

# Jon Zink, Ph.D.

---

## Basic Information

(248)909-1107  
jonzink123@gmail.com

jonzink.com  
github.com/jonzink  
linkedin.com/in/jon-zink-phd

## Professional Experience

### California Institute of Technology

*NASA Hubble Postdoctoral Fellow*

**September, 2021 – Present**

- Led and coordinated team of 16 scientists, including junior researchers, to perform quality control tasks; deliver science products; and produce peer-reviewed publications.
- Extracted unprecedented exoplanet population trend with 99.99% confidence by accounting for sample biases/reliability: see NASA press release.
- Executed k-means clustering analysis to group planet classes, reducing the measurement uncertainty of existing methods by 22%.
- Implemented Bayesian hierarchical modeling to resolve a 30-year-old planetary formation mystery by identifying an intra-system correlation in giant planet systems.
- Developed Gaussian process regression methodology for robust time-series correlated-noise removal, improving planetary signal recovery by 9X and adopted by 12 independent research groups.
- Validated 60 planet signals through conditional survival analysis, concluding that each event had a false-positive likelihood of less than 0.1%.

### University of California, Los Angeles

*Graduate Researcher*

**September, 2016 – June, 2021**

- Developed Python algorithm able to search highly contaminated time-series data and identify planet signals with 94% reliability, resulting in the discovery of 372 planets: see Forbes & Newsweek press.
- Implemented random forest regression to characterize  $\sim 200,000$  stars, resulting in 93% accuracy of the validation set classification, a 48% improvement of existing methods.
- Derived Poisson point-process expansion, addressing bias issues associated with order statistics, improving the precision of inferred exoplanet population models by 36%.
- Produced novel likelihood function for forward model comparison, using the Anderson-Darling EDF and a modified Poisson PDF, enabling algorithm convergence 10X faster than existing methods.

## Software Development

- Produced open-source Python package able to parse exoplanet signals from statistical fluctuations in time-series data, used by 27 independent research groups: see EDLunplugged on Github.
- Developed forward modeling software in Python and R (ExoMult), enabling direct assessment, via sample biased Monte Carlo simulations, of complex intra-system correlations.
- Applied multi-core parallel structure to open-source code, resulting in a 12X speed boost for a memory intensive simulation.
- Contributed to open source Python software through bug fixes and feature additions: see KPF pipeline on GitHub.

## Skills

**Machine Learning:** Random Forest, SVM, PCA, Clustering; Supervised and Reinforcement Learning  
**Statistical Methods:** Bayesian, Time-Series, Error, and Survival Analysis; Hypothesis Testing, Monte Carlo Methods, Forward Modeling, EDF Testing, and Order Statistics  
**Software and Computing:** Open Source Contributor, Python, R, SQL, HTML, PyMC, TensorFlow, Scikit-learn, and Object-Oriented Coding

## Education

**University of California, Los Angeles**

- Ph.D., Astrophysics, 2021
- B.S., Astrophysics, 2014