Dr Johanna M. Vos

Postdoctoral Fellow
American Museum of Natural History
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Education and Training

Institute for Astronomy, University of Edinburgh, UK — 2014-2018
PhD in Astronomy
Thesis: "Characterising Weather and Rotation on Substellar Worlds"
Advisor: Dr Beth A. Biller

Trinity College Dublin, Ireland — 2010-2014
BA (Mod) Physics with Astrophysics
Graduated with First Class Honours

Professional Appointments

American Museum of Natural History — 2018 – Present
Postdoctoral Fellow

Research Support Grants & Awards

Hubble Space Telescope General Observer Grant, *STSci,* **$171,300** — 2019
Cool Stars Travel Grant, **$500** — 2018
Principal's Go Abroad Fund, *University of Edinburgh,* **$645** — 2018
Exoclipse Travel Grant, **$1100** — 2017
Principal's Career Development Scholarship, *University of Edinburgh,* **$130,000** — 2014
First-Class Book Prize, *Trinity College Dublin,* **$550** — 2011, 2012, 2013

Selected Telescope Time

A case study for JWST: Disentangling auroral and cloud variability in early L dwarfs — 2019
Hubble Space Telescope (16 orbits) & Very Large Array (27.6 hr), ***PI****.*

Mapping Atmospheric Structures in Brown Dwarfs in early L dwarfs — 2019
Gemini/IGRINS, 20.2 hr, ***PI****.*

Spatial Cloud Map of a Planetary-Mass Companion — 2019
Spitzer Space Telescope Director's Discretionary Time, 33.1 hr, ***PI****.*

Weather and Rotation of Young Brown Dwarfs — 2018
Spitzer Space Telescope Medium Program, 70 hr, ***PI***

Rotational Velocities of Exoplanet Analogs — 2016-2018
NASA Gemini/GNIRS and IRTF/iSHELL program, 10 nights, ***PI***

Wind Speeds on Extrasolar Worlds — 2016-2018
Spitzer Space Telescope (30.8 hr) & Very Large Array (33 hr), Co-I

Exometeorology: Characterising Weather on a Young, Free-Floating Planet — 2016
Hubble Space Telescope (5 orbits) & Spitzer Space Telescope (17.6 hr), Co-I

The First Search for Exoplanet Weather — 2014-2017
ESO New Technology Telescope, 29 nights, ***PI***

Selected Invited / Conference Talks

Characterising Cool Atmospheres with Variability Monitoring 2020
Seminar, NASA/Goddard Space Flight Center, MD, USA

Young L Dwarf Variability in the Mid-IR 2020
Contributed talk, American Astronomical Society Meeting 233, Seattle, WA, USA

Probing the Turbulent Atmospheres of Young Giant Planet Analogs 2019
Invited Talk, BDEXOCON, University of Delaware, USA

Weather and Rotation on Substellar Worlds 2019
Seminar, Dublin Institute for Advanced Studies, Ireland

Detecting Weather Patterns on Low-Gravity Brown Dwarfs 2019
Dissertation Talk, American Astronomical Society Meeting 233, Seattle, WA, USA

Weather Patterns on Exoplanet Analogs 2018
Plenary Talk, Cool Stars 20, Boston, MA, USA

The Viewing Angle of Exoplanet Analogues Influences Their Observed Colours and Amplitudes 2017
Contributed Talk, Exoclipe, Boise, ID, USA

Testing the Effect of Viewing Angle on the Observed Properties of Brown Dwarfs and Exoplanet Analogues 2017
Contributed Talk, Scottish Exoplanet and Brown Dwarf Meeting, University of Edinburgh, UK

The First Search for Weather Patterns on Exoplanet Analogues 2017
Invited Talk, European Southern Observatories, Santiago, Chile

Teaching & Mentoring

NSF Research Experiences for Undergraduates (REU), AMNH 2019
Advised: Allison McCarthy (University of Alabama)
Co-advised: Afra Ashraf (Barnard College) and Claire Mechman (Lehman College)

