Dylan Green

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University of California, Irvine | Department of Physics and Astronomy

Education

University of California, Irvine **Class of 2018**

B.S. in Physics with specialization in Astrophysics

Dean's Honor List Fall 2014-Spring 2018

Relevant Coursework: Multivariable calculus, linear algebra, observational astronomy (teaches IDL), quantum physics, electrodynamics, relativity, cosmology, and black holes.

University of California, Irvine **Expected 2025**

PhD in Physics; Advisor: Professor David Kirkby

Research Experience

Research Assistant (2017 - 2018) | Graduate Student Researcher (2018 - Present)

Professor David Kirkby

Junior member of the Dark Energy Science Collaboration (DESC) and the Dark Energy Spectroscopic Instrument (DESI)

- Developed a computer program that can transform an all-sky image taken with a fisheye lens into a right ascension and declination projection of the visible sky.
- Developed deep learning algorithms for cloud detection and identification in all-sky images.
- Designed a new tomographic binning algorithm from scratch that uses gradient descent in a clustering framework.
- Developed a deep learning algorithm for detection and identification of cosmic rays in spectroscopic data.
- Currently designing a deep learning algorithm that identifies quasars in DESI spectra.
- 5 days in person and 4 days remote observation experience on the Mayall 4m Telescope at Kitt Peak National Observatory.

Work Experience

Irvine PONY Youth Baseball **January 2008 - Present**

Seasonal Umpire

Orange County Baseball Officials Association **January 2020 - Present**

High School Umpire

Teaching Experience

Graduate Student TA **Fall 2019 - Winter 2020**

Courses taught:

- Physics 7LC - Classical Mechanics Lab (Fall 19 Instructor: Thorsten Ritz)
- Physics 7LC - Classical Mechanics Lab (Winter 20 Instructor: Jonathan Feng)

Volunteer Experience

Ingrid Green Performing Arts **January 2008 - Present**

Light and sound technician

- Volunteered at elementary and middle school productions
- Designed lightning cues for spotlights and overhead mounted full spectrum stage lights
- Operated twelve microphone systems on a variety of speaker/audio equipment

Contributions to Publications

[1] Dethe, T., Gill, H., Green, D., Greensweight, A., Gutierrez, L., He, M., Tajima, T., & Yang, K. (2019). **Causality and dispersion relations.** American Journal of Physics, 87(4), 279-290. doi:10.1119/1.5092679

- Discussion of causality and dispersion relations in a pedagogical context in a multitude of physical fields including quantum, optics, electromagnetism, solid state, and statistical mechanics.

[2] Zuntz, J., Lanusse, F., Malz, A. I., Wright, A. H., Slosar, A., Abolfathi, B., ... **Green, D.** ... & Mao, Y. Y. (2021). **The LSST-DESC 3x2pt Tomography Optimization Challenge.** Open J. Astrophys., 4, 13418. doi:10.21105/astro.2108.13418

- Designed and implemented an algorithm from scratch based on k-means clustering that can instead optimize for an arbitrary metric using gradient descent. For the challenge the algorithm was set to optimize for either cosmological signal-to-noise ratio or the figure of merit score.

Skills

- Proficient in Python. Proficiencies include the following packages:
    - Scientific packages: numpy, scipy, matplotlib, pyephem, and astropy.
    - Machine Learning packages: tensorflow, pytorch and jax.
- Can program in IDL and well versed in the Image Reduction and Analysis Facility (IRAF).
- Experienced in Java, Javascript, Nim, C#, HTML and LaTeX.
- Can read and write French at a good level.
- Proficient in Adobe Photoshop, Premiere and Audition, as well as Microsoft Word, Excel and PowerPoint.