# Dr. Dominic Oddo

Graduate Research Assistant | Albuquerque, NM, USA

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## Education

**Ph.D. Physics w/ Astrophysics Conc., University of New Mexico** July 2026
Dissertation: *An Investigation of TESS M&Ms anmd the Occurrence Rate of Transiting Circumbinary Planets*
Advisor: Dr. Diana Dragomir

**B.S. Physics, Case Western Reserve Univesity** May 2020
*Secondary Major in Astronomy*
Thesis: *Defining a Path to an Optimized Exoplanet Detection Survey for Asymmetric Wide-Aperture Telescopes*
Advisor: Dr. Ben Monreal

## Research Interests

- Exoplanet detection, characterization, and demographics in binary systems
- Stellar characterization of eclipsing binary stars
- Planetary system architectures & formation and evolution processes

## Research Experience

***Current Research - NASA FINESST Future Investigator** Sept 2023 — Sept 2026

– Finding the occurrence rate of circumbinary planets (CBPs) with TESS
  – Building single-transit search and vetting methods in TESS light curves
  – Calculating occurrence rates through pipeline sensitivity and detection probability analysis
– Defining a catalog of M&M eclipsing binaries with TESS
  – Finding physical properties of stars in binaries from photometric/SED fitting.
  – Calculating statistical properties such as circularization period, mass ratio distribution.

**University of New Mexico - Research Assistant** Fall 2020 — Spring 2023

– Radial velocity follow-up of a multi-planet TESS Object of Interest (TOI) with gap between planets
  – Most multis are dynamically packed, but this TOI is not, according to TESS observations
  – CFHT SPIRou instrument awarded time for RV characterization
– Characterization small planets from TESS with CHEOPS observations
  – Combined NASA TESS and ESA CHEOPS observations of five systems
  – Jointly fitted transit models to light curves to obtain precise orbital and physical parameters

**Case Western Reserve University - Research Assistant** Fall 2019 — Summer 2020

Optimization of direct-imaging survey strategies for max exoplanet yield with Dr. Benjamin Monreal. I developed completeness calculations for terrestrial planets orbiting various stellar types; I completed time-optimization calculations for max first-observation yield

**Rochester Institute of Technology - NSF REU** Summer 2018

Earth-like exoplanet yield for space-based LUVOIR mission with Dr. Don Figer. I calculated observing completeness for the set of nearby stars using Monte Carlo techniques; I calculated metrics such as SNR and required exposure time to resolve targets

## Awards & Observing

**NASA FINESST Graduate Research Grant** September 2023 — September 2026

**Approved Observing Proposals**

PI for CFHT-SPIRou spectropolarimeter Mauna Kea, HI

- 2021B: 30 hrs for "A deeper look at the architecture of multi-planet systems" (21BC06)
- 2022B: 25 hrs for "Determining the masses of a dense inner planet and sub-Neptunian outer planet (22BC10+22BC97)

CHEOPS proposal, Co-I, "Exploring the Diversity of Small Planet Compositions", Cycles 2 & 3

## Publications

**Oddo, Dominic, Diana Dragomir, Brian P. Powell, et al. (Jan. 2026). "A Catalog of M&M Eclipsing Binaries with TESS". In: 996.1, 82, p. 82. DOI: 10.3847/1538-4357/ae0c0f. arXiv: 2508.13941 [astro-ph.SR].**

Meech, Annabella et al. (May 2026). "JWST COMPASS: A NIRSpec G395H Transmission Spectrum of Radius Valley Dweller TOI-260 b". In: 171.5, 274, p. 274. DOI: 10.3847/1538-3881/ae472f. arXiv: 2602.22329 [astro-ph.EP].

Essack, Zahra et al. (July 2025). "Giant Outer Transiting Exoplanet Mass (GOT 'EM) Survey. VI. Confirmation of a Long-period Giant Planet Discovered with a Single TESS Transit". In: *AJ* 170.1, 41, p. 41. DOI: 10.3847/1538-3881/add88b. arXiv: 2506.20019 [astro-ph.EP].

Nies, Molly et al. (Nov. 2024). "HD 21520 b: a warm sub-Neptune transiting a bright G dwarf". In: *MNRAS* 534.4, pp. 3744–3760. DOI: 10.1093/mnras/stae2079. arXiv: 2406.09595 [astro-ph.EP].

**Oddo, Dominic, Diana Dragomir, Alexis Brandeker, et al. (Mar. 2023). "Characterization of a Set of Small Planets with TESS and CHEOPS and an Analysis of Photometric Performance". In: *AJ* 165.3, 134, p. 134. DOI: 10.3847/1538-3881/acb4e3. arXiv: 2301.08162 [astro-ph.EP].**

Barragán, O. et al. (Aug. 2022). "The young HD 73583 (TOI-560) planetary system: two 10-$M_\oplus$ mini-Neptunes transiting a 500-Myr-old, bright, and active K dwarf". In: *MNRAS* 514.2, pp. 1606–1627. DOI: 10.1093/mnras/stac638. arXiv: 2110.13069 [astro-ph.EP].

Monreal, Benjamin et al. (Sept. 2019). "WAET: low-cost ground based telescopes for accelerated exoplanet direct imaging". In: *Bulletin of the American Astronomical Society*. Vol. 51, 76, p. 76. DOI: 10.48550/arXiv.1907.04897. arXiv: 1907.04897 [astro-ph.IM].

