Samson A. Johnson

Curriculum Vitae

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Education

PhD Candidate in Astronomy 2016-2022 (expected)
Advisor: B. Scott Gaudi, The Ohio State University Columbus, Ohio
Thesis: Predictions for Exoplanet Demographics from the Roman Galactic Exoplanet Survey
- Dean's Distinguished University Fellowship - Ann S. Tuttle Citizenship Award - NASA ExoExplorer 2021
- Roman Galactic Bulge Time Domain Survey Science Investigation Team - NSF GRFP Honorable Mention 2016

Physics BA, Mathematics BA, High Honors 2011-2015
Advisor: Nathan McCrady, University of Montana, Davidson Honors College Missoula, Montana
Thesis: Dispatch Scheduling to Maximize Exoplanet Yield
- MT University System Honors Scholarship - Horatio Alger MT Scholarship - Jack and Isabel Haynes Scholarship
- Cail Physical/Bio-Sciences Scholarship - Shallenberger/Alumni Association Scholarship in Physics

Employment

NASA Postdoctoral Fellow, Jet Propulsion Laboratory June 2022-June. 2025
Accepted a NASA Postdoctoral Program Fellowship to begin June 2022. Will explore combining exoplanet demographic statistics from multiple detection methods and further Roman Galactic Bulge Time Domain Survey preparations.

Summer Research Intern, Jet Propulsion Laboratory May-Aug. 2019
Constructed a two dimensional map of differential reddening and extinction towards the Galactic Center using data from the infrared, ground-based microlensing survey conducted by UKIRT.

Research Assistant, Harvard-Smithsonian Center for Astrophysics Aug. 2015-July 2016
Refined site operation software for MINERVA robotic exoplanet detection telescope array. Developed software for automation of precision RV spectrograph, monitored daily operations, contributed to proposals.

Research Assistant, University of Montana June 2014-June 2015
Designed and tested dispatch scheduling software/simulation for use with MINERVA. Integrated simulations into forward modeling code to optimize exoplanet survey strategy.

Laboratory Assistant, University of Montana Winter 2011, Summer 2013
Assisted with developing space science instrument to measure ISM passing through the heliopause. Assembled vacuum chambers, handled vacuum specific hardware. Designed, constructed framework for vacuum pumps and chambers

Deli Staff, Good Food Store, Missoula, MT April 2012-Oct. 2014
Customer service, teamwork, task management. Received multiple commendations on helpfulness and safety.

Warehouse Picker, The Huckleberry People, Missoula, MT Sept. 2011-April 2012
Production based job working in warehouse environment. Time management, order assembly, manual dexterity.

Supervisor, Papa Murphy's Pizza, Missoula, MT July 2009-Sept. 2011
Delegated tasks to crews of 5-10 members. Customer service, problem solving, conflict resolution.

Advising

Aiden Zelakiewicz (undergraduate), The Ohio State University, 2021-present: Refined code to create extinction and differential reddening maps towards the Galactic Center using infrared, ground based microlensing survet conducted by UKIRT.
Rachel Slaybaugh (undergraduate), The Ohio State University, 2021-present: Adapted microlensing simulations for Roman to be used for constraining the fraction of the Galactic Halo's mass made up by primordial black holes through a microlensing survey toward M31.
Abigail Aronica (undergraduate), The Ohio State University, 2019-present: Developing an in-house Galactic population synthesis model for use in microlensing survey simulations. Modular and open source.
Kit Fieldhouse (high school), University of Montana, 2014-2015: Developed software to automate follow-up observation scheduling of KELT transiting planet candidates. Presented at national science fairs.

Outreach

- Polaris Mentor 2019-2021 (group enhancing retention of underrepresented undergrads in physics/astronomy)
- Academic Facilitator for URSA 2021 (undergradute early arrival program associated with Polaris)
- Mentor for new astronomy graduate students at Ohio State University (2019-2020)
- Star Party guest observer assistant, Astronomical Society at OSU, 2 nights
- Council of Graduate Students, Committee on Diversity and Inclusion, member, 2017-2018, Columbus, Ohio
- Breakfast of Science Champions, coordinator and volunteer, 2017-2020 - Columbus, Ohio
- Science Olympiad, Astronomy portion exam proctor, 04/2017 - Columbus, Ohio
- Ohio Supercomputer Center Summer Institute 07/2017, high school mentor - Columbus, Ohio
- Astronomy on Tap lecture, 2017 - Columbus, Ohio
- Blue Mountain Observatory public viewing nights, assistant for 4 nights, 2014 - Missoula, Montana

