

# ANDREW K. SAYDJARI

NASA Hubble Postdoctoral Fellow | Princeton

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## RESEARCH INTERESTS

I work at the interface of **data science** and **astrophysics**, developing new statistical tools to analyze large datasets. In terms of methods, I am intrigued by the low-SNR limit, **uncertainty quantification**, and blind signal separation. In terms of astrophysics, I strive to understand the spatial, kinematic, and chemical distribution of **interstellar dust**.

## POSITIONS

**NASA Hubble Fellow:** Princeton University, Department of Astrophysical Sciences 2024-2027

## EDUCATION

**Harvard University:** PhD in Physics 2018-2024

Advisor: Douglas Finkbeiner

Thesis: Statistical Models of the Spatial, Kinematic, and Chemical Complexity of Dust

**Yale University:** BSc/MSc in Chemistry, BSc in Mathematics 2014-2018

Thesis: Optimizing the Nickel-Catalyzed Carboxylation of Aryl Halides

## SELECTED AWARDS & HONORS

NASA Hubble Fellowship 2024-2027

Eric R. Keto Prize (Harvard), Best PhD thesis in theoretical astrophysics 2024

Best Astrostatistics Student Paper Award (ASA/AIG) 2022

Bok Center Certificate of Distinction in Teaching (Harvard) Fall 2021

NSF Graduate Research Fellowship (USA) 2018

Hertz Fellowship Finalist 2018, 2019

Howard Douglass Moore Prize (Yale), Chemistry's highest honor, awarded to a single graduating undergrad 2018

Barry Goldwater Scholar (USA) 2017

Phi Beta Kappa 2017

DAAD-RISE Fellowship (Yale/Germany), Research internship exchange 2016

## PUBLICATIONS

I am an author on **25+ papers** that have **821+** citations (h-index=12). This includes:

**10+ papers** as (co-)lead author with 266+ citations

**5+ papers** with **significant contributions** with 254+ citations

See my [Publication List](#) for details. My ORCID is [0000-0002-6561-9002](https://orcid.org/0000-0002-6561-9002).

Most of my papers can be found online on [ADS](#), though citations outside astronomy are missing.

## PROFESSIONAL ACTIVITIES & SERVICE

### Architect in SDSS-V

APOGEE pipeline development (Architect status conferred Aug 2024) Jan 2022 – present

### Harvard Astronomy Department

(1/2) Student Representatives to Faculty Search Committee (Elected) Jan - Mar 2023

Organizer for Student Faculty Forum (StuFF) 2022 - 2023

### Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)

Computing Committee June 2022-present

### American Astronomical Society

Chambliss Poster Judge (AAS 240, AAS 241, AAS 245) June 2022-present

## Manuscript Referee

American Astronomical Society Journals (ApJ)	2023-present
Journal of Open Source Software (JOSS)	2024-present
Astronomy & Astrophysics (A&A)	2025-present

## SUPERVISION & MENTORSHIP

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I have (co-)supervised/mentored **5 students**:

### Graduate

- |   |                   |
|---|-------------------|
| 1. Ana Sofia Uzsoy (Astronomy, Harvard)                                   | Fall 2022-Present |
| Component Separation of Lyman Alpha Emitters in DESI (w/ Doug Finkbeiner) |                   |

### Undergraduate

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|--|---------------------|
| 4. Zack Steine (CS & Statistics, University of Toronto)  | Summer 2024-Present |
| SBI for DESI Stellar Parameters (w/ Josh Speagle)  |                     |
| 3. Devisree Tallapaneni (Physics & Statistics, Cornell → OSU Grad)                                       | Summer 2023-Present |
| Quantifying the Filamentary ISM: Statistical Reconstructions of Reality (w/ Eric Koch & Doug Finkbeiner) |                     |
| 2. Stephanie Yoshida (Astronomy, Harvard → Milwaukee Brewers)  | Fall 2023           |
| Kinetic Tomography of the Intermediate Velocity Arch (w/ Catherine Zucker & Doug Finkbeiner)             |                     |
| 1. Ken Michalek (Computer Science, Harvard Extension School → MIT Lincoln Lab)                           | 2020-2021           |
| Online Blind Deconvolution for Educational Astronomy (w/ Dominic Pesce & Allyson Bieryla)                |                     |

## TEACHING

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I care passionately about teaching and love ideating new ways of explaining difficult concepts. I emphasize the development of hands-on teaching methods, incorporating active learning through experiment and data-based exploration. I view creating an inclusive atmosphere, in which all students can comfortably learn, as a top priority.