## Selected Scientific Presentations

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| **Contributed talk** | Circumbinary planets with ESA, Madrid, ES | Dec. 2025 |
| **Contributed talk** | From Transits to Trends Workshop, Albuquerque, NM | Aug. 2025 |
| **Contributed talk** | Binary stars in the space era, Keele, UK | Jul. 2025 |
| **Invited talk** | Warwick University Astronomy Seminar, Warwick, UK | Jun. 2025 |
| **Poster** | Know Thy Stars II, Pasadena, CA | Feb. 2025 |
| **Contributed talk** | CBPs across the HR diagram Workshop, Firenze, IT | Jan. 2025 |

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| **Poster** | TESS Science Conference III, Cambridge, MA | Aug. 2024 |
| **Poster** | Exoplanets V Conference, Leiden, NL | Jun. 2024 |
| **Invited outreach talk** | The ABQ Astronomical Society, Albuquerque, NM | Feb. 2024 |
| **Contributed talk** | AAS 243 Winter Meeting, New Orleans, LA | Jan. 2024 |
| **Invited ECR talk** | EXOPAG 29, New Orleans, LA | Jan. 2024 |
| **Invited talk** | Boston University Center for Space Physics, Boston, MA | Mar. 2023 |
| **Invited talk** | TESS Seminar, MIT, Cambridge, MA | Mar. 2023 |
| **Contributed talk** | TESS Science Conference II (virtual) | Aug. 2021 |
| **Poster** | AAS 233 Winter Meeting, Seattle, WA | Jan. 2019 |

## Professional

**Local Organizing Committee - Transits to Trends Workshop** Albuquerque, NM, 2025

- **Participant**: *Chaired session, sat on panel, presented research
- **LOC**: Contributed to workshop website, abstract booklet, designed badges, ran technical support

**Undergraduate Teaching Experience** Albuquerque, NM, 2020 — 2022

- **Observatory lab for majors**: Taught students fundamental astronomy and scientific method and practice, how to use the telescope and take their own data, and develop and execute their own projects. Graded all assignments.
- **Online astronomy lab**: Taught students fundamental astronomy concepts and scientific method and practice, including sig figs, measurements, and practice with large numbers. Graded all assignments.

**Sagan Exoplanet Summer Workshop: Exoplanet Science in the Gaia Era** Pasandena, CA, Summer 2022

- Workshop detailing the effective use of Gaia data in exoplanet science.
- Learned essential skills in astrometric data analysis.

**UNM Campus Observatory Operator** Albuquerque, NM, 2021 - present

- Volunteering at public observing nights on Friday evenings, with hands-on experience at the scope
- Taught one undergraduate course at the observatory

**AAS Astronomy Ambassador Program, AAS 239th Meeting** Salt Lake City, UT (virtual), Jan. 2022

- Workshop for early-career astronomers interested in public engagement.
- Learned effective outreach strategies and discussed with colleagues.

**TESS Planet Candidate Vetting** TESS Science Office (virtual)

- Examining light curves from TESS data pipeline outputs to determine outcome

**Women in Physics and Astronomy Club, executive member** Case Western Reserve University, Cleveland, OH, 2018 – 2020

## Technical Skills

- **Languages**: Python (primary), Matlab, C, Fortran, SQL
- **Tools and packages**: `eleanor`, `tglc`, `lightkurve`, `astroquery`, `SEDFit`, `wotan`, `REBOUND`, `scikit-learn`, and many more
- **Computing**: HPC (including SLURM, PBS, MPI), git, Jupyter

## Involvement and Leadership

### University of New Mexico

**United Graduate Workers of UNM**

– Organized colleagues for union recognition and first contract — Fall 2020 — Fall 2022

– Organized colleagues towards the largest wage increase for GAs, TAs, and RAs at UNM in decades and other benefits, including essential International Worker Rights article

– Elected leadership roles
  – Chief Steward, College of Arts & Sciences — Fall 2021 — Spring 2023
  – * Co-lead negotiator during contract bargaining — Spring 2024
  – Director of Organizing — September 2024 — September 2025
  – Chief Steward, College of Arts & Sciences — September 2025 — present

**Physics & Astronomy Graduate Student Association**

– Communications Officer — 2021 — 2022
  – Responsible for creating content to disseminate to fellow graduate students
  – Upkeep of website, monthly newsletter, social media, and event announcements

– UNM GPSA Council Representative — 2020 — 2021
  – Served as rep. to campus-wide Graduate and Professional Student Association Council
  – Advocated for grad students to receive COVID-19 relief funding from UNM

### Case Western Reserve University

**Residence Life, residential assistant** — 2017 — 2020

Fostered development of floors of 35 first-year students for three consecutive years; Promoted resident well-being through community-building strategies; Organized and promoted floor-specific programming to engage with Cleveland community

**CWRU Feminist Collective, secretary** — 2018 — 2020

Advocated for gender equity and inclusion; Organized and promoted events on campus; Recorded general body meeting minutes

**Varsity Track and Field, athlete, co-captain** — 2016 — 2020

Provided leadership and organization as team captain during junior and senior years

## External Organizations

**Know Your Neighbors CWRU, co-founder** 2019 — 2021

- Co-founded group of Cleveland community residents and CWRU students dedicated to bridging the divide between CWRU campus community and local neighborhoods
- Developed events both virtually and in-person to bring students and residents together
- Advocated university to include local resident perspective in decision-making

**Right to Health Action, Regional Organizer** 2020 — 2022

- Grassroots organization of thousands of activists nationwide working to end the COVID-19 pandemic and prevent future ones from ever occurring
- Regional organizer duties include building state teams in the Southwest and providing training and support to State Captains and state teams