Amanda J White she/her/hers

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Education

PhD in Astrophysics and Planetary Sciences Dec 2023
University of Colorado Boulder
Dissertation: "Understanding Polarization Accuracy: Effects of Dielectric Mirror Coatings on Polarization Behavior at a System Level"

MS in Astrophysics and Planetary Sciences Dec 2018
University of Colorado Boulder

BS in Physics, concentration Astrophysics (*Cum Laude)* Jun 2011
Drexel University
Minor: Mathematics

Skills

Scientific Programming – Python, Mathematica, MATLAB, C++, SQL, IDL, Fortran, LaTeX, Git
Communication – Public speaking, Technical writing and documentation, Technical presentations, Grant writing, Scientific communication
Software – Zemax OpticStudio, Microsoft Office Suite, Google Drive Suite, Dropbox, Keynote, Adobe Illustrator, Affinity Suite, Fiji/ImageJ, Windows, macOS, and Linux operating systems

Experience

Doctoral Researcher May 2017 – Dec 2023
National Solar Observatory (NSO) Boulder, CO
- Analyzed the effects mirror coatings have on depolarization with the NSF's Daniel K. Inouye Solar Telescope (DKIST) as the main use case
- Wrote code predicting polarization properties of thin film coatings given thickness and refractive index in Python
- Quantified the effects of instrument depolarization due to mirrors on DKIST, finding that spatial variations in coating deposition does not significantly impact telescope performance for instruments with margins of error of $5x10^{-4}$ fractional polarization
- Handled, measured, and transported delicate, one-of-a-kind optics for testing purposes, like the DKIST modulator
- Responsible for all instrument maintenance and optical changes for NSO's Boulder-based custom polarimetry system NLSP, as sole user/manager from 2020 – 2022.
- Verified optical coatings on all ten main mirrors of DKIST, all 5 FIDO dichroics, DKIST crystal retarders, and test optics in transmission and reflection, collecting polarimeter data in MATLAB
- Reduced and analyzed lab data with custom Python and Mathematica codebases

Mock Mission Designer May 2021 – Aug 2021
NASA Jet Propulsion Laboratory
- Collaborated with other participants of the JPL Planetary Science Summer School in Space Mission Design to plan a mock New Frontiers class mission to Venus, taking the mission from concept to defending the mission in front of a NASA review board
- Produced mission's science traceability matrix (STM) for final proposal and review board by coalescing information from instrument teams into a polished and digestible format
- Shadowed JPL Team-X Propulsion Chair through concurrent engineering design review

Scientific Staff Jul 2011 – Jul 2016
American Museum of Natural History (AMNH) New York, NY

- Led project to obtain Raman spectrometer for AMNH, identified funding opportunity and collaborated with Curator of Meteorites to produce successfully funded NASA LARS grant
- Developed novel method of collecting reflectance spectroscopy with a confocal microscope and Raman spectrometer simultaneously by connecting a Zeiss LSM 710 to a Princeton Instruments IsoPlane SCT 320, improving the efficiency of data collection
- Imaged aerogel keystones containing particle tracks returned by the NASA Stardust Mission in 3D with a laser scanning confocal microscope
- Mapped keystones with Synchrotron X-Ray Fluorescence for compositional studies to complement imaging
- Characterized Stardust particle tracks based on track size and shape for impact modeling studies
- Created first experimentally obtained point spread function (PSF) in aerogel for laser scanning confocal microscope to be used in image deconvolution

Research Assistant Jun 2008 – Jun 2011
Drexel University Philadelphia, PA

- Calculated UV star formation rates (SFR) of dwarf galaxies in voids to study galaxy evolution
- Extended previous studies for void galaxy colors to much fainter magnitudes
- Compared UV SFR with ALFALFA HI masses to calculate star formation “efficiency”
- Created a catalog of potentially interacting pairs located in voids
- Studied the statistics of interaction locations within voids
- Measured star formation rates from Hα equivalent widths for galaxy pairs
- Contributed target list to a successful observing proposal
- Operated the 2.1m telescope at KPNO during observing run
- Reduced and analyzed spectra obtained at KPNO with IRAF

Summer Researcher Jun 2010 – Aug 2010
Institute for Astronomy Maui, University of Hawai’i Pukalani, HI

