfolio

WEBSITE: sashabakker.github.io

Personal Information

NAME: Sasha Marie Bakker
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Education

September 2017— **Degree:** Bachelor of Science in Physics
December 2020 **Where:** University of Massachusetts, Amherst, MA
Major GPA: 3.8 of 4.0
Minor in Mathematics

August 2013— **Degree:** Diploma
June 2017 **Where:** Mascoma Valley Regional High School, Canaan, NH

Research

January 2019— **Project:** Time Dependence of an Elastic Sheet at a Viscous Interface
September 2020 **Where:** University of Massachusetts, Amherst, MA
Advisor: Narayanan Menon

- I created thin sheet material, using vinyl polysiloxane, and designed an experimental apparatus.
- I videoed individual sheets rising in glycerol, with varying sheet dimensions, from the top and side views simultaneously.
- I collapsed the top view videos to 1D color intensity data, taking the derivative by convolution, and tracked the contact line and leading edge positions as inflection points in Python.
- I computed the speed of contact line recession and presented the results.

Employment

May 2019— **Position:** Printhead Test Lab Intern
August 2019 **Where:** Fujifilm Dimatix, Lebanon, NH

I executed various print and product tests, under the guidance of the applications development engineering team and lab technicians. This included studies on the minimization of cross-talk and the impact of an asymmetrical velocity distribution on prints. In one study, I

designed a passive baffle to reduce turbulence effects for high-standoff printing applications through qualitative comparison of 300+ prints. I also processed files using ImageMagick in AutoHotKey.

*May 2018—
August 2018*

I scripted a printhead test submission system in Google Apps Script through Google Sheets, shadowed engineers, concisely documented standard jetting performance testing procedures, and executed my own study on the spread of ink droplets prior to UV curing.

Teaching

*January 2019—
December 2020*

Position: Teaching Assistant

Where: Departments of Physics and Astronomy, UMass Amherst

I worked as an undergraduate teaching assistant in the course PHYS-281, Computational Physics in Python, for physics and astronomy majors. I held this position for four class sections over the course of three semesters, and was supervised by Prof. Donald Candela, Prof. Shubha Tewari, and Prof. Peter Schloerb. I assisted with programming classwork, graded assignments, and provided individualized feedback to students during class time and office hours.

*September 2018—
December 2018*

Position: Teaching Assistant

Where: Department of Physics, UMass Amherst

I worked as an undergraduate teaching assistant in the course PHYS-181, Mechanics, and was supervised by Prof. Jennifer Ross. I mentored nine freshman physics and astronomy students in solving Newtonian mechanics problems.

Technical experience

Hardware

Arduino Uno, Electronic circuits

Software

Python, R, SQL, C++, Google Apps Script, C, Java, AutoHotKey

Editing

LATEX, Adobe Photoshop, ImageJ

Computational Methods

Monte Carlo methods, Bootstrapping, Numerical optimization, Numerical Integration, Numerical solving of ODE's (2nd and 4th order Runge Kutta Method, Euler-Cromer method), Numerical solving of PDE's (Gauss-Seidel method, Relaxation method, Forward-time centered-space method), Quantum simulation (Shor's Algorithm, Grover's Algorithm), Discrete Fourier transform

Volunteering

Conference for Undergraduate Women in Physics Volunteer, UMass Amherst, 2019