Michael L. Palumbo III

Flatiron Research Fellow ◇ Flatiron Institute, 162 Fifth Avenue, New York, NY 10010
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SciX ◇ GitHub ◇ ORCiD

Education

Ph.D., Pennsylvania State University August 2018 – August 2024
Astronomy & Astrophysics and Astrobiology
Thesis: Characterizing Variability in Stellar Convective Velocity Fields Toward Enabling 10 cm/s Radial-Velocity Precision

M.Sc., Pennsylvania State University August 2018 – December 2020
Astronomy & Astrophysics

University of North Carolina at Chapel Hill August 2014 – May 2018
B.Sc. in Physics, Astrophysics Option *with Distinction and Highest Honors*
B.A. in Classics, Latin Option

Academic Appointments

Flatiron Research Fellowship September 2024 – Present
Flatiron Institute – Center for Computational Astrophysics

Graduate Research Assistant and Fellow January 2019 – May 2024
Pennsylvania State University
Supervisor: Prof. Eric Ford

Undergraduate Research Assistant June 2016 – July 2018
University of North Carolina at Chapel Hill
Supervisor: Prof. Sheila Kannappan

Summer Research Student June 2017 – August 2017
Center for Astrophysics | Harvard & Smithsonian
Supervisors: Prof. Raphaëlle Haywood and Dr. Steve Saar

Grants, Funding, & Fellowships

Grants

NASA Extreme Precision Radial Velocity Foundation Science October 2023
New Strategies for Combining EPRV Observations from Multiple Instruments
Role: Graduate Student (PI: Prof. Eric Ford)

NASA Extreme Precision Radial Velocity Foundation Science July 2021
Evaluating Stellar Variability Mitigation Strategies Using NEID Sun-as-a-Star Observations
Role: Collaborator (PI: Prof. Eric Ford)

Fellowships

Astronomy & Astrophysics Postdoctoral Fellowship 2024 Cycle *(Declined)*
National Science Foundation - $330,000

Pennsylvania Space Grant Graduate Fellowship August 2023 – May 2024
Pennsylvania Space Grant Consortium

Academic Computing Fellowship August 2020 – July 2023
Pennsylvania State University & The Eberly College of Science

Paul M. Doty Distinguished Graduate Fellowship August 2018 – August 2019
Pennsylvania State University & The Eberly College of Science

Other Funding

Rodger Doxsey Travel Prize January 2024
American Astronomical Society

North Carolina Space Grant Undergrad. Research Scholarship August 2017 – May 2018
North Carolina Space Grant Consortium

Teaching and Outreach

Instruction

Upward Bound Math and Science Summer 2020
Astronomy: The Search for Exoplanets and Life Beyond Earth

- Exoplanets and their Characteristics
- Gravitational Interactions and Orbital Resonances
- Stellar Spectroscopy
- The Outer Solar System

Guest Lectures

- PSU ASTRO 401, *Stellar Spectroscopy* for Prof. Chris Palma — December 5, 2019
- PSU ASTRO 497, *Life in the Universe: SETI* for Prof. Suvrath Mahadevan — March 17, 2020
- PSU ASTRO 497, *Saturn and its Rings* for Prof. Suvrath Mahadevan — March 24, 2020
- PSU ASTRO 497, *The Moons of Saturn* for Prof. Suvrath Mahadevan — March 31, 2020

Public Presentations

- Astronomy on Tap - State College, *A Spooky Tour of NASA's Galaxy of Horrors* — October 25, 2022

Student Mentorship

Elizabeth Gonzalez Fall 2023 – Present
Ph.D. Student, Pennsylvania State University
As part of her Ph.D. thesis, Elizabeth is leading the augmentation of my `GRASS` code to analyze convective blueshift variations during eclipses of the Sun observed by NEID.

Savannah Ruginski June 2025 – May 2026
REU Student, Center for Astrophysics | Harvard & Smithsonian
For her summer REU and her undergraduate honors thesis at Wheaton College, Savannah investigated the RV impact of active region moat flows using data from SDO.

Niamh O'Sullivan January 2026 – May 2026
CCA Predoctoral Student
As a predoctoral intern at the CCA, Niamh used solar spectral models and data from HARPS-N to search for chromatic trends in supergranulation-driven variability.

