Dr. Johanna M. Vos

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Professional Appointments

Postdoctoral Fellow 2018–2023
Department of Astrophysics, American Museum of Natural History, USA

Principal's Career Development Teaching Scholar 2014-2018
Institute for Astronomy, University of Edinburgh, UK

Education

Institute for Astronomy, University of Edinburgh 2014–2018
PhD in Astronomy
Advisor: Prof. Beth A. Biller
2018 Winton Astronomy Thesis Prize

Trinity College Dublin 2010–2014
BA (Mod) Physics with Astrophysics
Graduated with First Class Honours (I)

Grants & Awards

Royal Society - Science Foundation Ireland University Research Fellowship 2022
Hubble Space Telescope General Observer Grant, *Space Telescope Science Institute* 2021
Keck PI Data Award, *NASA JPL* 2021
Hubble Space Telescope General Observer Grant, *Space Telescope Science Institute* 2019
Cool Stars 20 Conference Grant, *Boston University* 2018
Winton Thesis Prize, *University of Edinburgh* 2018
Principal's Go Abroad Fund, *University of Edinburgh* 2018
Exoclipse Conference Grant, *Boise State University* 2017
Principal's Career Development Teaching Scholarship *University of Edinburgh* 2014
First Class Book Prize, *Trinity College Dublin* 2011, 2012, 2013
Entrance Exhibition Scholarship, *Trinity College Dublin* 2010

Teaching Experience

Guest Lecturer, *Stanford University* 2021
Peering into Darkness: Research Practices in Contemporary Art & Astrophysics

Instructor, *American Museum of Natural History* 2019–2020
Designed and delivered "Stars" course for After School Program

Head Teaching Assistant, *University of Edinburgh* 2016–2018
Courses: Physics Experimental Lab, Computational Observational Astronomy Lab

Teaching Assistant, *University of Edinburgh* 2014–2018
Courses: Maths for Physics, Introductory Astrophysics, Discovering Astronomy

Research Advising

Undergraduate/Master's Students

Everett MacArthur, *Columbia University*	2022–Present
Mohammad Refat, *The Graduate Center, City University of New York*	2021–Present
Jose Adorno, *Queens College, City University of New York → University of Miami*	2020–2021
Allison McCarthy, *University of Alabama → Boston University*	2019–2020
+7 students as co-mentor	

High–School Students

BL Cadet, *Uncommon Prep Charter School*	2021–2022
Amelia Lobo-Jost, *Humanities Preparatory Academy High School*	2021–2022
Omar Piron, *Washington Heights Expeditionary Learning School*	2021–2022
Azul Ruiz Diaz, *Brooklyn Technical High School*	2020–2021
Jai Glazer, *The Dalton School*	2020–2021
Sophia Ameneyro, *University Neighborhood High School*	2020–2021
Izzy Lapidus, *Fiorello H. LaGuardia High School of Performing Arts*	2019–2020
Otis McCallum, *The Beacon School*	2019–2020
William McCartney, *New Explorations Into Science and Technology + Math*	2019–2020
Elko Gerville–Reache, *School of the Future*	2018–2019
Raunak Amanna, *Brooklyn Technical High School*	2018–2019
Nima Brivanlou, *Lycée Français de New York*	2018–2019

Service

Scientific Organizing Committee, Cloud 2 Con, Ringberg Castle, Germany	2022–2023
MSc Thesis External Examiner, *Stockholm University*	2022
European Southern Observatories Distributed Peer Review	2022
Grant Review Panel, *NASA*	2022
Time Allocation Committee, *TESS Guest Investigator Program*	2021
Time Allocation Committee, *NASA*	2019–2021
Journal Referee, *ApJ, ApJL, AJ, JURP*	2018–Present
Scientific Organizing Committee, Cloud Nine Con, Virtual	2021
Grant Reviewer, Swiss National Science Foundation	2020
American Astronomical Society Chambliss Poster Judge	2020, 2021
Astrophysics Seminar Organizer, American Museum of Natural History	2018–2020
Astronomy Representative, Postgraduate Forum, University of Edinburgh	2017–2018
Astronomy Postgraduate Committee Member, University of Edinburgh	2015–2016

Talks & Seminars

⋆ indicates invited or plenary talks

⋆ Exoplanets and Stars Seminar, Yale University	2022
⋆ Dean's Digital Café, New York Institute of Technology	2022
Contributed Talk, Flatiron Exoplanet Atmospheres Symposium, CCA, Flatiron Institute	2022
Contributed Talk, Other Worlds Laboratory, UC Santa Cruz	2022
Contributed Talk, Brown Dwarf–Exoplanet Connection Splinter, Exoplanets IV	2022
⋆ Seminar, Carnegie Earth and Planets Laboratory	2022
⋆ Colloquium, Queens College, City University of New York	2022

