

# Keyi Ding

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## Education

**Johns Hopkins University**, Baltimore, Maryland

2024

B.S., Physics and Computer Science

Minor in Applied Mathematics and Statistics, Mathematics

Cumulative GPA: 3.91/4

Activities: AstroJays Rocketry Club, Society of Physics Students

## Publications

- Schmidt, S. P., Schlafman, K. C., **Ding, K.**, et al. 2023, "Verification of Gaia DR3 Single-lined Spectroscopic Binary Solutions With Three Transiting Low-mass Secondaries", *AAS Journals*, submitted

## Manuscript in Preparation

- Ding, K.**, Schlafman, K. C., et al., "Accurate, Precise, and Self-consistent Photospheric and Fundamental Stellar Parameters for Solar-type Stars Without the Need for Spectroscopy", *in prep*

## Professional Appointments

### Undergraduate Research Assistant

2022 - Present

Department of Physics & Astronomy, Johns Hopkins University / Subaru Telescope Prime Focus Spectrograph (PFS) Galactic Archaeology Group  
Baltimore, MD.

*Advised by Prof. Rosemary F.G. Wyse, Carrie Filion*

- Establish a photometry-based machine learning pipeline to distinguish target M-giant stars in M31 from foreground Milky Way M-dwarf stars, for the target selection of the PFS M31 survey.
- Model the HSC narrow-band NB515 filter's sensitivity to stellar parameters and abundances with synthetic photometry of spectra in the MaNGA Stellar Library (MaStar).
- Use theoretical models to simulate observational data and physical properties of stars in M31 fields.
- Reduce covariate shift in machine learning by constructing training set that represents the stellar populations in both the foreground and M31.

### Undergraduate Astrophysics Researcher

2021 - Present

Department of Physics & Astronomy, Johns Hopkins University

Baltimore, MD.

*Advised by Prof. Kevin C. Schlafman, Dr. David Nataf, Dr. Henrique Reggiani*

- Develop a novel stellar parameters inference method by fitting multi-wavelength photometry, astrometry and dustmap to theoretical isochrones on a large scale (10k+ stars).
- Collect and clean photometric data from multiple astronomy databases with the ADQL query language.

- Test the precision and accuracy of the stellar parameters inference method with solar-type stars in open clusters.
- Program parallel computing tools to improve computation efficiency on advanced scientific computing servers.
- Employ the stellar parameters inference method to study candidate exoplanet host stars and transiting brown dwarfs.

**Instrument Support Intern**

2022 - 2023

Space Telescope Science Institute

Baltimore, MD.

*Advised by Dr. Louis-Gregory Strolger, Dr. Amy Jones, Sean Lockwood*

- Write [tutorial Jupyter Notebooks](#) for the Hubble Space Telescope Imaging Spectrograph (STIS) data user community.
- Implement Python scripts to answer help desk questions and for quick calculations.
- Standardize coding format of sample notebooks and edit documentation for publication.

**Honors and Awards**

Provost's Undergraduate Research Award (with a \$6000 research grant)	2023
IDIES Summer Student Research Fellowship (with a \$6000 research grant)	2022
HopHacks, Second Place	2022
Dean's List (GPA above 3.5/4 for 6/6 semesters)	2020 - 2023

**Conferences and Talks**

<b>Accurate and Precise Photospheric Stellar Parameters from Rubin ugriz Photometry</b>	August 2023
<i>Rubin Project and Community Workshop (PCW), LSST Cooperation, Tucson, AZ</i>	
<b>Updates on the STIS Jupyter Notebooks Repository</b>	April 2023
<i>The Telescope and Instruments Performance Summary (TIPS), Space Telescope Science Institute, Baltimore, MD</i>	
<b>STIS Jupyter Notebooks</b>	January 2023
<i>241st AAS Meeting, American Astronomical Society (AAS), Seattle, WA</i>	
<b>Laying the Foundation for Large Scale Stellar Parameter Inference in the Field of Exoplanets</b>	October 2022
<i>IDIES Annual Symposium, Institute for Data Intensive Engineering and Science (IDIES), Baltimore, MD</i>	
<b>Determining Stellar Parameters of Stars in Open Clusters using Isochrones Inference</b>	August 2022
<i>CARE Undergraduate Research Talks, JHU Center for Astrophysics Research Experience, Baltimore, MD</i>	

**Teaching Experience**

<b>AS.171.107 General Physics for Physical Science Majors (AL) I</b>	Fall 2023
Learning Assistant, with Prof. Rosemary Wyse	
<b>AS.171.108 General Physics for Physical Science Majors (AL) II</b>	Spring 2023
Learning Assistant, with Prof. Petar Maksimovic	
<b>AS.171.101 General Physics: Physical Science Major I</b>	Fall 2022
Learning Assistant, with Prof. Nadia Zakamska	

## References

**Rosemary F.G. Wyse**

Alumni Centennial Professor, Department of Physics and Astronomy, Johns Hopkins University

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**Kevin C. Schlafman**

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**Louis-Gregory Strolger**

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