Joshua V. Shields

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Education

PhD in Astrophysics — Michigan State University, East Lansing, MI   2019-2024
Thesis - Run With the Hunted: Searching For Surviving SN Ia Companions and Constraining the SN Ia Progenitor System Through Stellar Modelling - Advisor: Dr Wolfgang Kerzendorf
Conducting systematic supernova remnant stellar populations to identify surviving companions of the exploded stars. Work involves astrometry and proper motion extraction, analysis of large astronomical surveys, physical modeling of stellar observations and radiative transfer simulations of stellar atmospheres

Postbaccalaureate Research - ASAS-SN Analyst — The Ohio State University, Columbus, OH   2017-2019
Additional Graduate Level Classes - Astronomy
Advisors - Krzysztof Stanek and Christopher Kochanek
Maintenance of the ASAS-SN Survey to discover low redshift transients

Bachelors of Arts — Vassar College, Poughkeepsie, NY   2012-2016
Triple Major - Physics, Astronomy, and Russian Studies
Advisor - Debra Elmegreen

Professional Talks

Rise Time - Purdue University - Contributed Talk   Aug 2024

Space Telescope Science Institute Transients Group - Invited Talk   Oct 2023

University of Michigan - Extreme Astrophysics Group Invited Talk   Apr 2023

54th Annual Meeting of the Dynamical Division of Astronomy - Contributed Talk   May 2023

Michigan State Astrophysics Seminar   Oct 2022

2nd Meeting on Progress in Astrophysics with Type-Ia Supernovae - Royal Astronomical Society
Contributed Talk   Dec 2022

Supernova Remnants and their Progenitors - Center for Astrophysics, Harvard and Smithsonian
Contributed Talk   Aug 2022

Academic Leadership and Service

Michigan State Journal Club - Astro Coffee — Founder   2020-Present

Stellar Mentorship Program — Graduate Student Mentor   2021-2022

Software Development

STARDIS - Lead Developer — Stellar spectral synthesis

TARDIS - Core Developer — Monte Carlo radiative transfer in supernovae

CARSUS - Developer— Atomic Database for Astronomy

Mentoring and Teaching

Undergraduate Research Assistant - Ryan Groneck - Designing Approachable Documentation and Introductory Material for Stellar Spectral Synthesis 2024-Present

Summer REU - Kiyah Young-Wilson - Measuring Chemical Abundances of Galactic Center Stars 2024

Summer REU - Iliomar Rodriguez-Ramos - Exploring the Complex Structures of Ancient Stars 2023

Google Summer of Code - William Black - Methods In Stellar Modeling and Code Structure 2023

Google Summer of Code - Aarya Chaumal - Stellar Atmospheric Code Optimization 2023

Undergraduate Research Assistant - Sofia Biriouk - Cass A Stellar Population Investigation 2021 - 2023

Undergraduate Research Assistant - Hayden Monk - Ia Remnant Population Visualization 2022 - 2024

Summer REU - Morgan Sandler - Repository Construction For All ADS Publications 2020

Graduate Teaching Assistant - Introductory Astronomy Lab Class 2019-2021

Outreach

Astronomy On Tap Public Outreach Event - Ongoing — Speaker 2022 - 2024

MSU Observatory Public Observing Night - Ongoing — Volunteer 2023 - 2024

Open Public Observing Nights - Vassar Class of 1951 Observatory — Volunteer 2015 - 2016

Reviewer Activities

Refereed 2 articles for the Astrophysical Journal

Non-refereed Publications, Circulars, Telegrams

Co-authored 330+ Astronomer's Telegrams and Transient Name Server reports
(12 First Author)

Computational Skills

Operating Systems - MacOS/OS X, UNIX/Linux, Windows
Computer Languages - Python, LaTeX, bash, SQL, R, html, Perl, Mathematica, Java
Software - git, emacs, VScode, topcat, DS9, IRAF, MESA