- Collaborated with IfA staff on solar observations and data reduction in IDL
- Operated the SOLAR-C telescope independently on Haleakala, Maui, HI
- Modified spectropolarimeter to take polarization measurements of the solar disk at 2 μm by refocusing liquid crystal variable retarders
- Responsible for troubleshooting a vacuum system and a FTIR system independently
- Made first observations of the infrared second solar spectrum

Summer Researcher Jun 2009 – Aug 2009
State University of New York at Stony Brook Stony Brook, NY

- Reduced and analyzed mid-IR spectrum of brown dwarf HN PEG B using Spitzer data
- Classified spectral type and measured CH_4 and NH_3 spectral indices for brown dwarf HN PEG B

Mentorship

APS Binary Stars Aug 2020 – May 2022
Univ. Colorado Boulder, Dept. of Astrophysical and Planetary Sciences Boulder, CO

- Served as a peer mentor to new graduate students, welcoming them to the APS department and ensuring they were adapting to graduate school during the COVID pandemic lockdown via 1-on-1 engagement
- Assisted mentees with navigating through University policy and requirements for advancing to candidacy

CU Prime Mentoring Program Aug 2018 – May 2019
Univ. Colorado Boulder, Dept. of Physics Boulder, CO

- Served as a mentor for 3 undergraduates from underrepresented populations majoring in Physics and Astrophysics

- Discussed classes and explained physics topics mentees were struggling with at bi-weekly group check-ins.
- Acted as a resource for navigating University policy and general questions for first-generation college students; assisted them in finding research opportunities on campus – 2 mentees were hired by physics research groups of their choice for the following summer

AMNH Science Research Mentoring Program Sep 2015 – Jun 2016
American Museum of Natural History, Dept. of Education New York, NY

- Supervised a team of 4 student research interns, providing research and methodology training as well as instruction in relevant planetary science, equipment usage, and documentation concepts
- Managed research project characterizing samples by examining thousands of images to compare the effect of human judgment when visually measuring individual images of various noise levels for statistical analysis
- Assisted students with college applications and career exploration in STEM fields

Teaching

Teaching Assistant Aug 2016 – May 2018
Department of Astrophysical & Planetary Sciences, CU Boulder Boulder, CO

- Lab TA for ASTR 1030 - *Accelerated Introductory Astronomy I*,
  a fast paced introductory course tailored toward astronomy majors
- TA for ASTR 1000 - *The Solar System*
  an introductory course tailored towards non-science majors
- Lab TA for ASTR 1010 - *Introductory Astronomy I*
  an introductory course tailored towards non-science majors
- Responsible for grading all course assignments and exams, providing constructive, positive feedback to students in a timely manner
- Taught two lab sections that ran concurrent with the course

Science Research Mentoring Program (SRMP) Mentor New York, NY
Department of Education, AMNH Aug 2015 – May 2016

- Research mentor for 4 NYC high school students for the 2015-2016 academic year
- Advised students on a project to characterize NASA Stardust cometary on work related directly to what the AMNH team was researching
- Met with students 4hrs/week to discuss planetary science and goals of the project
- One student presented her work competitively and advanced to the 2017 New York City Science & Engineering Festival (NYCSEF), a regional qualifier for the 2017 Intel International Science and Engineering Fair

AMNH After School Program Lecturer New York, NY
Department of Education, AMNH Feb 2012 – May 2016

- Instructed one 8-week session of *Cosmology* and four 8-week sessions of *Secrets of the Solar System* for classes of ~25 high school students
- Cultivated interest in the sciences and encouraged exploration through interactive classroom activities and use of the Hayden Planetarium and Museum exhibits
- Collaborated with AMNH Education staff to revamp the curriculum for the Cosmology course and refined several activities in the Secrets of the Solar System course

Adjunct Lecturer New York, NY
Department of Physics and Astronomy, Hunter College Aug 2012 – Dec 2012

- Lecturer for Astronomy 101 evening classes
- Instructed bi-weekly computer and classroom labs by demonstrating concepts, such as phases of the moon, with props and running hands-on activities
- Directed review sessions for students and cemented class material through engaging games

