OANA VESA

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Sunnyvale, California

EDUCATION

Ph.D. in Astronomy, New Mexico State University Expected 2024

Working Thesis Title: *Harnessing the Untapped Potential of Atmospheric Gravity Waves and Chromospheric Swirls to Map Out the Solar Atmosphere*

Thesis Committee: Jason Jackiewicz, Juie Shetye, Jon Holtzman, Laura Boucheron

B.A. in Physics & Mathematics with Honors, Albion College 05/2018

Prentiss M. Brown Honors Program

Thesis Title: *Analysis of the Gaia RVS Region in ESPaDOnS Spectra of Asteroseismic Calibration Stars*

Advisor: Nicolle Zellner

RESEARCH INTERESTS

High-resolution, multi-wavelength observations to investigate oscillatory motions and vortex flows in the lower solar atmosphere.

- Atmospheric Gravity Waves – Characterization of their behavior and potential as atmospheric/magnetic field diagnostics – Theory and observations
- Small-scale Vortex Flows (Chromospheric Swirls) – Characterization of their formation, evolution, and role in transferring energy and mass – Theory and observations

REFEREED PUBLICATIONS

Multiheight Observations of Atmospheric Gravity Waves at Solar Disk Center
Vesa, O., Jackiewicz, J., and Readorn, K., The Astrophysical Journal, Volume 952, Issue 1, article id. 58, 18 pp. (07/2023)

PAPERS IN PREPARATION

Morphological Analysis of Chromospheric Swirls Observed in DST Data
Vesa, O. and Shetye, J., *under review at The Astrophysical Journal* (02/2024).

Multi-Height Observations of Atmospheric Gravity Waves Away from Disk Center
Vesa, O., Morales, J., and Jackiewicz, J., *in preparation.*

AWARDS, HONORS AND GRANTS

Zia Award 2023
"...recognizes outstanding research by a graduate student in the NMSU Astronomy Department."

The Dr. Barry Neil Rappaport Endowed Memorial Scholarship 2023
"...recognition of an exceptional record of public outreach and service or for an

exceptional completed research project in observational astronomy which demonstrates excellence and breadth."

Co-I on Nationwide Eclipse Ballooning Project (NEBP) for New Mexico State University — 2022
PI: Juie Shetye; Atmospheric Science Track Team

A. Scott Murrell Memorial Endowed Scholarship Fund — 2022
"...Recognizes outstanding research or professional development, and related accomplishments that raise the visibility of the NMSU Astronomy Department"

New Mexico Space Grant Consortium Graduate Research Fellowship — 2021, 2022
"Harnessing the Untapped Potential of the Solar Tornadoes"; awarded $10,000

IN THE NEWS

Santa Fe New Mexican Article. NMSU Researchers Shine Light on Solar Tornadoes — 06/17/2023

NMSU Press Release. NMSU Researchers Study Solar Tornadoes' Impact, News Conference in Albuquerque June 5 — 06/01/2023

Las Cruces Sun News Article. NMSU Team to Use Hot-air Balloons to Study Solar Effects Amid Eclipses — 12/05/2022

INVITED TALKS

Stanford Solar Seminar — 01/2024
Title: *"Multi-Height Observations of Propagating Atmospheric Gravity Waves"*

Press Talk for the 242nd American Astronomical Society Meeting in Albuquerque, New Mexico — 06/2023
Title: *Characterizing Tornadoes on the Sun*

Albion College Mathematics & Computer Science Department Colloquium Series — 04/2021
Title: *"Atmospheric Gravity Waves in the Magnetized Solar Atmosphere"*

Preparing for DKIST: Image Processing and Time Series Workshop at California State University, Northridge — 01/2020
Title: *"Gravity Waves in the Photosphere"*

CONFERENCE PRESENTATIONS

Poster Presentation. The American Geophysical Union (AGU) Fall Meeting 20230 — 12/2023
Title: *"Multi-Height Observations of Propagating Atmospheric Gravity Waves"*

Podium Talk. 54th Solar Physics Division Meeting — 08/2023
Title: *"Unlocking the Secrets of Atmospheric Gravity Waves on the Quiet Sun: Observational Insights"*

