Jack Schulte

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Education

2021 – present ◇ **Ph.D. Astrophysics & Astronomy**, Michigan State University
Advisor: Dr. Joseph Rodriguez
Area of Interest: Formation and evolution of hot Jupiters

2021 – 2023 ◇ **M.S. Astrophysics & Astronomy**, Michigan State University

2017 – 2021 ◇ **B.S. Physics**, Arizona State University
Advisor: Dr. Maitrayee Bose
Area of Interest: Origins of presolar grains
Minor: Astrophysics
Summa Cum Laude
Barrett, The Honors College

Research Interests

- **Giant planet formation and evolution**: Discovering and characterizing hot Jupiters in order to construct a homogeneous sample of system parameters to test migration models
- **Planet engulfment**: Finding signatures of engulfed planets in subgiant stars and connecting engulfment events to giant planet migration
- **Presolar grains as tracers**: Using presolar grains and models of stellar evolution and nucleosynthesis to glean information about the solar neighborhood 4.6 billion years ago

Teaching

Spring 2023 ◇ **AST 208: Planets and Telescopes**, Michigan State University
I acted as a grader for this astronomy course designed for astronomy undergraduates. In addition, I hosted weekly office hours and led several lab sessions.

Spring 2022 – Fall 2022 ◇ **ISP 205L: Visions of the Universe**, Michigan State University
Each semester, I was the primary instructor for one section and the secondary instructor for another section of this astronomy lab course designed for non-STEM majors. In each class, I presented a 20-30 minute mini-lecture. I also redesigned several labs and designed and ran planetarium shows. Class sizes ranged from 50-100 students.

Fall 2021 ◇ **PHY 191: Physics Laboratory for Scientists**, Michigan State University
I led three sections, each containing 20 students, in a weekly three-hour lab designed to teach the fundamentals of physics (mechanics) to science and engineering undergraduates. This involved preparing 10-20 minute chalkboard mini-lectures followed by a hands-on demonstration of the lab.

Positions

2023 – present ◇ **Graduate Research Assistant**, Michigan State University
Advisor: Dr. Joseph Rodriguez
Leading the Migration and Evolution of giant ExoPlanets (MEEP) survey to discover and characterize all remaining hot Jupiters orbiting bright Sun-like stars with NASA's TESS mission.

2021 – 2023 ◇ **Graduate Teaching Assistant**, Michigan State University
Advisor: Dr. Joseph Rodriguez
Acted as a teaching assistant/section lead and grader for physics and astronomy courses for undergraduates.

2019 – 2021 ◇ **Research Aide**, Lunar Reconnaissance Orbiter Camera
Advisor: Dr. Mark Robinson
Built spatiotemporal maps to track the movement and activities of the astronauts in each of the Apollo missions. Built `python` scripts to automate much of the grunt work.

2018 – 2021 ◇ **Undergraduate Research Assistant**, Arizona State University
Advisor: Dr. Maitrayee Bose
Used 3D core-collapse supernova models to constrain the origins of presolar stardust grains.

Publications

Journal Articles

1. **J. Schulte**, J. E. Rodriguez, A. Bieryla, *et al.*, "Migration and Evolution of giant ExoPlanets (MEEP) I: Nine Newly Confirmed Hot Jupiters from the TESS Mission," *arXiv e-prints*, arXiv:2401.05923, arXiv:2401.05923, Jan. 2024. DOI: 10.48550/arXiv.2401.05923. arXiv: 2401.05923 [astro-ph.EP].

2. E. A. Gilbert, A. Vanderburg, J. E. Rodriguez, *et al.*, "A Second Earth-sized Planet in the Habitable Zone of the M Dwarf, TOI-700," *The Astrophysical Journal Letters*, vol. 944, no. 2, L35, p. L35, Feb. 2023. DOI: 10.3847/2041-8213/acb599. arXiv: 2301.03617 [astro-ph.EP].

3. J. E. Rodriguez, S. N. Quinn, A. Vanderburg, *et al.*, "Another shipment of six short-period giant planets from TESS," *Monthly Notices of the Royal Astronomical Society*, vol. 521, no. 2, pp. 2765–2785, May 2023. DOI: 10.1093/mnras/stad595. arXiv: 2205.05709 [astro-ph.EP].

4. S. P. Schmidt, K. C. Schlaufman, K. Ding, *et al.*, "Verification of Gaia DR3 Single-lined Spectroscopic Binary Solutions With Three Transiting Low-mass Secondaries," *arXiv e-prints*, arXiv:2310.07936, arXiv:2310.07936, Oct. 2023. DOI: 10.48550/arXiv.2310.07936. arXiv: 2310.07936 [astro-ph.SR].

5. T. W. Carmichael, J. M. Irwin, F. Murgas, *et al.*, "TOI-2119: a transiting brown dwarf orbiting an active M-dwarf from NASA's TESS mission," *Monthly Notices of the Royal Astronomical Society*, vol. 514, no. 4, pp. 4944–4957, Aug. 2022. DOI: 10.1093/mnras/stac1666. arXiv: 2202.08842 [astro-ph.SR].

6. **J. Schulte**, M. Bose, P. A. Young, and G. S. Vance, "Three-dimensional Supernova Models Provide New Insights into the Origins of Stardust," *The Astrophysical Journal*, vol. 908, no. 1, 38, p. 38, Feb. 2021. DOI: 10.3847/1538-4357/abcd41. arXiv: 2011.07459 [astro-ph.HE].