Service to the Profession

Conference Organizing Committees

- *ExoNYC3*, Center for Computational Astrophysics — February 9, 2026
- *Emerging Researchers in Exoplanet Science (ERES) VII*, Penn State — August 2022
- *Penn State SETI (PSETI) Symposium*, Penn State — June 2022, June 2023

Group Meeting Organization

- Exoplanets Group, Center for Computational Astrophysics — Fall 2025 – Present
- Stellar Spectroscopy, Center for Computational Astrophysics — Fall 2025 – Present

Committee Membership

- C&D Committee, PSU Astronomy & Astrophysics — August 2019 – August 2023

· C&D Grad. Student Subcommittee, Eberly College of Science — May 2020 – August 2022
· Grad. Student Recruitment Committee, PSU Astronomy & Astrophysics — January 2021 – April 2023
· Grad. Student Representative, PSU Astronomy & Astrophysics — August 2022 – August 2023

Peer Review

· Astronomy & Astrophysics
· The Astrophysical Journal

Collaborations & Memberships

Collaborations

· PoET *(Paranal Solar ESPRESSO Telescope)* — 2025 – Present
· Terra Hunting Experiment — 2024 – Present
· NEID — 2019 – Present

Professional Societies

· American Astronomical Society

Awards & Honors

Award for Excellence in Diversity, Equity, and Inclusion — May 2024
Pennsylvania State University Department of Astronomy & Astrophysics

Earl Nelson Mitchell Scholarship — August 2016 – May 2018
University of North Carolina Department of Physics and Astronomy

Carolina Research Scholar — Conferred May 2018
University of North Carolina at Chapel Hill

Honors Carolina Laureate — Conferred May 2018
University of North Carolina at Chapel Hill

Phi Beta Kappa Society Member — Inducted February 2017
Alpha of North Carolina

Selected Presentations

Oral Presentations

· **Measuring Granulation Jitter in 3D and Probing Depth-Dependent Variability**
GPRV Workshop 2026, All Souls College, Oxford, UK *(contributed)* — September 24, 2026

· **Directly Inferring Center-to-Limb Effects from Stellar Spectra and Consequences for Transmission Spectroscopy**
HoRS3S, Granada, Spain *(contributed)* — July 6, 2026

· **Inferring (Super)Granulation Flows Directly and Quickly from Stellar Spectra**
AAS 247 Winter Meeting, Phoenix, AZ *(contributed)* — January 7, 2026
EPRV 6, Porto, Portugal *(contributed)* — July 2, 2025

· **Resolving Granulation-Driven Line Distortions in Disk-Integrated Solar Spectra**
Know Thy Star 2, Pasadena, CA *(contributed)* — February 3, 2025

· **Mitigating Granulation Noise with Lessons from Synthetic Spectra**
PoET Workshop #2, IA, Portugal *(contributed)* — October 24, 2024
Extremely Precise Radial Velocities 5, Santa Barbara, CA *(contributed)* — March 30, 2023

· **Charting the Path Toward Mitigating Granulation-Driven RV Noise with Synthetic Spectra**
AAS 243 Winter Meeting, New Orleans, LA *(dissertation talk)* — January 10, 2024

· **Insights into Stellar Variability from Ground- and Space-Based Solar Observations**
The Ohio State University, OH *(invited)* September 29, 2023
Instituto de Astrofísica e Ciências do Espaço, Portugal *(invited)* March 1, 2023
University of Warwick, UK *(invited)* February 20, 2023
University of Birmingham, UK *(invited)* February 15, 2023

· **Understanding Granulation Noise with Synthetic Spectra from GRASS**
Sun-as-a-Star Workshop, Flatiron Institute, NYC *(contributed)* March 14, 2023

· **Mitigating Granulation Noise with GRASS and Prospects with PoET**
PoET Workshop, Porto, Portugal *(contributed)* February 24, 2023

· **Toward Mitigating Granulation RV Noise with GRASS**
Emerging Researchers in Exoplanet Science VII, State College, PA *(contributed)* August 2, 2022

Poster Presentations

· **Probing Near-Surface Convection in Cool Stars with a Novel Method of Atmospheric Retrieval**
Cool Stars 23, Tokyo Bay Area, Japan June 2026

· **Magnetism in Motion II: Inferring Line-Asymmetry Effects from SDO Observations**
EPRV 6, Porto, Portugal July 2025

· **Physical Insights into Solar Center-to-Limb RV Variability with SDO**
Emerging Researchers in Exoplanet Science VIII, Yale, New Haven, CT June 2023
Extremely Precise Radial Velocities 5, Santa Barbara, CA March 2023