Contributed Talk, CHAMPS Exoplanet Early Career Highlight Seminar	2022
Contributed Talk, AAS Meeting 239 (cancelled due to Covid-19)	2022
Contributed Talk, Gotham Fest 2021, New York	2021
⋆ Colloquium, University of California, Santa Cruz	2021
⋆ Colloquium, University of Texas at Austin	2021
⋆ Colloquium, Center for Space and Habitability, University of Bern	2021
⋆ Colloquium, Trinity College Dublin	2021
Contributed Talk, American Astronomical Society Meeting 237	2021
⋆ Colloquium, Center for Computational Astrophysics, Flatiron Institute	2020
Contributed Talk, Exo-Webb Seminar Series	2020
⋆ Colloquium, NASA Goddard Space Flight Center	2020
Contributed Talk, American Astronomical Society Meeting 235, Honolulu, HI	2020
Contributed Talk, Gotham Fest 2019, New York	2019
⋆ Colloquium, Dublin Institute for Advanced Studies	2019
Contributed Talk, Other Worlds Laboratory, UC Santa Cruz, CA	2019
⋆ Review Talk, BDEXOCON, University of Delaware	2019
⋆ Colloquium, American Museum of Natural History	2019
Dissertation Talk, American Astronomical Society Meeting 233, Seattle, WA	2019
⋆ Plenary Talk, Cool Stars 20, Boston, MA	2018
Contributed Talk, Scottish Exoplanet and Brown Dwarf Meeting	2017
⋆ Colloquium, Royal Observatory of Edinburgh	2017
⋆ Invited Talk, European Southern Observatories, Santiago, Chile	2017
Contributed Talk, Exoclipe, Boise, ID	2017
Contributed Talk, Scottish Exoplanet and Brown Dwarf Meeting	2015
⋆ Seminar, Max Planck Institute for Solar System Research	2014

Selected Telescope Time

NRAO Very Large Array, 16 hrs, Co-I	2022
ESO Very Large Telescope (CRIRES), 10 hrs, Co-I	2022
South African Large Telescope, 35 hrs, **PI**	2022
Gemini/IGRINS Fast Turnaround Program, 4.4 hrs, **PI**	2022
NASA Keck/NIRSPEC, 0.5 nights, **PI**	2022
NRAO Very Large Array, 11 hr, Co-I	2022
ESO New Technology Telescope, 18 nights, Co-I	2021-2022
Hubble Space Telescope (6 orbits), **PI**	2021
James Webb Space Telescope Cycle 1, (24.6 hr), Co-I	2021
Gemini-S/IGRINS, (21 hr), **PI**	2021
Gemini-N/GNIRS & Gemini-S/IGRINS (13 hr), **PI**	2020
Gemini-S/IGRINS, 31 hr, **PI**	2020
Hubble Space Telescope (16 orbits) & Very Large Array (27.6 hr), **PI**	2019
Spitzer Space Telescope Director's Discretionary Time, 33.1 hr, **PI**	2019
Spitzer Space Telescope Medium Program, 70 hr, **PI**	2018
James Webb Space Telescope Early Release Science, 39 hr, Collaborator	2017
Spitzer Space Telescope (30.8 hr) & Very Large Array (33 hr), Co-I	2016–2018
Hubble Space Telescope (5 orbits) & Spitzer Space Telescope (17.6 hr), Co-I	2016
ESO New Technology Telescope, 29 nights, **PI**	2014–2017

Diversity & Outreach Efforts

Speaker for public events in Ireland, UK & US 2016–Present
Examples: Astronomy on Tap, Pint of Science Festival, Royal Observatory Winter Talks
Speaker for educational programs at AMNH 2018–Present
Examples: School visits, BridgeUP Scholars Program, After School Programs
Research Mentor, CUNY Astrocom NYC & NSF REU programs 2019–Present
Research experience for undergraduate students
Research Mentor, Science Research Mentoring Program, AMNH 2018–2022
Research experience for NYC high-school students
Subject Matter Expert, NASA Community College Network 2022–Present
Partnership with community college instructors and their students
Podcast Guest 2022–Present
Examples: The Planetary Society: Planetary Radio, The LIUniverse, Stemettes: Say What?
Volunteer, Stemettes 2020–Present
Resources, consulting and presentations for girls and non-binary people interested in STEM
Scientific Advisor & Speaker, About Us Festival UK 2022 2021–2022
Featured Scientist, 1400 Degrees 2022
Featured Scientist, 100DIGITS Campaign 2022
Featured Scientist, Million STEM 2020
STEM Ambassador, StemEast, UK & Ireland 2015-2018
Visited schools around Scotland and Ireland speaking about science research.
Contributor, University of Edinburgh Science Magazine, Women are Boring 2018
Workshop Leader, Kickstart Program, University of Edinburgh 2015, 2016
A week-long immersive university experience for secondary school students
Mentor, TYPE Program, Trinity College Dublin 2012
Transition Year Physics Experience for secondary school students

