

Justin R. Hom

GRADUATE RESEARCH ASSOCIATE · PHD CANDIDATE · ASTROPHYSICS

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Education

- School of Earth and Space Exploration, Arizona State University, 2017-
 - Current fourth year doctoral student, PhD Candidate, 3.98 GPA
 - Primary Advisor: Dr. Jennifer Patience; Secondary Advisor: Dr. Michael Line
- University of California, Berkeley 2012-2016
 - Bachelor of Arts in Astrophysics, 3.42 Major GPA
 - Bachelor of Arts in Physics, 3.27 Major GPA

Research Experience

- High Resolution Imaging of Circumstellar Disks
 - Debris disk characterization and forward-modeling with a variety of debris disks from the Gemini Planet Imager Exoplanet Survey (GPIS)
 - PSF subtraction and image reduction for directly imaged debris disks around the stars HD 32297 and HR 4796A
 - PSF subtraction and image reduction for MCFOST generated debris disk models of HR 4796A
 - Telescope observations for GPIS and Keck-NIRC2
- Brown Dwarf Spectral Analysis and Characterization
 - Spectral analysis and characterization of directly imaged brown dwarfs
 - Experience with reducing HST WFC3 grism and spectral data
 - Modeling brown dwarf atmospheres with CHIMERA radiative convective model
 - Observations of Brown Dwarfs with LBTI-LMIRCam.
 - Observations of Brown Dwarfs using Keck-OSIRIS.

Publications

1. **Hom, J.**, Patience, J., Chen, C. et al., *A Uniform Analysis of Debris Disk Morphology with the Gemini Planet Imager*, In Prep
2. **Hom, J.**, Patience, J., Knierman, K. et al., *Introduction to Astronomical Imaging as a Course-Based Undergraduate Research Experience*, In Prep
3. **Hom, J.**, Patience, J., Esposito, T. et al., *First Scattered-Light Images of Four Debris Disks in Scorpius-Centaurus with the Gemini Planet Imager*, 2020, AJ, 159, 31H

4. Duchêne, G., **Hom, J.**, Rice, M. et al., *The Gemini Planet Imager View of the HD 32297 Debris Disk*, 2020, AJ, 159, 251D
5. Crotts, K. A., Matthews, B., and 17 co-authors including **Hom, J.**, *A Deep Polarimetric Study of the Asymmetrical Debris Disk HD 106906*, 2021, ApJ, 915, 58C
6. Ward-Duong, K., Patience, J., and 56 co-authors including **Hom, J.**, *Gemini Planet Imager Spectroscopy of the Dusty Substellar Companion HD 206893 B*, 2021, AJ, 161, 5W
7. Mazoyer, J., Arriaga, P., **Hom, J.**, et al., *DiskFM: A forward modeling tool for disk analysis with coronagraphic instruments*, 2020, SPIE, 11447E, 59M
8. Arriaga, P., Fitzgerald, M., and co-authors including **Hom, J.**, *Multiband Polarimetric Imaging of HR 4796A with the Gemini Planet Imager*, 2020, AJ, 160, 79A
9. Bruzzone, S., Metchev, S., and 54 co-authors including **Hom, J.**, *Imaging the 44 AU Kuiper Belt-analogue Debris Ring around HD 141569A with GPI Polarimetry*, 2020, AJ, 159, 53S
10. Chen, C., Mazoyer, J., and 33 co-authors including **Hom, J.**, *Multiband GPI Imaging of the HR 4796A Debris Disk*, 2020, ApJ, 898, 55C
11. De Rosa, R., Nielsen, E., and 52 co-authors including **Hom, J.**, *An Updated Visual Orbit of the Directly-Imaged Exoplanet 51 Eridani b and Prospects for a Dynamical Mass Measurement with GAIA*, 2020, AJ, 159, 1D
12. Esposito, T., Kalas, P., and 61 co-authors including **Hom, J.**, *Debris Disk Results from the Gemini Planet Imager Exoplanet Survey's Polarimetric Imaging Campaign*, 2020, AJ, 160, 24E
13. Nguyen, M., De Rosa, R., and 52 co-authors including **Hom, J.**, *HD 165054: An Astrometric Calibration Field for High-Contrast Imagers in Baade's Window*, 2020, AJ, 159, 244N
14. Nielsen, E., De Rosa, R., and 62 co-authors including **Hom, J.**, *The Gemini Planet Imager Exoplanet Survey: Giant Planet and Brown Dwarf Demographics From 10–100 AU*, 2019, AJ, 158, 13N
15. De Rosa, R., Nielsen, E., and 52 co-authors including **Hom, J.**, *Detection of a Low-Mass Stellar Companion to the Accelerating A2IV Star HR 1645*, 2019, AJ, 158, 226D

Awards and Honors

- Arizona State University Graduate Completion Fellowship, August 2022
- National Science Foundation Graduate Research Fellowship Program, 2019 Honorable Mention
- Graduate and Professional Student Association Travel Grant, September 2019
- NASA Exoplanet Science Institute Sagan Workshop Grant, July 2018

Posters and Talks

1. *Disk Forward-Modeling Results from a Uniform Study of Directly Imaged Debris Disks with the Gemini Planet Imager*, 241st AAS Meeting, January 2023
2. *A Uniform Analysis of Debris Disk Morphology with the Gemini Planet Imager*, Exoplanets IV, May 2022
3. *A Uniform Analysis of Directly Imaged Debris Disk Morphology with the Gemini Planet Imager*, 2021 NExSci Sagan Exoplanets Workshop, August 2021