Teaching/Mentoring

- Ohio State, Polaris Mentor of undergraduates S. Petz & C. Roper (2019-2020), A. Cooper (2020-2021), D. Crocker & E. Meyer (2021-2022)
- Ohio State, Methods of Astronomical Observation & Data Analysis (Astron 3350, GTA 2018)
- Ohio State, Life in the Universe (Astron 1141, GTA 2019)
- Ohio State, From Planets to the Cosmos: Lab Section (Astron 1150, GTA 2019)

Service

- Referee for ApJ, MNRAS
- ExoExplorer, NASA Exoplanet Exploration Program and ExoPAG Executive Secretary, 2021
- Election Committee, OSU Astronomy Graduate Student Representative, summer 2021
- Assistant in graduate admissions, Ohio State, spring 2020
- Lead graduate student organizer of graduate admissions, Ohio State, spring 2019
- Lead graduate student organizer for feedback in astronomy faculty search, Ohio State, spring 2018
- Graduate Order of Magnitude group, co-founder, 2017-2019, Columbus, Ohio

Observing Experience

- MINERVA, Mt Hopkins, Arizona - 4x0.7 meter, 9 weeks on site, including spectrograph commissioning
- CTIO, La Serena, Chile, - SMARTS 1.3 meter, 14 nights of microlensing observing
- Large Binocular Telescope, Mt Graham, Arizona - 2x8.4 meter, 10 nights queue
- Tillinghast Telescope, Mt Hopkins, Arizona - 1.5 meter, 2 nights queue

Conferences and Workshops

Insights into Exoplanet Demographics from the Roman Galactic Exoplanet Survey✿ "✿" - invited
Yale University Exoplanets and Stars Seminar, 01/2021, invited seminar

Science Enabled by the Roman Galactic Exoplanet Survey✿
Exoplanet Explorers Science Series, 02/2021, 30 min invited talk, **link to recording**

The Roman Galactic Exoplanet Survey: Prospects for Constraining the Frequency of Earth-Analogs
American Astronomical Society 235 Meeting, 01/2021, 5 min talk

The Roman Galactic Exoplanet Survey: Prospects for Constraining the Frequency of Earth-Analogs✿
KIPAC Tea Talk, 11/2020, invited 15 min talk

The Roman Galactic Exoplanet Survey: Predictions for the Free-Floating Planet Detection Rate
NExScI Exoplanet Demographics, 11/2020, 15 min talk, **link to recording**

The Roman Galactic Exoplanet Survey: Prospects for Constraining the Frequency of Earth-Analogs
Harvard-Smithsonian Center for Astrophysics GCSP Seminar, 09/2020, 20 min talk, **link to recording**

The Roman Galactic Exoplanet Survey: Prospects for Constraining the Frequency of Earth-Analogs
Bay Area Exoplanet Meeting 34, 09/2020, 20 min talk

The WFIRST Microlensing Survey: Constraints on the frequency of Earth-analogs
Exoplanets III, 08/2020, 15 min talk

Sagan Summer Workshop: Astrobiology for Astronomers

NASA Exoplanet Science Institute, 07/2019, Attendee

The WFIRST Microlensing Survey: Predictions of the Free Floating Planet Detection Rate
Science in Our Own Backyard: Exploring the Galaxy...with WFIRST, 06/2019, 15 min talk

The WFIRST microlensing survey: mission updates and predictions of the free-floating planet yield
23rd International Microlensing Conference, 01/2019, 15 min talk

Measuring the abundance of free floating planets with WFIRST
Emerging Researchers in Exoplanet Science IV, Penn State, 08/2018, 15 minute talk

Sagan Summer Workshop: Microlensing in the Era of WFIRST
NASA Exoplanet Science Institute, 07/2017, Attendee

Synopsis of the MINiature Exoplanet Radial Velocity Array (MINERVA),
Emerging Researchers in Exoplanet Science III, Yale University, 07/2017, 15 minute talk