Recent Press

Royal Society announces University Research Fellowships for 2022 2022
AAS 239 Winter Meeting Press Conference 2022
Stemettes Say What? Podcast: What is the deal with Academia careers? 2022
Planetary Radio Podcast: Weather on brown dwarfs, and worlds on the eve of destruction 2022
The LIUniverse Podcast: Brown Dwarfs and Ballet 2022
California Academy of Sciences Universe Update 2022
NASA Jet Propulsion Laboratory Press Release 2022
Irish Times "Research Lives" Profile 2020
NRAO's 2020 Astronomy Highlights with Phil Plait 2020
Space.com Science & Astronomy Interview 2020
NASA Jet Propulsion Laboratory Press Release 2020

First Author Publications

⋆ indicates equal author contribution

1. Patchy Forsterite Clouds in the Atmospheres of Two Exoplanet Analogs
Vos, J. M.; Burningham, B.; Faherty, J. K.; Alejandro, S.; Gonzales, E. C., Calamari, E.;

Bardalez Gagliuffi, D.; Visscher, C.; Tan, X.; Morley, C. V.; Marley, M.; Gemma, M. E.; Whiteford, N.; Gaarn, J.; Park, G. *submitted to The Astrophysical Journal*, 2022.

2. Let The Great World Spin: Revealing the Turbulent, Stormy Nature of Giant Planet Analogs with the Spitzer Space Telescope
Vos, J. M.; Faherty, J. K.; Gagné J.; Marley, M.; Metchev, S.; Gizis, J.; Rice, E., L.; Cruz, K. *The Astrophysical Journal*, 924, 68, 2022.

3. A measurement of the wind speed on a brown dwarf
⋆Allers, K. N.; ⋆**Vos, J. M.**; ⋆Biller, B. A.; ⋆Williams, P. K.G. *Science,* 368, 6487, 169–172, 2020.

4. Spitzer Variability Properties of Young Giant Planet Analogs
Vos, J. M.; Biller, B. A.; Allers, K. N.; Faherty, J. K.; Liu, Michael C.; Eriksson, S.; Best, W. M. J.; Metchev, S.; Radigan, J.; Allers, K. N.; Janson, M.; Buenzli, E.; Dupuy, T. J.; Bonnefoy, M.; Manjavacas, E.; Brandner, W.; Crossfield, I.; Deacon, N.; Henning, T.; Homeier, D.; Schlieder, J., *The Astronomical Journal,* 160(1):38, 2020.

5. A search for variability in exoplanet analogues and low–gravity brown dwarfs
Vos, J. M.; Biller, B. A.; Bonavita, M.; Eriksson, S.; Liu, Michael C.; Best, W. M. J.; Metchev, S.; Radigan, J.; Allers, K. N.; Janson, M.; Buenzli, E.; Dupuy, T. J.; Bonnefoy, M.; Manjavacas, E.; Brandner, W.; Crossfield, I.; Deacon, N.; Henning, T.; Homeier, D.; Kopytova, T. Schlieder, J., *Monthly Notices of the Royal Astronomical Society,* 483:480–502, 2019.

6. Variability of the lowest mass objects in the AB Doradus moving group.
Vos, J. M.; Allers, K.. N.; Biller, B. A.; Liu, M. C.; Dupuy, T. J.; Gallimore, J. F.; Adenuga, I. J.; Best, W. M. J., *Monthly Notices of the Royal Astronomical Society*, 474(1):1041–1053, 2018.

7. The Viewing Geometry of Brown Dwarfs Influences Their Observed Colors and Variability Amplitudes
Vos, J. M.; Allers, K. N.; Biller, B. A., *The Astrophysical Journal*, 842(2):78, 2017.

Second Author Publications

8. On The Detection of Exomoons Transiting Isolated Planetary-Mass Objects
Limbach, M. A.; **Vos, J. M.**; Winn, J. N.; Heller, R.; Mason, J.; Schneider, A.; Dai, F., *The Astrophysical Journal Letters*, 918, L25, 2021.