Service and Leadership Activities

Graduate Concerns and Curriculum Committee (GCCC) Aug 2019 – Aug 2023
University of Colorado Boulder, Dept. of Astrophysical & Planetary Sciences
- Served as a representative of the graduate student body for presenting APS graduate student concerns and needs to the APS faculty; elected to the position yearly by my peers
- Collaborated with faculty counterparts of GCCC to address student needs including a complete redesign of the department's core curriculum, comprehensive exam, and requirements for advancing to candidacy to be more robust and equitable for all students
- Lobbied for and co-authored a department grievance policy that conformed to University standards
    - Influenced a University-wide grievance policy change at the Graduate School level
- Organized and ran monthly forums where graduate students could discuss happenings of the department and air concerns as necessary

Women and Gender Minorities Mentoring Circle Oct 2017 – Dec 2023
University of Colorado Boulder, Dept. of Astrophysical & Planetary Sciences
- Co-created a space for women and gender minorities associated with the APS department to meet and support each other in an informal setting
- Facilitated events and social gatherings to encourage community and peer support structures

Faculty Search, Graduate Student Representative SP 2017, SP 2019
University of Colorado Boulder, Dept. of Astrophysical & Planetary Sciences
- Represented the graduate student body during interviews with faculty candidates
- Authored interview questions on teaching philosophy
- Collected and collated student feedback after public Q&A sessions
- Presented student feedback on each candidate to APS faculty

Graduate Teacher Program Lead for APS Jul 2017 – Jul 2018
University of Colorado Boulder, Graduate School
- Facilitated communication between the Graduate School and home department
- Mentored department TAs in order to improve teaching ability and self confidence in graduate students

Society of Physics Students Sep 2007 – Jun 2011
Drexel University, Department of Physics
Chapter President - 2008 – 2010, Treasurer - 2010 - 2011 & 2007 - 2008
As chapter president:
- Obtained University recognition and funding as a student organization
- Doubled chapter size through recruitment
- Chapter started award-winning outreach mentorship program at Independence Charter School
- Revitalized Drexel University's Chapter of ΣΠΣ (Sigma Pi Sigma)
- Nominated for Zone 3 Associate Zone Councilor, 2010

Chapter received 10 national awards while President
- Outstanding Chapter Award, Zone 3, 2010, 2009
- Marsh White Outreach Award, 2010, 2009, 2008
- Sigma Pi Sigma Undergraduate Research Award, 2010, 2008
- Sigma Pi Sigma Project Award, 2010, 2009
- SPS Reporter Award, 2008

Grants

- NASA LARS equipment grant, **116k** 2014
- NASA LARS three-year research grant, **390k** 2016 – 2018

Honors & Awards

Chance Irick Cooke Endowed Fellowship, CU Boulder	2023
3 Minute Thesis Finalist, CU Boulder	2022, 2023
George Ellery Hale Graduate Fellow, CU Boulder Full tuition and stipend	2017 - 2020
Barry M. Goldwater Scholar	2010
Walter R. Coley Award, Drexel University	2011
Drexel College of Arts and Sciences Research Day Undergraduate Natural Sciences, 1st Place	2011
Inducted to ΣΠΣ Physics Honor Society	2010
A.J. Drexel Scholarship, Drexel University Full Tuition	2007 - 2011
Lorenzo Narducci Memorial Scholarship, Drexel University	2010
M. Russell Wehr Physics Award, Drexel University	2009
Drexel University Research Day, Honorable Mention	2009
College of Arts and Sciences Research Day Undergraduate Natural Sciences, 3rd Place	2009
Students Tackling Advanced Research (STAR) Scholar, Drexel University	2008

Publications

White, A.J. & Harrington, D.M., (2025) “Effect of mirror coating non-uniformity on depolarization.” *In Prep.*

White, A.J. & Harrington, D.M., (2025) “Modeling the polarization behavior of multi-layered mirror coatings for system-level polarization modeling of DKIST.” *In Prep.*

White, A.J., (2023) "Understanding Polarization Accuracy: The Effect of Dielectric Mirror Coatings on Instrument Polarization Behavior at a System Level." *Univ. Colorado at Boulder, ProQuest Dissertations Publishing,* 30813645.

Harrington, D.M., Sueoka, S.R., Schad, T.A., Beck, C., Eigenbrot, A.D., de Wijn, A.G., Casini, R., **White, A.J.**, Jaeggli, S.A., (2023) “Systems Approach to Polarization Calibration for the *Daniel K. Inouye Solar Telescope*,” *Solar Phys.* 298, 10.