Conference Proceedings

1. **J. Schulte** and J. Rodriguez, "The Migration and Evolution of Eccentric Planets (MEEP) Survey," in *AAS/Division of Dynamical Astronomy Meeting*, ser. AAS/Division of Dynamical Astronomy Meeting, vol. 55, Sep. 2023, 205.09, p. 205.09.

2. N. R. Gonzales, **J. A. Schulte**, V. Tewary, *et al.*, "Pedal to the Metal: Apollo 15 Spatiotemporal Mapping of Act II of Manned Lunar Exploration," in *53rd Lunar and Planetary Science Conference*, ser. LPI Contributions, vol. 2678, Mar. 2022, 2672, p. 2672.

3. M. Bose, **J. Schulte**, G. Vance, R. A. Jansen, and P. Young, "Heterogeneous R-Process Chromium and Titanium Ejecta from Core Collapse Supernova Ejecta Polluted Our Solar System," in *52nd Lunar and Planetary Science Conference*, ser. Lunar and Planetary Science Conference, Mar. 2021, 1414, p. 1414.
4. N. R. Gonzales, **J. A. Schulte**, and M. S. Robinson, "In the Footsteps of the First: Apollo 14 Spatiotemporal Map," in *5th Planetary Data Workshop & Planetary Science Informatics & Analytics*, ser. LPI Contributions, vol. 2549, Jun. 2021, 7062, p. 7062.
5. M. Bose, S. Starrfield, P. A. Young, G. Vance, and **J. Schulte**, "Origins of O-Anomalous Stardust Using New Nova and Supernova Modeling," in *51st Annual Lunar and Planetary Science Conference*, ser. Lunar and Planetary Science Conference, Mar. 2020, 1117, p. 1117.
6. N. R. Gonzales, **J. A. Schulte**, M. R. Henriksen, R. V. Wagner, and M. S. Robinson, "Tremors and Tracks: Tracing the Apollo 12 Astronauts Through Time," in *51st Annual Lunar and Planetary Science Conference*, ser. Lunar and Planetary Science Conference, Mar. 2020, 1578, p. 1578.
7. **J. Schulte**, M. Bose, P. Young, and G. Vance, "The Supernova Origins of Rare Stardust Enriched with 13C and 15N," in *51st Annual Lunar and Planetary Science Conference*, ser. Lunar and Planetary Science Conference, Mar. 2020, 1268, p. 1268.
8. **J. Schulte**, M. Bose, P. Young, and G. Vance, "Using Symmetric and Asymmetric Three-Dimensional Supernova Models to Constrain the Origins of Presolar SiC Grains," in *50th Annual Lunar and Planetary Science Conference*, ser. Lunar and Planetary Science Conference, Mar. 2019, 1746, p. 1746.

Conferences

- September 2023 ◇ **Giant Magellan Telescope Community Science Meeting**: Washington D.C. (contributed poster)
- June 2023 ◇ **Emerging Researchers in Exoplanet Science**: New Haven, CT (contributed talk)
- May 2023 ◇ **Division on Dynamical Astronomy**: East Lansing, MI (contributed poster)
- October 2022 ◇ **Great Lakes Exoplanet Area Meeting**: Columbus, OH (contributed talk)
- June 2022 ◇ **Emerging Researchers in Exoplanet Science**: State College, PA (contributed poster)
- April 2020 ◇ **Arizona Space Grant Consortium Statewide Symposium**: Tempe, AZ (contributed talk)
- February 2020 ◇ **ASU School of Earth and Space Exploration Research Symposium**: Tempe, AZ (contributed poster)
- April 2019 ◇ **Arizona Space Grant Consortium Statewide Symposium**: Tempe, AZ (contributed talk)
- March 2019 ◇ **Lunar and Planetary Science Conference**: The Woodlands, TX (contributed talk)

Seminars and Colloquia

- May 2023 ◇ **JPL Virtual Exoplanet Lecture Series**, NASA Jet Propulsion Laboratory (invited)

Workshops

- August 2023 ◇ **VPLanet**, Virtual
  Simulated planet obliquity and rotation for a multi-planet system
- July 2023 ◇ **Sagan Exoplanet Workshop**, Virtual
- July 2022 ◇ **Sagan Exoplanet Workshop**, Virtual
- July 2021 ◇ **Sagan Exoplanet Workshop**, Virtual

Outreach and Service

- Currently a graduate student leader/mentor for the MSU Observatory Research Program, a program designed to give undergraduates experience observing with a 0.6-m telescope.
- Active leader of MSU Public Observing Nights, which regularly see hundreds of attendees visiting MSU's campus observatory. I give tours of the observatory's dome and telescope and train volunteers on operating the 0.6-m telescope as well as smaller electronic telescopes.
- Mentored two students through MSU's Stellar Mentorship program, which connects graduate and undergraduate astronomy students with mentors and mentees at similar stages of their academic careers.
- Member of MSU's Astro Coffee Committee, where I seek speakers to present papers to the department twice a week.

Awards

2024 ◇ **Outreach Award** (for public outreach at MSU observatory)

2022 ◇ **Harlo Mork Graduate TA Excellence in Teaching Award**

2018-2021 ◇ **ASU/NASA Space Grant** ($11,200 over seven semesters to pursue research at the School of Earth and Space Exploration)

2020 ◇ **ASU President's Scholarship granting** ($15,000 to one student for travel to Antarctica in December 2020)

2019 ◇ **Nininger Student Travel Award** ($1000 for travel to the 50th Lunar and Planetary Science Conference)

2017-2021 ◇ **Dean's list**