



# Zachary Hafen-Saavedra

PhD, Astrophysical Data Analysis

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## Summary

Data scientist with ten years of experience earned as a Northwestern University and UC Irvine computational astrophysicist. Extensive history leading interdisciplinary collaborations and communicating complex concepts. Seeking positions in data science and data analysis, especially social-justice-focused positions.

## Skills

**Techniques:** data analysis (cleaning, sparse, big data, exploratory, time-series), machine learning, natural language processing, frequentist/Bayesian statistics, code testing, nested/multiscale modeling

**Interpersonal skills:** technical leadership and management, storytelling, mentoring

**Tools:** Python (numpy, pandas, matplotlib, scikit-learn), SQL, TensorFlow, Unix, C/C++, git, nltk,

## Experience

**Temporary Diversity, Equity, and Inclusion Data Analyst** June 2023 - Present  
Northwestern University, Center for Interdisc. Explor. and Research in Astrophysics Evanston, IL

- Analyzed cultural-climate survey data, [grouping race, gender, and professional role](#) to identify sociosystemic strengths and weaknesses
- [Automated data extraction](#) from unstructured PDF documents to increase analysis speed by  $>100\times$

**McCue Prize Postdoctoral Fellow in Cosmology** July 2020 - June 2023  
University of California–Irvine, Department of Physics and Astronomy Irvine, CA

- Employed [natural language processing](#) to convert  $>200,000$  scientific abstracts to quantitative data
- Trained an ensemble voting model to use abstract word content and paper metadata to [predict citation count](#) to within 3 citations per year for 75% of the validation set
- Performed complex [filtering of  \$>2\$  TB of remote data](#) via the NASA astrophysics data system API
- Spearheaded an international team spanning eight institutions to [validate Bayesian statistical models](#)

**National Science Foundation Graduate Fellow in K-12 Education** June 2014 - July 2020  
Northwestern University, Department of Physics and Astronomy Evanston, IL

- Introduced  [\$>100\$  students from underrepresented backgrounds](#) to data science by leading one of Chicago's first high-school data-science education initiatives
- Created [quantitative visualizations](#), educational [explanatory visualizations](#), and award-winning [artistic visualizations](#) to communicate core messages
- Processed [tens of TB of  \$>20\$ -dimensional data](#) using high-performance-computing resources, reducing to  $<100$  GB of highly-interpretable data
- Collaborated with a multidisciplinary range of scientists to publish (to date) [36 papers, 7 as a lead author](#)

## Education

**The Erdős Institute** 2023  
Data Science Certificate Irvine, CA

**Northwestern University** 2020  
PhD, MS, Physics and Astronomy Evanston, IL  
Specialization: Astrophysical Data Analysis

**University of Northern Colorado** 2014  
BS, Mathematical Physics Greeley, CO