Harrington, D.M., Wöger, F., **White, A.J.**, Sueoka, S.R., (2021) "Polarization modeling and predictions for Daniel K. Inouye Solar Telescope, part 9: Flux Distribution with FIDO," *J. Astron. Telesc. Instrum. Syst.* 7(4) 048005.

Harrington, D.M., Schad, T.A., Sueoka, S.R., **White, A.J.**, (2021) "Polarization modeling and predictions for DKIST, part 8: calibration polarizer spatial variation impacts," *J. Astron. Telesc. Instrum. Syst.* 7(3) 038002.

Harrington, D.M., Sueoka, S.R., & **White, A.J.**, Eigenbrot, A., Schad, T.A., (2021) "Polarization modeling and predictions for Daniel K. Inouye Solar Telescope, part 7: preliminary NCSP system calibration and model fitting," *J. Astron. Telesc. Instrum. Syst.* 7(1) 018004.

Harrington, D.M., Jaeggli, S.A., Schad, T.A., **White, A.J.**, Sueoka, S.R., (2020) "Polarization modeling and predictions for Daniel K. Inouye Solar Telescope, part 6: fringe mitigation with polycarbonate modulators and optical contact calibration retarders," *J. Astron. Telesc. Instrum. Syst.* 6(3) 038001.

Harrington, D.M., Sueoka, S.R., & **White, A.J.**, (2019) "Polarization modeling and predictions for Daniel K. Inouye Solar Telescope part 5: impacts of enhanced mirror and dichroic coatings on system polarization calibration." *J. Astron. Telesc. Instrum. Syst.* 5(3) 038001.

Gainsforth, Z., Westphal, A.J., Butterworth, A.L., Jilly-Rehak, C.E., Brownlee, D.E., Joswiak, D.J., Ogliore, R.C., Zolensky, M.E., Bechtel, H.A., Ebel, D.S., Huss, G.R., Sandford, S.A. and **White, A.J.** (2019), "Fine-grained material associated with a large sulfide returned from Comet 81P/Wild 2". *Meteorit Planet Sci*, **54**: 1069-1091.

Moorman, C.M., Moreno, J., **White, A.J.**, Vogeley, M.S., Hoyle, F., Giovanelli, R., Haynes, M.P., (2016) “On the Star Formation Properties of Void Galaxies” *ApJ* **831**, pp 118-131.

White, A.J. & Ebel, D. S., (2015) “Imaging Samples in Silica Aerogel Using an Experimental Point Spread Function.” *Microscopy and Microanalysis* **21**, pp 172-178.

Extended Abstracts

Alpert, H., Ahrens, C., Bell, T., Bierson, C., Bonnet, K., Dhingra, R., Dinsmore, R., Dzurilla, K., Garland, J., Gustafson, E.L., Knicely, J., Kremer, C., Lowry, V., Naz, N., Niemoeller, S., O'Brien, P., **White, A.J.**, Zucherman, A., Lowes, L., Hudson, T., Mitchell, K., (2022) "Verne: Revealing the mysteries and histories of Venus" *Lunar Planet Sci* **LIII**.

Gainsforth, Z., Butterworth, A. L., Jilly-Rehak, C. E., Westphal, A. J., Brownlee, D. E., Joswaik, D., Ogliore, R. C., Zolensky, M. E., Bechtel, H. A., Ebel, D. S., Huss, G. R., Sandford, S. A., **White, A.J.**, (2016) "Possible Gems and Ultra-Fine Grained Polyphase Units in Comet Wild 2" *Lunar Planet Sci* **XLVII**, 2366.

White, A.J., Ebel, D. S., Greenberg, M., (2014) "Nondestructive Three-Dimensional Confocal Imaging and SXRF of Whole Stardust Tracks in Aerogel" *Lunar Planet Sci* **XLV**, 2292.

White, A.J., Ebel, D. S., Greenberg, M., (2013) "An Improved Experimental Deconvolution Technique for 3-Dimensional Laser Confocal Microscopy of Particles in Aerogel" *Lunar Planet Sci* **XLIV**, 1630.

White, A.J., Ebel, D. S., Greenberg, M., (2012) "Comparison of Deconvolution Techniques in 3-Dimensions of Stardust Tracks in Aerogel" *Lunar Planet Sci* **XLIII**, 1542.