Jalen Cates
Physics & Math Student

linkedin.com/in/jalen-cates github.com/JCatesPH
+1 205 765 4445 jmcates@crimson.edu
800 Energy Center Blvd. Apt. 4502 Northport, AL 35473

Education

Present – Fall 2016 | **Honors Bachelor in Science, University of Alabama, Tuscaloosa, AL**
Major: *Physics & Mathematics*
Overall GPA: 3.75 Major GPA: 3.80

Professional Experience

Present – February 2019 | **Learning Assistant, University of Alabama Physics and Astronomy Department, Tuscaloosa, AL**
- Assist a professor and a graduate student with communicating introductory electricity and magnetism curriculum.
- Answer student questions during in-class exercises and laboratory experiences.
- Promote the study of physics by being an approachable, friendly assistant in a studio format.

Studio Physics | Introductory Physics Instruction | Socratic Questioning

May 2019 – July 2017 | **Residential Advisor, University of Alabama Housing & Residential Communities, Tuscaloosa, AL**
- Promote a sense of community in the Blount Living & Learning Community while maintaining the Community Living Standards.
- Plan and execute building programs in collaboration with other housing staff and campus partners.
- Be a campus representative to students and parents when performing building tours, assisting with move-in, and performing check-outs.

Teamwork | Event Planning | Private Information Management | Student and Parent Relations

Skills

Programming	**Python**, **C++**, **MATLAB**, Bash, C, LaTeX
Software	**VASP**, **ABINIT**, Quantum Espresso, Microsoft Office, R-Studio, Xmgrace, Spyder, Visual Studio, git, Jupyter Notebooks, GSAS, VESTA, ssh
Laboratory Skills	Solid-state synthesis techniques, X-ray crystallography, Magnetron sputtering
Operating Systems	Mac OS X, Windows 10, **Linux Ubuntu**, Linux Clusters

Programming Languages

Python	●●●●○
C++	●●●○○
Bash	●●●●○
MATLAB	●●●○○

Research Interests

- Thin-film Dynamics
- *Ab-initio* Calculations of Materials
- Materials Informatics
- 2D Materials and Heterostructures

Honors and Awards

October 2018	University of Alabama Housing & Residential Communities Big Al of the Month
Fall 2018	The University of Alabama Undergraduate Creativity and Research Academy Grant
Spring 2018	The University of Alabama SGA Research Grant
Fall 2017	The University of Alabama Undergraduate Creativity and Research Academy Grant
Fall 2016-Present	The University of Alabama Presidential Scholarship
Fall 2016-2017	The University of Alabama Dean's List
Fall 2018	The University of Alabama Dean's List

Projects

Ab-Initio Calculations of Heusler Alloys Jan. 2019 - Present

Hauser Lab Group

Supervised by Graduate Student, Sujan Budhathoki, and Assistant Professor, Adam Hauser. Project is focused on calculating the properties of X_2FeSi Heusler Alloys to investigate the thermodynamics of these materials for predictability of experimental thin-film growth. Significant progress has been made, but nothing has been written up so far.

VASP | Python | VESTA | DFT | Heusler Alloys

Superconducting Properties of Dysprosium-doped YBCO May 2017 - Sep. 2018

Hauser Lab Group

The project aimed to find any relationship between critical current density and/or critical temperature and Dysprosium content in the cuprate superconductor, YBCO. I trained other undergraduates in the synthesis process, refined the process to obtain higher grain purity, and wrote grant proposals for the project.

Planetary Ball Milling | X-Ray Powder Diffraction | XRD Rietveld Refinement | Furnace Annealing | Clean Room Procedures

Outreach and Volunteering

April 2019	Physics Tutor, University of Alabama Society of Physics Students' *AP Physics Review Night*
March 2019	Physics Presenter, University of Alabama Society of Physics Students' *High School Outreach*
Oct. 2018	College Volunteer, University of Alabama Association for Women in Science's *Elementary School Halloween Outreach*
Aug.-Nov. 2017	Student Volunteer, *Arts Renaissance in Tuscaloosa Schools*
June 2017	AP Calculus Student Mentor, *College First Program* with Impact Alabama

Professional

Fall 2018-present	Chapter Secretary, Society of Physics Students
2016-2017	Member, Emerging Scholars Program
2016-present	Member, American Physical Society
2016-present	Member, Society of Physics Students
2016-2019	Member, Blount Scholars Program

Conference Presentations

April 2019	**Presentation Finalist: Undergraduate Research, Scholarship, & Creative Activity Conference, UA College of Arts & Sciences** "Ab initio calculations of the structural, electronic, and magnetic properties of the Inverse Heusler Cr2FeSi"
March 2019	**Undergraduate Research & Creative Activity Conference, University of Alabama** "Ab initio calculations of the structural, electronic, and magnetic properties of the Inverse Heusler Cr2FeSi"
April 2018	**Undergraduate Research, Scholarship, & Creative Activity Conference, UA College of Arts & Sciences** "The superconducting properties of YBCO minutely-doped with Dysprosium"
March 2018	**Undergraduate Research & Creative Activity Conference, University of Alabama** "The superconducting properties of YBCO minutely-doped with Dysprosium"