Awards

Outstanding Scholar Fellowship - Michigan State University 2024

Dissertation Completion Fellowship - Michigan State University 2023

Outstanding Teaching Assistant Award 2020

Research Interests

Supernova and stellar radiative transfer and spectral synthesis, supernova remnants, archival data synthesis, astrostatistics, Bayesian inference and Monte Carlo methods, supernova cosmology

Publications

Published(19 total, 3 first author, 1988 total citations, h-index of 14 as of Oct 2024)

1. *No Surviving SN Ia Companion In SNR 0509-67.5: Stellar Population Characterization and Comparison To Models*
   Shields, J. V. et al. 2023, *ApJL*, 950, L10

2. *The ASAS-SN bright Supernova catalog – V. 2018-2020*
   Neumann, K. D. et al. 2023, *MNRAS*, tmp, 366N

3. *Searching for a Hypervelocity White Dwarf SN Ia Companion: A Proper-motion Survey of SN 1006*
   Shields, J. V. et al. 2022, *ApJL*, 933, L31

4. *Survey of period variations of superhumps in SU UMa-type dwarf novae. X. The tenth year (2017)*
   Kato, Taichi et al. 2020, *PASJ*, 72, 14K

5. *The ASAS-SN catalogue of variable stars - V. Variables in the Southern hemisphere*
   Jayasinghe, T. et al. 2020, *MNRAS*, 491, 13J

6. *The ASAS-SN Catalog of Variable Stars IV: Periodic variables in the APOGEE survey*
   Pawlak, Michal et al. 2019, *MNRAS*, 487, 5932P

7. *The ASAS-SN Catalog of Variable Stars III: Variables in the Southern TESS Continuous Viewing Zone*
   Jayasinghe, T. et al. 2018, *MNRAS*, 485, 961J

8. *The ASAS-SN Bright Supernova Catalog - IV. 2017*
   Holoien, T. W.-S., et al. 2019, *MNRAS*, 484, 1899H

9. *The ASAS-SN Catalog of Variable Stars II: Uniform Classification of 412,000 Known Variables*
   Jayasinghe, T. et al. 2019, *MNRAS*, 486, 961J

10. *An All-Sky Search For R Coronae Borealis Stars in ASAS-SN*
    Shields, J. V. et al. 2019, *MNRAS*, 483, 4470S

11. *K2 Observations of SN 2018oh Reveal a Two-Component Rising Light Curve for a Type Ia Supernova*
    Dimitriadis, G. et al. 2019, *ApJ*, 870L, 1D

12. *Photometric and Spectroscopic Properties of Type Ia Supernova 2018oh with Early Excess Emission from the Kepler 2 Observations*
    Li, W. et al. 2019, *ApJ*, 870, 12L

13. *Seeing Double: ASASSN-18bt Exhibits a Two-Component Rise in the Early-Time K2 Light Curve*
    Shappee, B. J, et al. 2019, *ApJ*, 870, 13S

14. *ASASSN-18ey: The Rise of a New Black Hole X-Ray Binary*
    Tucker, M. A. et al. 2018, *ApJ*, 867, L9

15. *The ASAS-SN catalogue of variable stars I: The Serendipitous Survey*
    Jayasinghe, T. et al. 2018, *MNRAS*, 477, 3145

16. *ASASSN-18di: Discovery of a Powerful Flare on a Mid-M Dwarf*
    Rodríguez, R. et al. 2018, *RNAAS*, 2b, 8

17. *The ASAS-SN bright supernova catalogue - III. 2016*
    Holoien, T. W.-S. et al. 2017, *MNRAS*, 471, 4966

18. *Survey of period variations of superhumps in SU UMa-type dwarf novae. IX. The ninth year (2016-2017)*
    Kato, Taichi et al. 2017, *PASP*, 69, 75K

19. *The All-Sky Automated Survey for Supernovae (ASAS-SN) Light Curve Server v1.0*
    Kochanek, C. S. et al. 2017, *PASP*, 129, 104502