W. D'Arcy Kenworthy

Quantitative Researcher

Professional Summary PhD-trained data scientist with expertise in statistical modeling, large-scale data analysis, and systematic uncertainty correction. Experience developing analytical frameworks adopted across international research collaborations. Seeking to leverage my expertise in statistical modeling towards market analysis and risk assessment.

Professional Experience

2022- Present, Postdoctoral Researcher
Oskar Klein Center, Stockholm University
Advisor: Ariel Goobar

- Worked on the Zwicky Transient Facility, release of largest-to-date sample of cosmological supernovae.
- Analyzed large datasets using statistical models to extract systematic patterns and correct for measurement biases
- Developed and validated predictive models for time-series data with sub-percent precision requirements
- Collaborated with international teams on data processing pipelines and uncertainty propagation methods

2017 - 2022, Graduate Research Assistant
Johns Hopkins University
Advisor: Adam Riess (Nobel Laureate)

- Worked on measurement of the Hubble constant and dark energy using Type Ia supernovae
- Developed SALT3 statistical modeling framework for analyzing observational time-series data
- Created methods for systematic bias identification and correction in large-scale measurement campaigns
- Implemented Bayesian statistical models for parameter estimation with highly correlated uncertainties

Education

2017 - 2022, Johns Hopkins University
PhD in Astronomy
Dissertation: Tightening the Distance Ladder
Awarded Rodger Doxsey Travel Prize by the American Astronomical Society

2017 - 2019, Johns Hopkins University
Masters of Art in Physics and Astronomy

2016 - 2017, University of Cambridge
Masters of Science: Part III Astrophysics

2013 - 2017, University of Cambridge
Baccalaureate of Arts: Part I Natural Sciences, Part II Physics

Contact Info

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Citizenship Status
Dual citizen of US and Ireland

Technical Skills

Programming
Python (data analysis, photometry), Stan (statistical modeling), JAX/Equinox (machine learning, high-speed computation)

Data Analysis
Large-scale dataset processing, statistical modeling, uncertainty quantification, systematic bias correction, model validation

Modeling
Time series analysis, Bayesian statistics, simulation-based inference

Tooling
Familiarity with AWS, Git, Mercurial

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Key Technical Contributions

Statistical Model Development
Lead developer for SALT3 framework for cosmological supernova time-series analysis, now adopted as standard tool across multiple international research collaborations

Bias Correction Methodology
Created systematic approaches for identifying and correcting measurement biases in observational datasets, published in peer-reviewed methodology

Multi-parameter Optimization
Developed Bayesian methods for parameter estimation in high-dimensional spaces with complex uncertainty correlations

Large-Scale Structure Analysis
Applied N-body simulations and power spectra to understand systematic effects in measurement campaigns

Leadership & Project Management

Co-Lead, DESC SN Ia Modeling Topical Team
Coordinate development and knowledge sharing between researchers across multiple institutions

Workshop Organization
Organized international workshop "DESC SN Ia Light-Curve Models of the Future" (Stockholm, Summer 2024), funded by DESC Operations Committee

Teaching & Mentoring
Teaching Assistant (2017-2019): Led observation sessions, provided individual instruction, managed grading and review sessions

Funding Success
Co-I on multiple funded proposals, including competitive HST and JWST proposals

Selected Publications

A Reassessment of the Pantheon+ and DES 5YR Calibration Uncertainties: Dovekie
Popovic, B. **Kenworthy, W. D.**, et al., 2025, arXiv:2506.05471, in review

ZTF SN Ia DR2: Improved SN Ia colors through expanded dimensionality with SALT3+
Kenworthy, W. D., Goobar, A. et al., 2025, A&A, 697, 125

Impact of Peculiar Velocities on Measurements of H_0
Kenworthy, W. D., Davis, T. M., 2024. Invited book chapter, Springer Series

Measurements of the Hubble Constant with a Two-rung Distance Ladder: Two Out of Three Ain't Bad
Kenworthy, W. D., Riess, A. et al., 2022, ApJ, 985, 83

SALT3: An Improved Type Ia Supernova Model for Measuring Cosmic Distances
Kenworthy, W. D., Jones, D. O., et al., 2021, ApJ, 923, 265