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 **40+ papers** that have **1261+** citations (h-index=16). This includes:

   12+ papers as **(co-)lead author** with 369+ citations

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

See my Publication List for details. My ORCID is 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

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 Sofía 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

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

I have given **53+ talks (14+ invited talks/colloquia)**. See my [Talk List](#) for more details. Recent highlights include:

Invited Colloquia
NMSU Colloquium   November 2025
    Spectral Shadows of Structure at Scale: Chemokinematic Cartography of the Milky Way

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	

Invited Talks

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	

Contributed Conference Talks

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	

Seminars, Lunch Talks, & Journal Clubs

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	

OUTREACH & ENGAGEMENT

Public Science Writing

MathStatsBites: TheSequencer, CycleStarNet, SCMA8, NestedSampling	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

GRANT SUPPORT & TELESCOPE TIME

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)
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

IAU Thesis Prize: [CFA](), [Princeton](), [IAU]()   June 2025
DECaPS2 Release: [WSJ](), [Wired](), [AP](), [CNN](), [Register](), [Salon](), [Forbes](), [Space.com](), [AAS Nova]()   January 2023
Grad Student Highlight: [Labroots]()   November 2022
Machine Learning & Interstellar Dust Clouds: [Abstract: The Future of Science]()   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 (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](), [crowdsource]()