MICHAEL RAY

I am a technical thinker with a unique mix of highly theoretical research experience, applied data modelling research experience, and expert level Python programming skills.

@ michael.ray436@gmail.com github.com/michaelray1 https://michaelray1.github.io/
in https://www.linkedin.com/in/michael-ray3/

EXPERIENCE

Research Assistant

Supervised by Dr. Rosalba Perna

May 2021 – Present Stony Brook University

- I analyze data and build data pipelines for high-performance astrophysical simulations in order to gain physical insights about astronomical structures.
- Tools used: Python (NumPy, Matplotlib), Fortran

Research Assistant

Supervised by Dr. Philip Argyres

March 2020 – Aug 2021 University of Cincinnati

- Contributed many creative ideas in quantum field theory which led to a recent publication
- Tools used: Pencil/paper calculations, Python, Mathematica

Research Assistant

Supervised by Dr. Colin Bischoff

Jan 2018 – March 2020 University of Cincinnati

- Developed and maintained an improved data pipeline for astronomical data. Pipeline lowered the variance of estimated signal from Monte-Carlo simulations, effectively shrinking the error bar on physical measurements.
- https://github.com/michaelray1/messenger_method.
- Tools used: Python (NumPy, HealPy, Matplotlib)

PERSONAL PROJECTS (ALL ON GITHUB)

Used Car Price Prediction

- Performed regression analysis on a data set of used car prices to predict future used car prices. Achieved consistent accuracy of price prediction within 25%.
- Tools used: Python (Pandas, Numpy, Matplotlib, TensorFlow, Scikit-learn).

Stock Market Predictor

- Built a package to predict stock price increases/decreases. Achieved 92% accuracy on S&P 500 stock predictions using neural network.
- Tools used: Python (TensorFlow, NumPy, Matplotlib, Robin-Hood API).

SKILLS

- **Programming**
  Python (5 years) - {Numpy, Pandas, Matplotlib, TensorFlow, Scikit-learn}; Linux/Command Line (4 years); C++(6 months); object-oriented programming; Monte-Carlo Simulations; Git/Github; Jupyter Notebooks

EDUCATION

M.A. Physics

Stony Brook University

Aug 2021 – Aug 2022

B.S. Physics; B.S. Mathematics (double major)

University of Cincinnati

Aug 2017 – May 2021

- 3.98/4.0 cumulative GPA

PUBLICATIONS

- P. C. Argyres, M. Martone, and M. Ray, Dirac pairings, one-form symmetries and Seiberg-Witten geometries, (2022), [https://arxiv.org/abs/2204.09682]

DOCUMENTED WORKS

- **Undergraduate Thesis in Mathematics**
  - https://michaelray1.github.io/assets/Math_Capstone_FD.pdf
- **Undergraduate Thesis in Physics**
  - Paper: https://michaelray1.github.io/assets/Senior_capstone_physics.pdf
  - Poster: https://michaelray1.github.io/assets/Capstone_poster_physics.pdf
- **CMB Data Analysis Poster**
  - https://journals.uc.edu/index.php/Undergradshowcase/article/view/4117/3124
- **CMB-S4 Internal Logbook Posting**
  - https://cmb-s4.uchicago.edu/wiki/index.php/PureB_by_Messenger_Method

AWARDS

- **Fellowships:**
  NDSEG Fellowship (2022, 4% acceptance rate, declined to pursue career in data science); SBU Fellowship (2021-22); Joiner Fellowship (2020)
- **Selected Scholarships (I won 16 total merit-based scholarships between 2017 and 2021):**
  Physics Alumni Endowed Scholarship (2019-20); UC Physics Scholarship (2018-21); Cincinnatus University Scholarship (2017-21)
- **Miscellaneous:**
  UC Sophomore Achievement Award in Physics; Dean's List; Member of Sigma Pi Sigma physics honor society; Member of Phi Beta Kappa academic honor society; Eagle Scout