· **Modeling Granulation's Effect on Stellar Line Shapes and EPRV Surveys with GRASS**
Cool Stars 21, Toulouse, France July 2022

· **Toward Mitigating Granulation RV Noise with GRASS: The GRanulation and Spectrum Simulator**
Exoplanets IV, Las Vegas, NV May 2022

· **Comparing Low-Redshift Compact Dwarf Starbursts in the RESOLVE Survey with High-Redshift Blue Nuggets**
AAS 231 Winter Meeting, National Harbor, MD January 2018

· **Radial-Velocity Signatures of Magnetic Features on the Sun Observed as a Star**
AGU Fall Meeting, New Orleans, LA December 2017

Publications

The full list is curated on SciX and ORCiD, and kept up to date in this publication list.

First-author

2026 **Palumbo, M. L., III**. The Limits of Line Broadening: Modeling Stellar Spectra and Formation Temperatures at High Resolution. *ApJ*, *1006*(1), 55.

2024 **Palumbo, M. L., III**, Saar, S. H., & Haywood, R. D. Characterizing Solar Center-to-limb Radial-velocity Variability with SDO. *ApJ*, *973*(1), 11.

2024 **Palumbo, M. L., III**, Ford, E. B., Gonzalez, E. B., Wright, J. T., Al Moulla, K., & Schlichenmaier, R. GRASS. II. Simulations of Potential Granulation Noise Mitigation Methods. *AJ*, *168*(1), 46.

2023† **Palumbo, M. L., III**, Wright, J. T., & Huston, M. J. Fortuitous Observations of Potential Stellar Relay Probe Positions with GBT. *RNAAS*, *7*(10), 209.

2022 **Palumbo, M. L., III**, Ford, E. B., Wright, J. T., Mahadevan, S., Wise, A. W., & Löhner-Böttcher, J. GRASS: Distinguishing Planet-induced Doppler Signatures from Granulation with a Synthetic Spectra Generator. *AJ*, *163*(1), 11.

2020 **Palumbo, M. L., III**, Kannappan, S. J., Frazer, E. M., Eckert, K. D., Norman, D. J., Fraga, L., … Carr, D. S. Linking Compact Dwarf Starburst Galaxies in the RESOLVE Survey to Downsized Blue Nuggets. *MNRAS*, *494*(4), 4730-4750.

† Non-refereed.

Major Contribution

2026* Gonzalez, E., **Palumbo, M. L., III**, Mahadevan, S., Ford, E. B., Logsdon, S. E., Bender, C. F., ... Terrien, R. C. Shadowing the Sun I: Testing Synthetic Granulation Spectra with NEID Solar Eclipse Observations. *arXiv*, arXiv:2611.03898. (*accepted to ApJ*)

Nth-author

2026 Gupta, A. F., Logsdon, S. E., Luhn, J. K., Fitzmaurice, E., Mahadevan, S., Robertson, P., ... **Palumbo, M. L., III**, ... Wright, J. T. The NEID Earth Twin Survey. VI. Discovery of a Low-Mass Planet Orbiting HD 126053 and RV Signals Near the Rotation Periods of HD 168009 and HD 10780. *arXiv*, arXiv:2609.32097. (*submitted to AAS Journals*)

2026 Lubin, J., Petigura, E., Masuda, K., Halverson, S., Angelo, I., Huber, D., **Palumbo, M. L., III**, ... Wang, X.-Y. Predicting Macroturbulence in F/G/K Dwarfs to 100 m/s Precision. *arXiv*, arXiv:2609.17693. (*submitted to AJ*)

2026 Pandey, K., Ford, E. A., Salzer, J. M., Cisewski-Kehe, J., Zhao, L. L., Gupta, A. F., **Palumbo, M. L., III**, ... Paredes, L. A. Improving the Precision of Line-by-Line Radial Velocities: A Data-Driven Iterative Algorithm for Spectral Line Selection. *arXiv*, arXiv:2606.29552.

2026 Frame, G., Cegla, H. M., Lagae, C., Witzke, V., Watson, C., Shelyag, S., ... **Palumbo, M. L., III**, & Shapiro, A. Synthetic Disc-integrated Absorption Lines Isolating Stellar Granulation for High-precision RV Studies. *MNRAS*, *547*(3), stag418.

