

# Vanessa McHale

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## Education

### BA | MAY 2017 | UNIVERSITY OF WISCONSIN-MADISON

- Major: Mathematics

#### Graduate coursework

Math 721 – A First Course in Analysis  
Math 741 – Abstract Algebra  
Physics 711 – Dynamics  
Physics 721 – Electrodynamics  
Math 771 – Set Theory  
Math 770 – Foundations of Mathematics

#### Undergraduate Coursework

Math 531 – Probability Theory  
Math 567 – Elementary Number Theory  
Math 551 – Elementary Topology

### HIGH SCHOOL DIPLOMA | MAY 2013 | MONTGOMERY BLAIR HIGH SCHOOL

#### Coursework

Foundations of Computer Science  
Algorithms and Data Structures

## Experience

### INTERN | CARNEGIE INSTITUTION OF WASHINGTON – GEOPHYSICAL LABORATORY | JUNE-AUGUST 2012; MAY-AUGUST 2013

- I studied the electrocaloric effect using molecular dynamics, with the program DLPOLY.
- I wrote python scripts for data analysis, and made edits to FORTRAN code in order to simulate the cooling potential of material under strain.
- I wrote a paper and made a presentation in LaTeX at the end, providing theoretical evidence that solid-state refrigerators could be feasible at room temperature.

### STUDENT HOURLY | ERIKSSON LAB – UW PHYSICS DEPARTMENT | MAY 2014-AUGUST 2015

- I implemented Ethernet packet reception and data analysis on an FPGA, coding in VHDL.
- I designed and built a temperature and humidity monitoring system for the lab, which updated a web server that I set up using lighttpd. The system prevented equipment from overheating via email alerts.

### STUDENT HOURLY | CENTER FOR SLEEP AND CONSCIOUSNESS | JUNE 2015-AUGUST 2016

- I greatly improved an algorithm for the earth mover's distance with a specific metric; I also accelerated code by running it on a GPU
- The accelerated code ran comfortably on inputs 32 times the size of what was possible before, allowing researchers to study the information content or much more complex mechanisms.

## Skills

### HASKELL

- I am experienced with Haskell, having used it to accelerate code on a GPU and also to write language interpreters and parsers.

### VHDL

- I wrote VHDL code that received Ethernet packets on an FPGA; I also wrote a driver for an analog-to-digital converter.

### PYTHON

- I wrote scripts to perform data analysis and logging; I also have experience using python for scripting.

### BASH SHELL

- I can write bash scripts and use the command line.

### FRENCH & GERMAN

- I am fluent in French and proficient in German.