Harvard University, Teaching Fellow	Fall 2021
Solid State Physics, Lecture, Undergrad/Grad, 27 students, w/Prof. Julia Mundy	
Feedback: <a href="#">Student Evaluations</a>	

Yale University, Peer Tutor	2015-2018
Physical Chemistry, Lab, Undergrad, 30 students, w/Prof. Patrick Vaccaro	
Physical Chemistry II, Lecture, Undergrad, 30 students, w/Prof. Patrick Vaccaro	
Freshman Organic Chemistry II, Lecture, Undergrad, 100 students, w/Prof. Alanna Schepartz	
Sophomore Organic Chemistry I, Lecture, Undergrad, 120 students, w/Prof. Jonathan Ellman	

SPLASH/SPROUT @ Yale, Middle School	2015-2018
Peeling Back the Layers of Solar Cells (30 students), Metal Mania: Simple Models of the Material World (4 students), Destressing Tensors (7 students), Abstract Algebra: Questions Teachers Didn't Answer (60, 75 students), Origins of Life: A Chemist's Perspective (16, 35 students)	

## SELECTED PRESENTATIONS

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I have given **42+ public science talks**. See my [Talk List](#) for more details. Recent highlights include:

### Invited Colloquia

NMSU Colloquium	January 2025
Mapping Milky Way Dust in n-Dimensions	
NYU CCPP Seminar	November 2024
The Spatial, Kinematic, and Chemical Complexity of Dust	

### Invited Conference Talks

Roman GPS Community Workshop	February 2025
Optimizing the Galactic Plane Survey Filter Selection	
NASA NHFP Symposium 2024	September 2024
The Highest Angular Resolution 3D Dust Map	

Galactic Science with the Nancy Grace Roman Space Telescope	June 2024
The DECam Plane Survey as a Roman Galactic Plane Survey Pathfinder	
JSM 2022: Astrostatistics Interest Group: Student Paper Award	August 2022
Photometry on Structured Backgrounds: Local Pixelwise Infilling by Regression	

### Contributed Conference Talks

Sloan Digital Sky Survey V (SDSS-V) Collaboration Meeting	June 2024
Diffuse Interstellar Bands in APOGEE: Unlocking Precision Dust Kinematics	
Statistical Challenges in Machine Learning and Astrophysics (SCMA) VIII	June 2023
Measuring the 8621 Å Diffuse Interstellar Band in Gaia DR3 RVS Spectra:	
Obtaining a Clean Catalog by Marginalizing over Stellar Types	
RAS Specialist Discussion: 1D ML	March 2023
Measuring the 8621 Å Diffuse Interstellar Band in Gaia DR3 RVS Spectra	
DECAM at 10 Years Workshop	September 2022
The DECam Plane Survey 2 (DECaPS2): More Sky, Less Bias, and Better Uncertainties	

### Seminars, Lunch Talks, & Journal Clubs

CFA: Institute for Theory and Computation (ITC), Keto Award Seminar	May 2024
The Spatial, Kinematic, and Chemical Complexity of Dust	
UWSeattle: Astro Lunch	April 2023
Probabilistic Component Separation: Deconstructing Photometric and Spectroscopic Pipelines	
IAS: Pan-Experiment Galactic Science Group	July 2021
Learning from ISM Texture using the Wavelet Scattering Transform	
LPENS: AstroLunch	December 2020
Scattering Transform Methods: Applications to Galactic Dust	

## OUTREACH & ENGAGEMENT

### Public Science Writing

MathStatsBites: <a href="#">TheSequencer</a> , <a href="#">CycleStarNet</a> , <a href="#">SCMA8</a> , <a href="#">NestedSampling</a>	2022-2023
LightSound Workshop, Soldering Solar Eclipse Sonification Instruments	Summer 2023
Cambridge Science Festival, MIT Museum Presentation Volunteer	Fall 2022
Latino Initiative Program, Instructor	Summer 2021- Summer 2023
Harvard Observation Project, Software Mentor	2020-2021

## PRESS

DECaPS2 Release: <a href="#">WSJ</a> , <a href="#">Wired</a> , <a href="#">AP</a> , <a href="#">CNN</a> , <a href="#">Register</a> , <a href="#">Salon</a> , <a href="#">Forbes</a> , <a href="#">Space.com</a> , <a href="#">AAS Nova</a>	January 2023
Grad Student Highlight: <a href="#">Labroots</a>	November 2022
Machine Learning & Interstellar Dust Clouds: <a href="#">Abstract: The Future of Science</a>	December 2020

## SELECTED RESEARCH SKILLS

### Computational

I am a strong advocate of both open-source code and data, and I insist on public reproducibility of all plots in my work (see [my Zenodo](#) deposits accompanying my papers).

Developer: Julia (4 years, primary), Python (7 years), MATLAB (3 years) [[Github](#)]

Developed pipelines and managed >100k core-h runs in both Julia and Python

Managed daily simultaneous multi-instrument measurements in MATLAB

Public Packages: [LowRankOps.jl](#), [KryburyCompress.jl](#), [CloudCovErr.jl](#), [CloudClean.jl](#), [EqWS.jl](#), [crowdsourcing](#)

### Laboratory

Fabrication: EBL, RIE, ALD, Photolithography, Thermal/E-beam/Sputtering Deposition

Characterization: (S)TEM/EDX, FIB, SEM, AFM

Spectroscopy: Terahertz-Time Domain, SPR, XPS, NMR (1H, 13C, 31P, NOSEY), EPR