Sierra L. Grant, Ph.D.

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Employment

Carnegie Institution for Science | Earth and Planets Laboratory **09/2024–Present**
Carnegie Postdoctoral Fellow
Supervisor: Dr. Alycia Weinberger

Max Planck Institute for Extraterrestrial Physics **09/2021–09/2024**
Postdoctoral Researcher
Supervisor: Prof. Ewine F. van Dishoeck

Education

Boston University **05/2017–08/2021**
Ph.D.
Advisor: Prof. Catherine C. Espaillat
"Protoplanetary Disk Evolution: From Inner Disk Accretion to Outer Disk Dust Evolution"

Boston University **09/2015–05/2017**
M.A.

University of Michigan **09/2011–05/2015**
B.S. Astronomy & Astrophysics and B.S. Interdisciplinary Physics

Research Interests

I study protoplanetary disks: the disks of gas and dust around young stars that are the birthplaces of exoplanets. Specifically, I focus on the inner disk chemistry and structure and how populations of disks evolve. I use observations from space-based (including JWST, *Spitzer*, and *Herschel*) and ground-based telescopes (including the VLT, Lowell Discovery Telescope, Gemini South, NASA's IRTF, ALMA, and NOEMA), to characterize these disks and their evolution. Recently, I have been extending this work down disks around planetary-mass companions.

Accepted Observing Proposals

As PI or Co-PI:

- JWST-MIRI:
  - 67 hours in Cycle 4 from two programs as Co-PI (PIDs 7538 and 7792)
  - 41.5 hours in Cycle 2 (PID 3886)
- ALMA (13.4 hours in Cycle 12, 15.4 hours in Cycle 11, 4.2 hours in Cycle 7)
- VLT-CRIRES+ (20.3 hours in P112, 17.1 hours in P111)
- NOEMA (18 hours, ranked "A", Co-PI)
- Gemini South Observatory (17 hours in 2020A, 7.7 hours in 2020B)
- NASA Infrared Telescope Facility (3 half-nights each in 2019B and 2020A)
- Lowell Discovery Telescope, Lowell Observatory (10 half-nights)

As Co-I:

- JWST-MIRI (24.5 hours in Cycle 4)
- JWST-NIRSpec (5.6 hours in Cycle 2)
- VLT-CRIRES+ (41 hours in P110, 25 hours in P111)
- ALMA (various programs across multiple cycles)
- *Hubble Space Telescope* (6 orbits) & *Chandra X-ray Observatory* (35ks) & VLA (9.6 hours)
- *Spitzer Space Telescope* (Proposal ID #12036)

Talks and Presentations, **including planned, * indicates invited talk**

07/2026*	Discs on the Exe
03/2026*	University of Florida Astronomy Colloquium
02/2026*	Carnegie Observatories Colloquium
01/2026*	Joint NRAO/UVA Colloquium
11/2025*	ExoELT: Planetary Formation and Exoplanets in the ELT Era
11/2025*	University of Maryland Astronomy Colloquium
06/2025*	Gordon Conference on the Origins of Solar Systems
05/2025*	"Planets on the Edge" Kavli Institute for Theoretical Physics conference
03/2025*	University of Rochester Astro Colloquium
02/2025*	Celebrating 3 Years of JWST Observations of Planet-Forming Disks
10/2024	JWST MIRI Science Conference
09/2024*	Earth & Planets Laboratory General Seminar
06/2024*	GRAVITY+: impact on star and planet formation
04/2024*	Harvard Radcliffe Institute, Next in Science: James Webb Space Telescope
03/2024*	From Star to Planet Formation, Villa Vigoni
02/2024*	Celebrating 30 Years of Protoplanetary Disk Chemistry: past, present, and future
09/2023	The First Year of JWST Science Conference
01/2023*	MPE Center for Astrochemical Studies Seminar
10/2022*	Observing the Universe in Motion: 5 Years of GRAVITY
09/2022*	The Inner Regions of Protoplanetary Disks
05/2022*	Center for Astrophysics SMA Seminar
05/2022	MPE IR Group Tea Talk
05/2022*	ESO Star and Planet Formation Seminar
02/2022	An Infrared Bright Future for Ground-based IR Observatories in the Era of JWST
03/2021	Caltech Tea Talk
12/2020	Five years after HL Tau: a new era in planet formation
12/2018*	UMass Amherst Star and Planet Formation Lunch Talk
07/2018	Cool Stars 20 (Poster)
01/2018	The 4th MA-CT Regional Star Formation Meeting
12/2017	Boston Area Exoplanet Science Meeting
01/2017	Regional Star Formation Meeting
06/2015*	Frontiers in Star Formation: Celebrating Contributions to the Field by Nuria Calvet and Lee Hartmann
01/2015	225th American Astronomical Society Meeting (Poster)
02/2014	Scientista Symposium, Massachusetts Institute of Technology (Poster)

