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# Timothy Willard

I'm an undergraduate physics major who is passionate about applied science, scientific computing, and science communication with strong interpersonal, leadership, and team management skills with an interest in data science, scientific computing, computational physics, and materials physics.

## Education

May 2021 **North Carolina State University**, Raleigh, NC.  
BS Physics and planned BS Mathematics, GPA: 3.968/4.0

## Technical Skills

- **Programming Languages:** Python, Wolfram Mathematica. Familiar with R, MATLAB and learning Julia.
- **Tools:** Microsoft Office, L<sup>A</sup>T<sub>E</sub>X, Jupyter Lab, Numpy/Scipy, Matplotlib/Seaborn, Pandas, Sklearn, Skopt, Dash, Git, familiar with \*NIX environments.

## Work Experience

May **Undergraduate Researcher**, *Kemper Research Group*, Raleigh, NC.

2018–Present *Advisor: Alexander Kemper*

- Studied critical phenomena and phase transitions of electron-hole liquids in monolayer MoS<sub>2</sub>.
- Used open source scientific computing tools like numpy, scipy, and matplotlib to implement and visualize technical solutions.

Dec 2017–Mar **News Staff Writer**, *Technician*, Raleigh, NC.

- 2018
- Consistently wrote and researched one to two high quality news pieces for either print or web publishing each week.
  - Maintained professional relationships with previously developed sources and developed new sources from a variety of organizations.

Oct 2017–Dec **Assistant News Editor**, *Technician*, Raleigh, NC.

- 2017
- Assisted in managing a team of fifteen to twenty news staff writers and correspondents and planned story deadlines.
  - Planned content to meet two print and two web publishing quotas each week.
  - Connected news writers with necessary human and factual sources of information for their stories.
  - Managed, edited, and assisted in recording a once a week interview podcast, *Dialogue with Technician*.

August **News Correspondent**, *Technician*, Raleigh, NC.

- 2017–October
- 2017
- Consistently wrote and research one to two news pieces for either print or web publishing each week.
  - Reached out to and developed professional relationships with various human sources from a variety of organizations, including from NCSU departments and student organizations.

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## Presentations

- January 2019 **Critical Phenomena of Room-Temperature Electron-Hole Liquid in Photoexcited Quasi-Two-Dimensional MoS<sub>2</sub>**, *Future of Materials III-Workshop*, Raleigh, NC.  
*Awarded 3rd Place in the Poster Presentation Competition.*

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## Projects and Contributions

- August 2018–Present **Tim's Python Utilities**, *Author*.  
A collection of useful python utilities, including coordinate transformations, prefitted voting classifier for ensembling, and statistics utilities for random sampling.

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## Competitions

- August 2018–September 2018 **What's Cooking**, *Kaggle*.  
Ranked in the top 36% with an accuracy score of 0.81275 in a Kaggle data science competition to classify the cuisine of a recipe by its ingredients. I used NLP feature engineering techniques such as TF-IDF, N-grams, and stemming. I also used various models such as ridge classifier, logistic regression, stochastic gradient descent classifier, and support vector machines (with linear, polynomial, and RBF kernels).

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## Honors and Awards

- August 2017–December 2018 **Dean's List for Three Semesters**, *NCSU*, Raleigh, NC.
- September 2018 **Provost's Professional Experience Program**, *NCSU*, Raleigh, NC.  
*Research grant for the study of critical phenomena and phase transition of electron-hole liquids in monolayer MoS<sub>2</sub> under the advisement of Dr. Alexander F. Kemper.*
- August 2017 **NC State University Honors Program**, *NCSU*, Raleigh, NC.
- June 2017 **North Carolina Academic Scholar**, *Northwood High School*, Pittsboro, NC.
- September 2015 **National Honor Society**, *Northwood High School*, Pittsboro, NC.