Zachary Stone

1002 W. Green St, Urbana, IL 61801 • stone28@illinois.edu • ORCiD • GitHub • Publications

4 first-author publications • 13 total publications • h-index 7 • 2 published softwares

Education

Stony Brook University **08/2017 - 05/2021**

B.S. in Astronomy Magna Cum Laude
B.S. in Physics
Minor in Mathematics Advisor: Kenneth Lanzetta

University of Illinois at Urbana-Champaign **08/2021 - 08/2026**

M.A. in Astronomy
Ph.D. in Astronomy Advisor: Yue Shen

Professional Experience

Programming: Python, Fortran, C/C++, Mathematica, Slurm, MPI, SQL, TAP

Scientific Software: NumPy, SciPy, Astropy, Matplotlib, Numba, CuPy, emcee, tinygp, dynesty, AstrOmatic suite

Software Development: GitHub, GitHub Actions, Pytest, Codecov, pip/Anaconda, Docker, Read the Docs, Sphinx

Computing Resources: NCSA HAL, NCSA DELTA

Facilities/Observatories: DECam/DES, JWST (NIRCam/NIRSpec), Euclid, SDSS (LCO/APO), TESS

Academic Journal Referee: Journal of Open Software Science (JOSS), ApJ, MNRAS

Accepted Observing / Computing Time

Blanco 4m DECam at CTIO

Co-I of program (24A-25B) 6 nights
Monitoring of the SDSS-RM Fields

DELTA at NCSA, UIUC

PI of NSF ACCESS Explorer program (25B-26B) 200 GPU-hr, 50k CPU-hr
Extracting Variability with Difference Imaging for the NEXUS JWST Survey

Awards / Fellowships

Center for AstroPhysical Surveys (CAPS) Graduate Fellow **2022-2023**
National Center for Supercomputing Applications, UIUC ($30,000)

NOIRLab Travel Grant **2023**
NOIRLab ($3,000)

SDSS-V Early Career Travel Grant **2024**
SDSS-V Collaboration ($1,000)

UIUC Graduate College Conference Presentation Award **2025**
UIUC Graduate College ($500)

Lew Snyder Travel Award **2025**
UIUC Department of Astronomy ($500)

Affiliations / Memberships

UIUC Department of Astronomy | NEXUS - JWST Survey | Dark Energy Survey (DES) | SDSS-V Collaboration
LSST AGN Science Collaboration | National Center for Supercomputing Applications (NCSA)

Software

Published

Stone, Z. 2025, Zenodo, 10.5281/zenodo.17459592, *TempMap: A package following Stone & Shen (2023) for AGN accretion disk temperature fluctuation maps* (GitHub)

Stone, Z. 2024, Astrophysics Source Code Library, ascl:2401.004, *pyPETaL: A Pipeline for Estimating AGN Time Lags* (GitHub)

Other Relevant Software

Stone, Z., 2025, *NEXUS-VP: The NEXUS Nuclear Variability Pipeline* (GitHub)

Stone, Z., 2024, *DM Utils: Utilities for extracting emission line data from AGN spectra and dynamical modeling with BRAINS* (GitHub)

Hu, L., et al. (incl. **Z. Stone**), 2022, *SFFT: Saccadic Fast Fourier Transform for image subtraction* (GitHub)

Selected Publications

Principal-Author

Burke C. J., **Stone, Z.**, et al. 2025, **ApJ**, accepted, *Too Quiet for Comfort: Local Little Red Dots Lack Variability over Decades* (arXiv:2511.16082)

Stone, Z., et al. 2025, **ApJ**, submitted, *NEXUS: A Search for Nuclear Variability with the First Two JWST NIRCam Epochs* (arXiv:2509.19585)

Stone, Z., et al. 2025, **ApJ**, 991, 218, *The SDSS-V Black Hole Mapper Reverberation Mapping Project: Multi-Line Dynamical Modeling of a Highly Variable Active Galactic Nucleus with Decade-long Light Curves*

Shen, Y., Grier, C. J., Horne, K., **Stone, Z.**, et al. 2024, **ApJS**, 272, 26, *The Sloan Digital Sky Survey Reverberation Mapping Project: Key Results*