Honors, Awards, and Funding

2025	JWST Cycle 4 GO Awards (PIDs 7538, 7792, 7890), Co-PI and US Admin PI, $516,000
2023	French national space agency (CNES) funding grant, Co-grant PI, $130,000
2023	JWST Cycle 2 GO Awards (PID 3886), PI, $126,000
2020	ALMA Student Observing Support, $33,000
Fall 2015	Boston University Dean's Fellowship
Fall 2011, 2013, & Spring 2014	University of Michigan University Honors

Selected Press and Media

01/2026	Scientific American, JWST Spots Swirling Cradle for Exomoons
12/2025	SETI Live Podcast & Interview, Baby Moons in the Making?
09/2025	Universe Today, The JWST Spies The Raw Materials For Exomoons
09/2025	USA Today, NASA's Webb telescope gets a never-before-seen look at how moons form on exoplanets
09/2025	NASA, NASA's Webb Telescope Studies Moon-Forming Disk Around Massive Planet
06/2024	NASA, Webb Finds Plethora of Carbon Molecules Around Young Star
02/2024	Scientific American, JWST Is Tracking Down the Cosmic Origins of Earth's Water
09/2023	Nature, How worlds are born: JWST reveals exotic chemistry of planetary nurseries
04/2023	MPE, JWST peeks into the birthplaces of exoplanets
03/2014	NOAO, A Month of Personal Transformation at Kitt Peak

Publications

First-Author: The list can be accessed here.

9. *"A carbon-rich disk surrounding a planetary-mass companion"*
   Gabriele Cugno & **Sierra L. Grant** (joint first authors)
   Cugno & Grant 2025, ApJ, 991L, 46C, ApJ Letters
8. *"MINDS. A transition from H_2O to C_2H_2 dominated spectra with decreasing stellar luminosity"*
   Sierra L. Grant, Milou Temmink, Ewine van Dishoeck, and 19 others.
   Grant et al. 2025, A&A, 702A,126G
7. *"MINDS. A multi-instrument investigation into the molecule-rich JWST-MIRI spectrum of the DF Tau binary system"*
   Sierra L. Grant, Nicolas Kurtovic, Ewine van Dishoeck, and 26 others
   Grant et al. 2024b, A&A, 689A, 85G
6. *"Full L- and M-band high resolution spectroscopy of the S CrA binary disks with VLT-CRIRES+"*
   Sierra L. Grant, Giulio Bettoni, Andrea Banzatti, Ewine van Dishoeck, and 6 others
   Grant et al. 2024a, A&A, 684A, 213G
5. *"The $\dot{M}$–M_{disk} relationship for Herbig Ae/Be stars: a lifetime problem for disks with low masses?"*
   Sierra L. Grant, Lucas M. Stapper, Michiel R. Hogerheijde, Ewine F. van Dishoeck, Sean Brittain, and Miguel Vioque
   Grant et al. 2023b, AJ, 166, 147G
4. *"MINDS. The detection of $^{13}CO_2$ with JWST-MIRI indicates abundant CO_2 in a protoplanetary disk"*

Sierra L. Grant, Ewine F. van Dishoeck and 44 others
Grant et al. 2023a, ApJ, 947L, 6G, ApJ Letters

3. *"Accretion Properties in Herbig Ae/Be Stars as Traced by the Brγ Line"*
Sierra L. Grant, Catherine C. Espaillat, Sean Brittain, Caleb Scott-Joseph, and Nuria Calvet
Grant et al. 2022, ApJ, 926, 229G

2. *"An ALMA Survey of Protoplanetary Disks in Lynds 1641"*
Sierra L. Grant, Catherine C. Espaillat, John Wendeborn, and 8 others
Grant et al. 2021, ApJ, 913, 123

1. *"Herschel Observations of Protoplanetary Disks in Lynds 1641"*
Sierra L. Grant, Catherine C. Espaillat, S. Thomas Megeath, Nuria Calvet, and 6 others
Grant et al. 2018, ApJ, 863, 13

Co-Author: **The list of 50+ manuscripts can be accessed here.**

Leadership and Service

– Elected Representative for the Carnegie Institution Postdoctoral Association (01/2025 – 01/2026)
– Women as Leaders in Astronomy Organizer (09/2018 – 08/2021)
– Graduate Student Representative (09/2018 – 08/2019)
– JWST Time Allocation Committee
– Panel member/reviewer for NSF and ERC grants
– Referee for AAS and A&A Journals

Affiliations and Outreach

01/2026 – present	Full AAS Member
11/2021 – 09/2024	Planet Formation Witnesses and Probes: Transition Disks Research Unit
09/2015 – 08/2021	Women as Leaders in Astronomy (Boston University)
09/2015 – 08/2021	Boston University Astronomy Public Open Nights
09/2018 – 05/2019	Letters to a Pre-Scientist Pen Pal
09/2011 – 05/2015	Student Astronomical Society
09/2011 – 05/2012	Douglass Houghton Scholars Program
09/2011 – 05/2012	Women in Science and Engineering Residency Program
06/2010	Michigan Technological University Women in Engineering Program

Teaching

Spring 2016	AS 203: Principles of Astronomy II Teaching Assistant