Dr Johanna M. Vos

Postdoctoral Fellow
American Museum of Natural History
johannavos.github.io
jvos@amnh.org

Professional Appointments

Postdoctoral Fellow 2018–Present
Department of Astrophysics, American Museum of Natural History
Advisor: Dr Jacqueline K. Faherty

Education

Institute for Astronomy, University of Edinburgh 2014–2018
PhD in Astronomy
Thesis: "Characterising Weather and Rotation on Substellar Worlds"
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.I)

Grants & Awards

Hubble Space Telescope General Observer Grant, $102,000, **PI** 2021
NASA Keck Data Award, $15,500, **PI** 2021
TESS Cycle 3 Guest Investigator Small Program, $50,000, Co-I 2020
Hubble Space Telescope General Observer Grant, $171,000, **PI** 2019
TESS Cycle 2 Guest Investigator Small Program, $50,000, Co-I 2019
NASA Exoplanets Research Program (XRP), $400,000, Co-I 2019
Other Worlds Lab, UC Santa Cruz, *Heising-Simons Foundation*, $1,000 2019
Cool Stars 20 Conference Grant, *Boston University*, $500 2018
Winton Thesis Prize, *University of Edinburgh*, $1,400 2018
Principal's Go Abroad Fund, *University of Edinburgh*, $1,000 2018
Exoclipse Conference Grant, *Boise State University*, $2,000 2017
Principal's Career Development Scholarship, *U of Edinburgh*, $100,000 2014
First Class Book Prize, *Trinity College Dublin* 2011, 2012, 2013
Entrance Exhibition Scholarship, *Trinity College Dublin* 2010

Invited Talks and Seminars

Invited Colloquium, Carnegie Earth and Planets Laboratory 2022
Invited Colloquium, University of California, Santa Cruz 2021
Invited Colloquium, University of Texas at Austin 2021
Invited Colloquium, Center for Space and Habitability, University of Bern 2021
Invited Colloquium, Trinity College Dublin 2021
Invited Colloquium, Center for Computational Astrophysics, Flatiron Institute 2020
Invited Colloquium, NASA Goddard Space Flight Center 2020
Invited Talk, Brown Dwarf to Exoplanet Connection, University of Delaware 2019
Invited Colloquium, Dublin Institute for Advanced Studies 2019
Invited Colloquium, American Museum of Natural History 2019
Invited Colloquium, Royal Observatory of Edinburgh 2017
Invited Talk, European Southern Observatories, Santiago, Chile 2017

Conference Talks

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, NY 2021

	Contributed Talk, American Astronomical Society Meeting 237	2021
	Contributed Talk, Exo-Webb Seminar Series	2020
	Contributed Talk, American Astronomical Society Meeting 235, Honolulu, HI	2020
	Contributed Talk, Other Worlds Laboratory, UC Santa Cruz, CA	2019
	Dissertation Talk, American Astronomical Society Meeting 233, Seattle, WA	2019
	Contributed Talk, Gotham Fest 2019, New York, NY	2019
	Plenary Talk, Cool Stars 20, Boston, MA	2018
	Contributed Talk, Exoclipe, Boise, ID	2017
	Contributed Talk, Scottish Exoplanet and Brown Dwarf Meeting	2017

Selected Telescope Time

	NASA Keck/NIRSPEC, 0.5 nights **PI**	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
	Hubble Space Telescope (16 orbits) & Very Large Array (27.6 hr), **PI**	2019
	Gemini-S/IGRINS, 31 hr, **PI**	2020
	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

Teaching Experience

Research Advisor 2018–Present
Science Research Mentoring Program (SRMP), *American Museum of Natural History*
Research Experience for Undergraduates (REU), *National Science Foundation*
AstroCom NYC, *City University of New York*

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
Physics 1B Experimental Lab
Observational Astronomy Lab

Teaching Assistant, *University of Edinburgh* 2014–2018
Maths for Physics 1
Introductory Astrophysics

Research Advising

11 Undergraduate Students

Mohammad Refat (CUNY Baruch College)	2021–Present
Jose Adorno (CUNY Queens College, now at University of Miami)	2020–Present
Allison McCarthy (University of Alabama, now at Boston University)	2019–Present
+8 additional students as co-mentor	2019–Present

12 High–School Students

BL Cadet, Amelia Lobo-Jost & Omar Piron	2021–Present
Azul Ruiz Diaz, Jai Glazer & Sophia Ameneyro	2020–2021
Izzy Lapidus, Otis McCallum & William McCartney	2019–2020
Elko Gerville–Reache, Raunak Amanna, & Nima Brivanlou	2018–2019

Service

External reviewer for Swiss National Science Foundation	2020–Present
Telescope Time Allocation Committee member (Keck, TESS)	2019–Present
Journal Referee, *ApJ, ApJL, AJ*	2018–Present
Scientific Organizing Committee, Cloud Nine Con, U of Heidelberg	2021
Astrophysics Seminar Organizer, American Museum of Natural History	2018–2020
Astronomy Representative, Postgraduate Forum, U of Edinburgh	2017–2018

Selected Outreach Activities

Scientific Advisor and Speaker "About Us", Festival UK 2022	2021–2022
Speaker, Science Alliance, AMNH Youth Initiatives	2021
Question Moderator, AMNH Astronomy Online Programs	2020–2021
Speaker, STEM to SHTEM Internship Program, Stanford University	2020
Featured Scientist, Million STEM	2020
Speaker, Harlem Academy High School	2020
Speaker, Westport Astronomical Society	2019
Speaker, BridgeUP: STEM Internship Program	2019
Speaker, Royal Observatory of Edinburgh Winter Talk Series	2018
Speaker, Pint of Science Festival, Edinburgh UK	2017
Contributor, Edinburgh University Sci Magazine & Women are Boring	2017–2018
Speaker, Loreto College Dublin	2016
Speaker, Royal Observatory of Edinburgh Open Day	2016
Workshop leader, University of Edinburgh Kickstart Program	2015–2016
Speaker, Women in Physics Event, Preston Lodge High School, Edinburgh	2015
Event Assistant, Edinburgh International Science Festival	2015
STEM Ambassador, StemEast	2014–2018
Mentor, Transition Year Physics Experience Program, Trinity College Dublin	2012

Selected Media/Press

California Academy of Sciences Universe Update	2022
NASA Jet Propulsion Laboratory Press Release	2022
AAS 239 Winter Meeting Press Conference	2022
Irish Times Research Lives Interview	2020
NRAO's 2020 Astronomy Highlights with Phil Plait	2020
Space.com Science & Astronomy Interview	2020
NASA Jet Propulsion Laboratory Press Release	2020
New Scientist Space Research Highlights	2015
Science Magazine Research Spotlight	2015

First Author Publications

* denotes equal author contribution

1. 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.
2. 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.
3. 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.

4. 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.

5. 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.

6. 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

7. 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.

8. 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.

9. 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

10. 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., submitted to *The Astrophysical Journal*, January 2022.

11. Binaries or Variables? Disentangling the Signatures of L/T Transition Blended-Light Atmospheres
Ashraf, A.; Bardalez Gagliuffi, D.; Manjavacas, E.; **Vos, J. M.**; Faherty, J. K., submitted to *The Astrophysical Journal*, November 2021.

12. 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.

13. 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.

14. 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.

15. 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.

Selected White Papers & Research Notes

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.