4. *A Uniform Analysis of Directly Imaged Debris Disks with the Gemini Planet Imager*, 2021 Emerging Researchers in Exoplanet Science Workshop, July 2021
5. *A Uniform Analysis of Directly Imaged Debris Disks with the Gemini Planet Imager*, 237th AAS Meeting, January 2021
6. *A Uniform Analysis of Directly Imaged Debris Disks*, 236th AAS Meeting, June 2020
7. *Comparison of PSF Subtraction Algorithms on Disk Imaging Data*, In the Spirit of Lyot, Tokyo, Japan, October 2019
8. *First Scattered Light Images of Four Debris Disks in Scorpius Centaurus; the MMT Adaptive optics exoPlanet characterization System*, Center for Adaptive Optics (CfAO) Summer School, Santa Cruz, CA, USA, August 2019
9. *Directly Imaging Debris Disks Around Young Nearby Stars with the Gemini Planet Imager*, Talk at Keck Observatory, Waimea, HI, USA, July 2019
10. *First Scattered Light Detections of Four Debris Disks in Scorpius-Centaurus*, New Horizons in Planetary Systems, Victoria, BC, Canada, May 2019
11. *The Gemini Planet Imager View of the HD 32297 Debris Disk*, 7th Annual National Capital Area Disks Workshop (NCAD7), Baltimore, MD, USA, September 2018
12. *The Gemini Planet Imager View of the HD 32297 Debris Disk*, NExScl Sagan Exoplanets Workshop, Pasadena, CA, USA, July 2018
13. *The Gemini Planet Imager View of the HD 32297 Debris Disk*, Talk at the Center for Integrated Planetary Science Workshop (CIPS), Berkeley, CA, USA, April 2018
14. *The Gemini Planet Imager View of the HD 32297 Debris Disk*, Stars and Planet Formation in the Southwest (SPF2), Saddlebrooke, AZ, USA, March 2018

Awarded Telescope Time

1. *Atmospheric characterization of exoplanets and brown dwarf companions spanning the L-T temperature and gravity sequence*, Large Binocular Telescope Observatory, 2020B
2. *A Circumstellar Disk Survey of Low Mass Stars in Upper Scorpius*, Keck Observatory, 2020A
3. *GPI Deep Imaging of the Newly Resolved HD 98363 Disk*, Gemini Observatory, 2020A
4. *Atmospheric characterization of exoplanets and brown dwarf companions spanning the L-T temperature and gravity sequence*, Large Binocular Telescope Observatory, 2020A
5. *Exoplanet and brown dwarf companions in the ScoCen association and the Field – Defining an empirical sequence*, Large Binocular Telescope Observatory, 2019A
6. *GPI Deep Imaging of the Newly Resolved HD 146181 Disk*, Gemini Observatory, 2019A
7. *An empirical mid-IR sequence to explore degenerate effects on the atmospheres of brown dwarfs and exoplanets*, Large Binocular Telescope Observatory, 2018B

Teaching Experience

- Graduate Teaching Assistant for Arizona State University, 2019-2022
 - Teaching and reviewing student material for Astronomy related classes for both majors and non-majors, in topics that include but are not limited to planetary science, stellar physics, galactic structure, cosmology, observational astronomy, and computer programming for astrophysics research

- Graduate Mentoring for Arizona State University, 2020-2021
 - Mentoring new graduate students in adjusting to the graduate school experience
- Undergraduate Mentoring for Arizona State University, 2018-
 - Mentoring undergraduate students in conducting astrophysics research
- Sundial Mentoring Program, 2018-2020
 - Mentoring first year undergraduates in academic studies in STEM and conducting research, 2018-2020
- Assignment Grader for UC Berkeley Astronomy Department, 2015-2017
 - Graded assignments for both the introductory astronomy class and the upper division stellar physics class, reported student progress to instructors
- SY Academy, Berkeley, CA, 2015
 - Tutored a group of Chinese international students enrolled in a general astronomy summer course, gave weekly problems to work on and taught material from the class.

Skills

- Computer programming in Python, MATLAB, IDL
- Experience in data reduction and analysis of Hubble Space Telescope (Wide Field Camera 3) Data
- Experience in data reduction and analysis of Keck Observatory (OSIRIS and NIRC2) Data
- LaTeX for document writing
- Writing HTML5 for web design
- Microsoft Word, Excel, Powerpoint, and Outlook.
- Ability to work well independently and in team environments

Community and Extracurricular Activities

- Sexual Violence and Sexual Harassment Prevention workshop facilitator, 2020-
- SESE Graduate Student Council: Diversity, Equity, and Inclusion Advocate, 2019-2021
- Astronomy Graduate Student Journal Club Facilitator, 2019-2021
- SESE Open House, active volunteer 2017-2020
- Undergraduate Astronomy Society, UC Berkeley, 2015-2016

References

- Jennifer Patience, Assoc. Professor of Astronomy
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- Gaspard Duchêne, Assoc. Researcher of Astronomy
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- Christine Chen, Assoc. Astronomer
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- Karen Knierman, Assistant Teaching Professor
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- Anna Zaniowski, Academic Professional
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