2026† Wright, J. T., Gonzalez, E., Premnath, P., Robertson, P., Mahadevan, S., Gupta, A. F., ... **Palumbo, M. L., III**, ... Terrien, R. C. A Simple One-free-parameter Model of the Solar Chromosphere Explains Solar Chromospheric Line Variations Measured by NEID at WIYN during the 2023 October Solar Eclipse. *RNAAS*, *10*(1), 14.

2025 Frame, G., Cegla, H. M., Witzke, V., Lagae, C., **Palumbo, M. L., III**, Shelyag, S., ... Shapiro, A. Towards Understanding Stellar Variability at the Sub m/s Level: Isolating Granulation Signals in Synthetic Spectral Lines. *MNRAS*, *539*(3), 2248-2261.

2024 Ford, E. B., Bender, C. F., Blake, C. H., Gupta, A. F., Kanodia, S., Lin, A. S. J., ... **Palumbo, M. L., III**, ... Stefansson, G. Earths within Reach: Evaluation of Strategies for Mitigating Solar Variability using 3.5 years of NEID Sun-as-a-Star Observations. *arXiv*, arXiv:2408.13318. (*in revision for AAS Journals*)

2024 Carr, D. S., Kannappan, S. J., Norris, M. A., Sinha, M., **Palumbo, M. L., III**, Eckert, K. D., ... Stark, D. V. Identification and Quenching of Nugget Galaxies in the RESOLVE Survey at z = 0. *ApJ*, *968*(1), 18.

2022 Tusay, N., Huston, M. J., Dedrick, C. M., Kerby, S., **Palumbo, M. L., III**, Croft, S., ... Breakthrough Listen. A Search for Radio Technosignatures at the Solar Gravitational Lens Targeting Alpha Centauri. *AJ*, *164*(3), 116.

2022 Haywood, R. D., Milbourne, T. W., Saar, S. H., Mortier, A., Phillips, D., Charbonneau, D., ... **Palumbo, M. L., III**. Unsigned Magnetic Flux as a Proxy for Radial-velocity Variations in Sun-like Stars. *ApJ*, *935*(1), 6.

2022 Zhao, L. L., Fischer, D. A., Ford, E. B., Wise, A., Cretignier, M., Aigrain, S., ... **Palumbo, M. L., III**, ... Szymkowiak, A. E. The EXPRES Stellar Signals Project II. State of the Field in Disentangling Photospheric Velocities. *AJ*, *163*(4), 171.

2019 Milbourne, T. W., Haywood, R. D., Phillips, D. F., Saar, S. H., Cegla, H. M., Cameron, A. C., ... **Palumbo, M. L., III**, ... Walsworth, R. L. HARPS-N Solar RVs Are Dominated by Large, Bright Magnetic Regions. *ApJ*, *874*(1), 107.

2018 Cegla, H. M., Watson, C. A., Shelyag, S., Chaplin, W. J., Davies, G. R., Mathioudakis, M., **Palumbo, M. L., III**, ... Haywood, R. D. Stellar Surface Magneto-convection as a Source of Astrophysical Noise. II. Center-to-limb Parameterization of Absorption Line Profiles and Comparison to Observations. *ApJ*, *866*(1), 55.

† Non-refereed. * Student-led.

Authored Software

2026 **Palumbo, M. L., III**. *FormationTemps.jl.* Zenodo.

2024 **Palumbo, M. L., III**, Saar, S. H., & Haywood, R. D. *sdo-clv-pipeline.* Zenodo.

2023 **Palumbo, M. L., III**, Wright, J. T., & Huston, M. J. *palumbom/seti-fortuitous-obs: v0.1.0.* Zenodo.

2021 **Palumbo, M. L., III**, Ford, E. B., Wright, J. T., Mahadevan, S., Wise, A. W., & Löhner-Böttcher, J. *GRASS: GRanulation and Spectrum Simulator.* Astrophysics Source Code Library, record ascl:2110.011.

2021 Ford, E., Wise, A., & **Palumbo, M. L., III**. *RvSpectML/EchelleCCFs.jl: v0.1.11.* Zenodo.

Theses

2024† **Palumbo, M. L., III**. *Characterizing Variability in Stellar Convective Velocity Fields Toward Enabling 10 cm/s Radial-Velocity Precision* (Doctoral Dissertation, Pennsylvania State University).

2018† **Palumbo, M. L., III**. *Comparing Low-Redshift Compact Dwarf Starbursts in the RESOLVE Survey with High-Redshift Blue Nuggets* (Undergraduate Honors Thesis, University of North Carolina at Chapel Hill).

† Non-refereed.