9. Simultaneous Multiwavelength Variability Characterization of the Free–floating Planetary–mass Object PSO J318.5–22.
Biller, B. A.; **Vos, J. M.**; Buenzli, E.; Allers, K.; Bonnefoy, M.; Charnay, B.; Bézard, B.; Allard, F.; Homeier, D.; Bonavita, M.; Brandner, W.; Crossfield, I.; Dupuy, T.; Henning, T.; Kopytova, T.; Liu, M. C.; Manjavacas, E.; Schlieder, J., *The Astronomical Journal*, 155(2):95, 2018.

10. Variability in a Young, L/T Transition Planetary–Mass Object
Biller, B. A.; **Vos, J. M.**; Bonavita, M.; Buenzli, E.; Baxter, C.; Crossfield, I. J. M.; Allers, K.; Liu, M. C.; Bonnefoy, M.; Deacon, N.; Brandner, W.; Schlieder, J. E.; Dupuy, T.; Kopytova, T.; Manjavacas, E.; Allard, F.; Homeier, D.; Henning, T., *The Astrophysical Journal Letters*, 813(2):1–6, 2015.

Co–Author Publications

11. The TEMPO Survey I: Predicting Yields of the Transiting Exosatellites, Moons, and Planets from a 30-day Survey of Orion with the Nancy Grace Roman Space Telescope
Limbach, M. A.; Soares-Furtado, M.; Vanderburg, A.; Best, W. J.; Cody A. M.; D'Onghia, E.; Heller, R.; Hensley, B. S.; Kounkel, M.; Kraus, A.; Mann, A. M.; Robberto, M.; Rosen, A. L.; Townsend, R.; **Vos, J. M.** and the TEMPO Collaboration, submitted to *Publications of the Astronomical Society of the Pacific*, 2022.

12. The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems II: A 1 to 20 Micron Spectrum of the Planetary-Mass Companion VHS 1256–1257 b
Direct Imaging Community Early Release Science Team: Miles, B. E.; et al. +101 co-authors incl. **Vos, J. M.**, submitted to *The Astrophysical Journal*, August 2022

13. The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems I: High Contrast Imaging of the Exoplanet HIP 65426 b from $2 - 16$ μm
Direct Imaging Community Early Release Science Team: Carter, A. L.; et al. +107 co-authors incl. **Vos, J. M.**, submitted to *The Astrophysical Journal*, August 2022

14. Examining the Rotation Period Distribution of 40 Myr Tucana-Horologium with TESS
Popinchalk, M.; Faherty, J. K.; Curtis, J. L.; Gagne, J.; Bardalez Gagliuffi, D.; **Vos, J. M.**; Ayala, Andrew.; Gonzales, Lisseth.; Kiman, R., accepted for publication in *The Astrophysical Journal*, 2022.

15. The Perkins INfrared Exosatellite Survey (PINES) II. Transit Candidates and Implications for Planet Occurrence around L and T Dwarfs
Tamburo, P.; Muirhead, P. S.; McCarthy, A.; Hart, M.; **Vos, J. M.**; Agol, E.; Theissen, C.; Gracia, D.; Bardalez Gagliuffi, D.; Faherty, J. K., *The Astronomical Journal*, 164, 252, 2022.

16. An Atmospheric Retrieval of the Brown Dwarf Gliese 229B
Calamari, E.; Faherty, J. K.; Burningham, B.; Gonzales, E. C.; Bardalez Gagliuffi, D. ; **Vos, J. M.**; Gemma, M.; Whiteford, N.; Gaarn, J.; *The Astrophysical Journal*, 940, 2, 2022.

17. Informed Systematic Method to Identify Variable Mid- and Late-T Dwarfs
Oliveros-Gomez, N.; Manjavacas, E.; Ashraf, A.; Bardalez Gagliuffi, D.; **Vos, J. M.**; Faherty, J. K.; Karalidi, T.; Apai, D.; *The Astrophysical Journal*, 939, 72, 2022.

18. On The Unusual Variability of 2MASS J06195260–2903592: A Long-Lived Disk around a Young Ultracool Dwarf
Liu, M. C.; Magnier, E.; Zhang, Z.; Gaidos, E.; Liu, P.; Biller, B. A.; **Vos, J. M.**; Dupuy, T.; Allers, K. N.; Shappee, B. J.; Hinkle, J. T.; Constantinou, S. N. L.; Emerson, K. J.; Dennis, M. T.; *The Astronomical Journal*, 164, 4, 2022.