Dispatch Scheduling to Maximize Exoplanet Detection,
SPIE Astronomical Telescopes + Instrumentation, 07/2016, 15 minute talk

Dispatch Scheduling to Maximize Exoplanet Detection,
American Astronomical Society 227 Meeting, poster

Optimization of the MINERVA Exoplanet Search Strategy via Simulations,
American Astronomical Society 225 Meeting, poster

Publications (ADS Library)

h-index (first author): 8 (3) – citations (first author): 161 (52)

First Author

1. A Multi-Parameter Degeneracy in Microlensing Events with Extreme Finite Source Effects
   Johnson, S. A., Penny, M. T., Gaudi, B. S., 2021, arxiv:2109.08161
2. Predictions of the Nancy Grace Roman Space Telescope Galactic Exoplanet Survey II: Free-Floating Planet Detection Rates
   Johnson, S. A., Penny, M. T., Gaudi, B. S., et al. 2020, AJ, 160, 123
   Media: nasa.gov feature, CNN, EurekAlert, Forbes, Smithsonian Magazine
3. The Quiescent Progenitors of Type II Supernovae
   Johnson, S. A., Kochanek, C. S., Adams, S. M., 2018, MNRAS, 480, 1696
4. On the Progenitor of the Type Ibc Supernova 2012fh
   Johnson, S. A., Kochanek, C. S., Adams, S. M., 2017, MNRAS, 472, 3115
5. The Radial Velocity of OGLE-2015-BLG-0966S
   Johnson, S. A., Yee, J. C., 2017, PASP, 129, 074401

Coauthor

1. OGLE-2019-BLG-0960Lb: The Smallest Microlensing Planet
   Yee, J. C., Zang, W., Udalski, A., et al. 2021, arXiv:2101.04696
2. Revealing Short-period Exoplanets and Brown Dwarfs in the Galactic Bulge using the Microlensing Xallarap Effect with the Nancy Grace Roman Space Telescope
   Miyazaki, S., Johnson, S. A., Sumi, T., et al. 2021, ApJ, 161, 84.
   Media: nasa.gov feature, EurekAlert
3. The HD 217107 Planetary System: Twenty Years of Radial Velocity Measurements
   Giovinazzi, M. R., Blake, C. H., Eastman, J. D., et al. 2020, Astronomische Nachrichten, 1, 9
4. A Full Implementation of Spectro-Perfectionism for Precise Radial Velocity Exoplanet Detection: A Test Case With the MINERVA Reduction Pipeline
   Cornachione, M. A., Bolton, A. S.; Eastman, J. D., et al, 2019, PASP, 131, 124503

5. Minerva-Australis. I. Design, Commissioning, and First Photometric Results
   Addison, B., Wright, D. J., Wittenmyer, R. A., et al. 2019, PASP, 131, 115003
6. First Radial Velocity Results From the MINiature Exoplanet Radial Velocity Array (MINERVA)
   Wilson, M. L., Eastman, J. D., Cornachione, M. A., et al. 2019, PASP, 131, 115001
7. KELT-22Ab: A Massive, Short-Period Hot Jupiter Transiting a Near-solar Twin
   Labadie-Bartz, J., Rodriguez, J. E., Stassun, K. G., et al. 2019, ApJS, 240, 13
8. KELT-19Ab: A…Hot Jupiter Transiting a Likely Am Star with a Distant Stellar Companion
   Siverd, R. J., Collins, K. A., Zhou, G., et al. 2018, AJ, 155, 35
9. KELT-20b: A giant planet with a period of P∼3.5 days transiting the…early A star HD 185603
   Lund, M. B., Rodriguez, J. E., Zhou, G., et al. 2017, AJ, 154, 194
10. The Mysterious Dimmings of the T Tauri Star V1334 Tau
    Rodriguez, J. E., Zhou, G., Cargile, P. A., et al. 2017, ApJ, 836, 209

Non-Refereed

1. Measurement of the Free-Floating Planet Mass Function with Simultaneous Euclid and WFIRST Microlensing Parallax Observations
   Penny, M. T., Bachelet, E., Johnson, S. A., et al., Astro2020 Decadal Survey White Paper
2. The Scientific Context of WFIRST, Microlensing in the 2020s
   Yee, J. et al, Astro2020 Decadal Survey White Paper