Stone, Z. & Shen, Y. 2023, **MNRAS**, 524, 4521, *Temperature Fluctuations in Quasar Accretion Discs from Spectroscopic Monitoring Data*

Stone, Z., et al. 2022, **MNRAS**, 514, 164, *Optical Variability of Quasars with 20-Yr Photometric Light Curves*

Contributing-Author

Vizgan, D., et al. (incl. **Z. Stone**) 2026, **ApJ**, accepted, *JWST's PEARLS: A clumpy ring galaxy at* $z = 4.0148$ (arXiv:2603.11575)

Zhao, X., et al. (incl. **Z. Stone**) 2026, **ApJ**, 1000, 28, *Transient Relativistic Iron Emission Line from a Flaring Supermassive Black Hole*

Fries, L. B., et al. (incl. **Z. Stone**) 2024, **ApJ**, 975, 239, *The SDSS-V Black Hole Mapper Reverberation Mapping Project: A Kinematically Variable Broad-line Region and Consequences for the Masses of Luminous Quasars*

Zhuang, M.-Y., et al. (incl. **Z. Stone**) 2024, **ApJS**, 274, 42, *High-Quality Extragalactic Legacy-field Monitoring (HELM) with DECam: Project Overview and First Data Release*

Forthcoming

Stone, Z. et al. 2026, *NEXUS: Broad-line Variability in Little Red Dots and Blue Active Galactic Nuclei at* $2 \lesssim x \lesssim 6$
Status: Submitting to ApJ mid-2026

Stone Z., et al. 2026, *The SDSS-V Black Hole Mapper Reverberation Mapping Project: Short Lags in the COSMOS Field within the First Year*
Status: Submitting to ApJ mid-2026

Stone, Z., et al. 2026, *HELM: Second Data Release with DES Light Curves*
Status: Submitting to ApJ mid-2026

Talks & Presentations

Invited

OzDES RM Meeting **10/17/2023**
(Remote only)
Revealing the Inner Workings of AGN with Survey-Based Reverberation Mapping

2023 DES Fall Collaboration Meeting **10/10/2023**
(Remote) NCSA, UIUC
Quasar Meteorlogy: Resolving the Broad-Line Region with Reverberation Mapping

NOIRLab South Colloquium Series **09/13/2023**
AURA Recinto, La Serena, Chile
Revealing the Inner Workings of AGN with Survey-Based Reverberation Mapping

DES Portsmouth Collaboration Meeting **01/16/2023**
(Remote) ICG, University of Portsmouth
Analyzing 20 Years of Quasar Variability

Contributed

AAS 247 **01/2026**
Phoenix, AZ
Probing Small-Scale AGN Dynamics with Reverberation Mapping using SDSS-V and JWST

Princeton Thursday Lunch (Thunch) Talk **12/2025**
Princeton University, Princeton, NJ
Probing the Oldest Black Holes with Detailed Modeling of AGN Variability

MIT Monday Afternoon Talks **12/2025**
MIT Kavli Institute for Astrophysics and Space Research, Cambridge, MA
Probing the Oldest Black Holes with Detailed Modeling of AGN Variability

2025 SDSS-V Collaboration Meeting **06/2025**
MPIA, Heidelberg, Germany
Peering into the Inner Parsec of a Highly-Variable AGN

UIUC Journal Club **09/2024**
UIUC
Modeling the Broad-Line Region in a Highly Variable AGN

2024 SDSS-V Collaboration Meeting **06/2024**
New Mexico State University, Las Cruces, New Mexico
Dynamical Modeling of a Highly Variable Quasar

The Restless Nature of AGN: 10 Years Later **06/2023**
University of Naples Federico II, Naples, Italy
Uncovering Optical Quasar Variability After 20 Years

UIUC Journal Club **02/2022**
UIUC
A New Look at Quasar Variability with 20 Years of Light Curves

DES All-Collaboration Conference **12/2021**
(Remote only)
Optical variability of quasars with 20-yr photometric light curves