

# 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

International Astronomical Union (IAU) Thesis Prize: Division H (Galactic/ISM), Best PhD thesis 2025

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 **38+ papers** that have **1197+** citations (h-index=14). This includes:

**11+ papers** as (co-)lead author with 354+ citations

**6+ papers** with **significant contributions** with 286+ 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

### Collaborations, Committees, & Leadership:

Architect for SDSS-V, APOGEE pipeline development Jan 2022 - present

Leadership Council, AI/ML Science Interest Group (NASA Cosmic Origin Program) Fall 2025 - present

Computing Committee, Institute for Artificial Intelligence and Fundamental Interactions (IAIFI) 2022 - 2024

Faculty Search Committee, (1/2 elected) Student Representatives (Harvard Astronomy) Jan - Mar 2023

### Review:

External System Readiness Review (ESRR) Panel for the Fornax Initiative (NASA Cloud Compute) Fall 2025

NSF Astronomy & Astrophysics Research Grant (AAG) Panel Spring 2025

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

Journal Referee for ApJ, AJ, A&A, and Journal of Open Source Software (JOSS) 2023 - present

### Conference and Seminar Organization:

Student Faculty Forum (StuFF) Co-organizer, Harvard Astronomy 2022 - 2023

## SUPERVISION & MENTORSHIP

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I have (co-)supervised/mentored **8 students**:

### Graduate:

4. Christian Kragh Jespersen (Astrophysics, Princeton) Spring 2025 - Present  
Constraining DIB carrier geometries via rotational spectra forward modeling
3. Rhys Seeburger (Astronomy, MPIA → LJMU Postdoc) Spring 2025  
Analyzing SB2s in APOGEE x Gaia (w/ Hans-Walter Rix)
2. Theo O'Neill (Astronomy, Harvard) Fall 2024 - Present  
3D High Altitude Clouds (IVCs) and DESI Na Tomography (w/ Catherine Zucker)
1. Ana Sofia Uzsoy (Astronomy, Harvard) Fall 2022 - Summer 2025  
Component Separation of Lyman Alpha Emitters in DESI (w/ Doug Finkbeiner)

### Undergraduate:

4. Zack Steine (CS & Statistics, University of Toronto Scarborough → Veeva Systems) Summer 2024 - Winter 2024  
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)
2. Stephanie Yoshida (Astronomy, Harvard → Milwaukee Brewers) Fall 2023  
Kinetic Tomography of the Intermediate Velocity Arch (w/ Catherine Zucker)
1. Ken Michalek (Computer Science, Harvard Extension School → MIT Lincoln Lab) 2020 - 2021  
Online Blind Deconvolution for Educational Astronomy (w/ Dominic Pesce & Allyson Bieryla)

### Programs:

Polaris: Mentoring Harvard Physics Undergraduates (3 students) 2021 - 2024

## 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: [Student Evaluations](#)

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 **53+ talks (12+ invited talks/colloquia)**. See my [Talk List](#) for more details. Recent highlights include:

### Invited Colloquia

UW-Madison Colloquium March 2025

Mapping Milky Way Dust in n-Dimensions

NYU CCPP Seminar	November 2024
The Spatial, Kinematic, and Chemical Complexity of Dust	
<b>Invited Talks</b>	
AAS 247: PRIMA Special Session	January 2026
PRIM(All): An All-Sky, Polarized, FIR Dust Map and Point-Source Catalog	
Princeton Astrophysical Sciences Advisory Council Meeting	May 2025
Galactic Cartography: Dust in 3D and Beyond	
Roman GPS Community Workshop	February 2025
Optimizing the Galactic Plane Survey Filter Selection	
Galactic Science with the Nancy Grace Roman Space Telescope	June 2024
The DECam Plane Survey as a Roman Galactic Plane Survey Pathfinder	
<b>Contributed Conference Talks</b>	
Dusty Universe: The 5th Pan-Dust Conference	June 2024
Correlations between Extinction Features across Wavelength Scales:	
Realizing Diffuse Interstellar Bands as Chemical Tracers	
JuliaCon Global	July 2025
Building an End-to-End Spectral Reduction Pipeline for APOGEE	
Interstellar Institute #7: Interstellar Physics Across Scales	July 2025
Reconstructing the 3D+1V Velocity Field of the Milky Way from Dust Absorption	
Sloan Digital Sky Survey V (SDSS-V) Collaboration Meeting	June 2025
Mapping ISM Chemistry and Kinematics with APOGEE DIBs	
ApogeeReduction.jl: An APOGEE Reduction Pipeline for the AS5 Era	
PRIMA and the Future of Far-Infrared Science	May 2025
The Case for A PRIMA All-Sky Polarized Dust Map (and Point Source Catalog)	
New Computational Methods in Milky Way Dynamics and Structure @ Ringberg	July 2024
Bayesian Component Separation for Ground Based Spectra: Transforming Diffuse	
Interstellar Bands into Precision Kinematic Tracers	
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	
<b>Seminars, Lunch Talks, &amp; Journal Clubs</b>	
Columbia: Pizza Chalk Talk	February 2025
The Spatial, Kinematic, and Chemical Complexity of Dust	
IAS: Bahcall Lunch	November 2024
The Highest Angular Resolution 3D Dust Map	
<b>OUTREACH &amp; ENGAGEMENT</b>	
<b>Public Science Writing</b>	
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
<b>GRANT SUPPORT &amp; TELESCOPE TIME</b>	
5. Certum: Multiband Webb Images in the Inner Galaxy for the Roman Galactic Plane Survey	2025 - 2026
Co-Investigator (PI: Schlafly)	STScI (JWST Cycle 4 Director's Discretionary Time)
4. Topological Mapping of Super bubbles and ISM Structures with JWST	2025 - 2027
Co-Investigator (PI: O'Neill), \$105,000	STScI (JWST Cycle 4 Archival)

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| 3. A Flexible Open-Source Framework for Rapid Stellar Classification in the Era of Roman | 2025 - 2027          |
| Co-Investigator (PI: Zucker), \$388,000  | NASA (ROMAN24-ROSES) |
| 2. A Next-Generation Crowded-Field Stellar Photometry Tool for Roman                     | 2025 - 2027          |
| Collaborator (PI: Smercina), \$981,000   | NASA (ROMAN24-ROSES) |
| 1. Inferring Kinematic and Chemical Maps of Galactic Dust                                | 2024 - 2027          |
| PI: Saydjari, \$471,000  | STScI (NHFP Hubble)  |

## PRESS

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IAU Thesis Prize: <a href="#">CFA</a> , <a href="#">Princeton</a> , <a href="#">IAU</a>	June 2025
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

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### 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 (5 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](#)