Poster Presentation. 54th Solar Physics Division Meeting — 08/2023
Title: *"Characterization of Chromospheric Swirls on the Quiet Sun"*

IPoster Presentation. 242nd American Astronomical Society Meeting — 06/2023
Title: *"Characterization of Chromospheric Swirls on the Quiet Sun"*

Virtual Talk. Joint Scientific Assembly IAGA-IASPEI 08/2021
Title: *"Atmospheric Gravity Waves in the Magnetized Lower Solar Atmosphere"*

Virtual Talk. 36th Annual New Mexico Symposium 11/2020
Title: *"The Propagation of Atmospheric Gravity Waves in the Magnetic Solar Atmosphere"*

IPoster Presentation. 51st Solar Physics Division Meeting 08/2020
Title: *"Atmospheric Gravity Waves in the Magnetized Solar Atmosphere"*

Podium Talk. 29th Annual Elkin R. Isaac Student Research Symposium 04/2018
Title: *"Analysis of the Gaia RVS Region in ESPaDOnS Spectra of Asteroseismic Calibration Stars"*

Poster Presentation. 231st American Astronomical Society Meeting 01/2018
Title: *"Analysis of the Gaia RVS Region in ESPaDOnS Spectra of Asteroseismic Calibration Stars"*

Poster Presentation. 229th American Astronomical Society Meeting 01/2017
Title: *"'The Evolution of Starspots on LO Pegasi"*

RESEARCH EXPERIENCE

NSF REU Intern, University of Hawai'i-Mānoa Summer 2017
Topic: *Analyzing the Gaia RVS Region in ESPaDOnS Spectra*
Advisors: Daniel Huber, Eric Gaidos

NSF REU Intern, Ohio Wesleyan University Summer 2016
Topic: *Analysis of starspots on the young solar analog LO Pegasi*
Advisor: Robert Harmon

Summer Research Assistant, Albion College Summer 2015
Topic: *Analysis of the chemical composition and ages of lunar impact glass samples from Apollo 14, 16, and 17 sites*
Advisor: Nicolle Zellner

TEACHING AND MENTORING EXPERIENCE

Co-Instructor with Juie Shetye for ASTR 400: Undergrad Research 03/2023
Developed course material and lectured for three classes about Earth-based atmospheric gravity waves and their connection to solar eclipses

Student Mentor 08/2021 – 08/2022
Undergraduate Mentoring Program for Astronomy Minors

Graduate Teaching Assistant 08/2018 – 05/2019
ASTR 110: Introduction to Astronomy

Undergraduate Teaching Assistant 08/2016 – 12/2016
PHYS 245: Electronics

Albion College Mathematics Tutor 01/2016 – 05/2018

Albion College Physics Peer Mentor 08/2015 – 05/2018

LEADERSHIP AND SERVICE

COFFIES Beans Inaugural Steering Committee Member 01/2024 – Present

Vice-President of the NMSU Astronomy Graduate Student Organization 08/2020 – 08/2023

Graduate Student Outreach Coordinator for the Astronomy Department 08/2020 – 08/2023

Letters to a Pre-Scientist (LPS) Volunteer 08/2020 – 08/2023

OBSERVING EXPERIENCE

Dunn Solar Telescope (ROSA, FIRS) 2022

Dunn Solar Telescope (IBIS, ROSA) 2019

WORKSHOPS AND SUMMER SCHOOLS

AAS Peer Review Training Workshop 06/2023

Preparing for DKIST: He I Diagnostics in the Solar Atmosphere Workshop 02/2022

Preparing for DKIST: An Introduction to Chromospheric Diagnostics Workshop 07/2021

Pennsylvania State University's Center for Astrostatistics: Statistics for Astronomers XVI 07/2021

Preparing for DKIST: Milne-Eddington Spectro-polarimetric Inversions Workshop 07/2020

Preparing for DKIST: Image Processing and Time Series Workshop 01/2020

Preparing for DKIST: An Introduction to Ground-based Data Workshop 06/2019

DKIST Critical Science Plan Workshop on Wave Generation and Propagation 12/2018

RELEVANT SKILLS

Programming Proficient in Python and IDL;
Some experience in Fortran, MATLAB, R, and Perl

Data Reduction Substantial experience in narrowband and broadband data reduction for ground-based instruments