Science Research Mentoring Program, AMNH 2019-Present
Research mentor for three high-school students each year

After School Program, AMNH 2019-Present
Astronomy Instructor

University of Edinburgh 2014-2018
Head Teaching Assistant
Maths for Physics, Introductory Astrophysics, Physics Experimental Lab, Observational Astronomy Lab

Selected Outreach Activities

Westport Astronomical Society 2019
Speaker, "The Brown Dwarf - Exoplanet Connection"

BridgeUP: STEM 2019
Speaker, "Weather and Rotation on Extrasolar Worlds"

StemEast, UK & Ireland 2014-2018
STEM Ambassador

Royal Observatory of Edinburgh Winter Talk Series 2018
Speaker, "The Exoplanet - Brown Dwarf Connection"

Women are Boring 2018

Contributor, "Searching for Weather Patterns on Free-Floating Worlds"

Pint of Science Festival 2017
Speaker, "Whatever the Weather"

Edinburgh University Science Magazine 2017
Contributor, "Fingerprints From the Birth of the Universe"

Kickstart Summer Programme 2015-2016
Workshop Leader

Refereed Publications

1. Allers, K. N.; **Vos, J. M.**; Biller, B. A.; Williams, P. K.G. *"The First Measurement of Windspeed on a Brown Dwarf."* under review, Science, 2019.
2. **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. *"Spitzer Variability Properties of Young Giant Planet Analogs"* in prep.
3. **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. *"A Search for Variability in Exoplanet Analogues and Low-Gravity Brown Dwarfs."* Monthly Notices of the Royal Astronomical Society, 483:480-502, 2019.
4. **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. *"Variability of the lowest mass objects in the AB Doradus moving group."* Monthly Notices of the Royal Astronomical Society, 474(1):10411053, 2018.
5. 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. *"Simultaneous Multiwavelength Variability Characterization of the Free-floating Planetary-mass Object PSO J318.5–22." The Astronomical Journal*, 155(2):95, 2018.
6. **Vos, J. M.**; Allers, K. N.; Biller, B. A. *"The Viewing Geometry of Brown Dwarfs Influences Their Observed Colors and Variability Amplitudes."* The Astrophysical Journal, 842(2):78, 2017.
7. 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. *"Variability in a young, L/T transition planetary-mass object."* Astrophysical Journal Letters, 813(2):16, 2015.

Selected White Papers & Research Notes

1. **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. *"Astro2020 Science White Paper: The L/T Transition"*, Bulletins of the American Astronomical Society, 2019.
2. Williams, P. K. G.; Allers, K. N.; Biller, B. A.; **Vos, J. M.** *"A Tool and Workflow for Radio Astronomical Peeling in CASA"* Research Notes of the American Astronomical Society, 3, 110, 2019.

3. Apai, Daniel; Biller, Beth; Burgasser, Adam; Girard, Julien H.; Gizis, John E.; Karalidi, Theodora; Kraus, Adam L.; Lew, Ben W. P.; Manjavacas, Elena; Marley, Mark; Miles-Paez, Paulo A.; Morley, Caroline V.; Radigan, Jacqueline; **Vos, Johanna M.**; Zhou, Yifan. *"Astro2020 Science White Paper: Mapping Ultracool Atmospheres: Time-domain Observations of Brown Dwarfs and Exoplanets"*, 2019.

4. Faherty, Jacqueline; Allers, Katelyn; Bardalez Gagliuffi, Daniella; Burgasser, Adam J.; Gagne, Jonathan; Gizis, John; Kirkpatrick, J. Davy; Riedel, Adric; Schneider, Adam; **Vos, Johanna M.** *"Astro2020 Science White Paper: Brown Dwarfs and Directly Imaged Exoplanets in Young Associations"*, 2019.