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 Winner

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, **PI**	2021
TESS Cycle 3 Guest Investigator Small Program, Co-I	2020
Hubble Space Telescope General Observer Grant, **PI**	2019
TESS Cycle 2 Guest Investigator Small Program, Co-I	2019
NASA Exoplanets Research Program (XRP), Co-I	2019
Other Worlds Lab, UC Santa Cruz, *Heising-Simons Foundation*	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 Scholarship, *University of Edinburgh*	2014

Invited Talks and Seminars

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, 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
Plenary Talk, Cool Stars 20, Boston, MA	2018

	Contributed Talk, Exoclipe, Boise, ID	2017
	Contributed Talk, Scottish Exoplanet and Brown Dwarf Meeting	2017
Workshops Attended	Tackling the Complexities of Substellar Objects, *Lorentz Centre, Leiden*	2020
	Other Worlds Laboratory, *University of California Santa Cruz*	2019
	Multi-Dimensional Characterization of Distant Worlds, *U of Michigan*	2019
Selected Telescope Time	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 Program, *City University of New York*	
	Guest Lecturer	2021
	Peering into Darkness – Stanford University	
	Instructor	2019–2020
	Designed and delivered "Stars" course for After School Program, AMNH	
	Head Teaching Assistant	2016–2018
	Physics 1B Experimental Lab, University of Edinburgh	
	Observational Astronomy Lab, University of Edinburgh	
	Teaching Assistant	2014–2018
	Maths for Physics 1, University of Edinburgh	
	Introductory Astrophysics, University of Edinburgh	
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)	2019–2020
	+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	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

Speaker and Role Model, "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

Irish Times Research Lives Interview	2020
NRAO's 2020 Astronomy Highlights with Phil Plait	2020
Space.com Science & Astronomy Interview	2020
NASA/JPL 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. submitted to *The Astrophysical Journal*
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.

Co–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. 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, accepted for publication in *The Astrophysical Journal*.

9. 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, accepted for publication in *The Astronomical Journal*.

10. 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.

11. 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.

12. 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.

13. 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.

Selected White Papers & Research Notes

14. The L/T Transition
Vos, J. M.; Allers, K.; Apai, D.; Biller, B.; Burgasser, A. J.; Faherty, J.; Gagne, J.; Helling, C.; Morley, C.; Radigan, J.; Showman, A.; Tan, .; Tremblin, P., 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.

15. 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.

16. Mapping Ultracool Atmospheres: Time–domain Observations of Brown Dwarfs and Exoplanets
Apai, D.; Biller, B.; Burgasser, A.; Girard, J. H.; Gizis, J. E.; Karalidi, T.; Kraus, Ad. L.; Lew, B. W. P.; Manjavacas, E.; Marley, M.; Miles–Paez, P. A.; Morley, C. V.; Radigan, J.; **Vos, J. M.**; Zhou, Y., 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. Brown Dwarfs and Directly Imaged Exoplanets in Young Associations
Faherty, J.; Allers, Katelyn; Bardalez Gagliuffi, D.; Burgasser, A. J.; Gagne, J.; Gizis, J.; Kirkpatrick, J. D.; Riedel, A.; Schneider, A.; **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.

18. High–Resolution Spectroscopic Surveys of Ultracool Dwarf Stars & Brown Dwarfs
Burgasser, A.; Apai, D.; Bardalez–Gagliuffi, D.; Blake, C.; Gagne, J.; Konopacky, Q.; Martin, E.; Metchev, S.; Plavchan, P;, Reiners, A.; Schlawin, E.; Sousa–Silva, C.; **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. Fundamental Physics with Brown Dwarfs: The Mass–Radius Relation
Burgasser, A.; Baraffe, I.; Browning, M.; Burrows, A.; Chabrier, G.; Creech–Eakman, M.; Demory, B.; Dieterich, S.; Faherty, J.; Huber, D.; Lodieu, N.; Plavchan, P.; Michael Rich, R.; Saumon, D.; Stassun, K.; Triaud, A.; van Belle, G.; van Grootel, V.; **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.