19. Disentangling the Signatures of Blended-Light Atmospheres in L/T Transition Brown Dwarfs
Ashraf, A.; Bardalez Gagliuffi, D.; Manjavacas, E.; **Vos, J. M.**; Faherty, J. K., *The Astrophysical Journal,* 934, 178, 2022.

20. Top-of-the-atmosphere and Vertical Cloud Structure of a Fast-rotating Late T Dwarf
Manjavacas, E.; Karalidi, T.; Tan, X.; **Vos, J. M.**; Lew, B. W. P.; Biller, B. A.; Oliveros-Gómez, N. L, *The Astronomical Journal*, 164, 65, 2022.

21. The Perkins INfrared Exosatellite Survey (PINES) I. Survey Overview, Reduction Pipeline, and Early Results

Tamburo, P.; Muirhead, P. S.; McCarthy, A.; Hart, M.; Gracia, D.; **Vos, J. M.**; Radigan, J.; Bardalez Gagliuffi, D.; Faherty, J. K.; Theissen, C.; Agol, E.; Skinner, J.; Sagear, S., *The Astrophysical Journal*, 168 (6), 253, 2022.

22. A Wide Planetary Mass Companion Discovered Through the Citizen Science Project Backyard Worlds: Planet 9
Faherty, J. K.; Gagné, J.; Popinchalk, M.; **Vos, J. M.**; Burgasser, A. J.; Schümann, J.; Schneider, A. C.; Davy Kirkpatrick, J.; Meisner, A. M.; Kuchner, M. J.; Bardalez Gagliuffi, D. C.; Marocco, F.; Caselden, D.; Gonzales, E.; Rothermich, A.; Casewell, S.; Debes, J. H.; Aganze, C.; Ayala, A.; Hsu, C.; Cooper, W.; Smart, R. L.; Gerasimov, R.; Theissen, C. and The Backyard Worlds Collaboration, *The Astrophysical Journal*, 923 (1), 48, 2021.

23. Revealing the Vertical Cloud Structure of an AB Pictoris b Analog through Keck I/MOSFIRE spectro–photometric variability
Manjavacas, E.; Karalidi, T.; **Vos, J. M.**; Biller, B. A.; Lew, B. W. P, *The Astronomical Journal*, 162 (5), 179, 2021.

24. Longitudinally Resolved Spectral Retrieval (ReSpect) of WASP–43b
Cubillos, P. E.; Keating, D.; Cowan, N. B.; **Vos, J. M.**; Burningham, B.; Ygouf, M.; Karalidi, T.; Zhou, Y.; Gonzales, E. C., *The Astrophysical Journal*, 915, 45, 2021.

25. A High–Contrast Search for Variability in HR 8799bc with VLT–SPHERE
Biller, B. A.; Apai, D.; Bonnefoy, M.; Desidera, S.; Gratton, R.; Kasper, M.; Kenworthy, M.; Lagrange, A.; Lazzoni, C.; Mesa, D.; Vigan, A.; **Vos, J. M.**; Wagner, K.; Zurlo, A., *Monthly Notices of the Royal Astronomical Society*, 503(1):743–767, 2021.

White Papers & Research Notes

26. The L/T Transition
Vos, J. M. et al., White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.

27. A Tool and Workflow for Radio Astronomical "Peeling" in CASA
Williams, P. K. G.; Allers, K. N.; Biller, B. A.; **Vos, J. M.**, *Research Notes of the American Astronomical Society*, 3, 110, 2019.

28. Mapping Ultracool Atmospheres: Time–domain Observations of Brown Dwarfs and Exoplanets
Apai, D. et al., incl **Vos, J. M.**, White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.

29. Brown Dwarfs and Directly Imaged Exoplanets in Young Associations
Faherty, J. et al., incl. **Vos, J. M.**, White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.

30. High–Resolution Spectroscopic Surveys of Ultracool Dwarf Stars & Brown Dwarfs
Burgasser, A. et al., incl. **Vos, J. M.**, White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.

31. Fundamental Physics with Brown Dwarfs: The Mass–Radius Relation
Burgasser, A. et al., incl. **Vos, J. M.**, White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.

32. IDEAS: Immersive Dome Experiences for Accelerating Science
Faherty, J. et al., incl. **Vos, J. M.**, White Paper for Decadal Survey on Astronomy and Astrophysics 2020 by the National Academy of Science, Engineering and Medicine, *Bulletins of the American Astronomical Society*, 2019.