

Charlotte M. Wood | CV

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Education

University of Notre Dame

Notre Dame, IN

Ph.D. Physics

August 2022

"Testing the Top Rung of the Distance Ladder: Understanding Type Ia Supernova Variations and their Effect on the Hubble Constant"

Advisor: Dr. Peter Garnavich

Hofstra University

Hempstead, NY

B.S. Physics, Minor in Astronomy

May 2016

Magna Cum Laude, High Departmental Honors, Honors College Graduate with Distinction

Advisor: Dr. Stephen S. Lawrence

Professional Appointments

Astronomy & Astrophysics Prize Postdoctoral Fellow

Ames, IA

Department of Physics & Astronomy, Iowa State University

September 2022 - present

Research Interests

- **Type Ia Supernovae** – Using observational methods to distinguish between different progenitor scenarios for specific supernovae
- **Supernova Cosmology** – Exploring the effect of type Ia supernova systematics on the Hubble constant
- **Light Echoes** – Mapping the dust distribution around supernovae to study progenitors and the local environment

Publications

- *Benchmarking Substellar Evolutionary Models Using New Age Estimates for HD 4747 B and HD 19467 B*
C. M. Wood, T. Boyajian, K. von Braun, J. M. Brewer, J. R. Crepp, G. Schaefer, A. Adams, & T. R. White; *The Astrophysical Journal*, 873, 83 (doi:10.3847/1538-4357/aafe01; arXiv:1901.03687)
- *Infrared Surface Brightness Fluctuation Distances to Type Ia Supernova Hosts: Testing the Top Rung of the Distance Ladder*
P. Garnavich, **C. M. Wood**, P. Milne, J. Jensen, J. Blakeslee, P. Brown, D. Scolnic, D. Brout, & B. Rose; submitted to *The Astrophysical Journal* (arXiv:2204.12060)
- *The Pantheon+ Type Ia Supernova Sample: Cosmological Constraints*
D. Brout, D. Scolnic, B. Popovic, A. G. Riess, J. Zuntz, R. Kessler, A. Carr, T. M. Davis, S. Hinton, D. O. Jones, W. D. Kenworthy, E. R. Peterson, K. Said, G. Taylor, N. Ali, P. Armstrong, P. Charvu, A. Dwomoh, A. Palmese, H. Qu, B. M. Rose, C. W. Stubbs, M. Vincenzi, **C. M. Wood**, P. J. Brown, R. Chen, K. Chambers, D. A. Coulter, M. Dai, G. Dimitriadis, A. V. Filippenko, R. J. Foley, S. W. Jha, L. Kelsey, R. P. Kirshner, A. Möller, J. Muir, S. Nadathur, Y.-C. Pan, A. Rest, C. Rojas-Bravo, M. Sako, M. R. Siebert, M. Smith, B. E. Stahl, & P. Wiseman; *The Astrophysical Journal*, in press (arXiv:2202.04077)

- *The Pantheon+ Type Ia Supernova Sample: The Full Dataset and Light-curve Release*
D. Scolnic, D. Brout, A. Carr, A. G. Riess, T. M. Davis, A. Dwomoh, D. O. Jones, N. Ali, P. Charvu, R. Chen, E. R. Peterson, B. Popovic, B. M. Rose, **C. M. Wood**, P. J. Brown, D. A. Coulter, K. G. Dettman, G. Dimitriadis, A. V. Filippenko, R. J. Foley, S. W. Jha, C. D. Kilpatrick, R. P. Kirshner, Y.-C. Pan, A. Rest, C. Rojas-Bravo, M. R. Siebert, B. E. Stahl, & W. Zheng; *The Astrophysical Journal Letters*, in press (arXiv:2112.03863)
- *The Pantheon+ Supernova Ia Sample: SuperCal-Fragilistic Cross Calibration, Retrained SALT2 Light Curve Model, and Calibration Systematic Uncertainty*
D. Brout, G. Taylor, D. Scolnic, **C. M. Wood**, B. M. Rose, M. Vincenzi, A. Dwomoh, C. Lidman, A. Riess, N. Ali, H. Qu, M. Dai, & C. Stubbs; *The Astrophysical Journal*, in press (arXiv:2112.03864)
- *Infrared Surface Brightness Fluctuation Distances for MASSIVE and Ia Supernova Host Galaxies*
J. B. Jensen, J. P. Blakeslee, C.-P. Ma, P. A. Milne, P. J. Brown, M. Cantiello, P. M. Garnavich, J. E. Greene, J. R. Lucey, A. Phan, R. B. Tully, & **C. M. Wood**; *The Astrophysical Journal Supplement Series*, 255, 21 (doi:10.3847/1538-4365/ac01e7; arXiv:2105.08299)
- *Rapid Variability in the Wind from the White Dwarf Merger Candidate J005311*
P. Garnavich, C. Littlefield, R. Pogge, & **C. M. Wood**; *Research Notes of the American Astronomical Society*, 4, 167 (doi:10.3847/2515-5172/abbb8b; arXiv:2009.12380)
- *The TRENDS High-Contrast Imaging Survey. VIII. Compendium of Benchmark Objects*
E. J. Gonzales, J. R. Crepp, E. B. Bechter, **C. M. Wood**, J. A. Johnson, B. T. Montet, H. Isaacson, & A. W. Howard; *The Astrophysical Journal*, 893, 27 (doi: 10.3847/1538-4357/ab71fb; arXiv:2010.11866)
- *High-Time-Resolution Photometry of AR Scorpii: Confirmation of the White Dwarf's Spin-Down*
R. A. Stiller, C. Littlefield, P. Garnavich, **C. M. Wood**, F.-J. Hambsch, & G. Myers; *The Astronomical Journal*, 156, 150 (doi:10.3847/1538-3881/aad5dd; arXiv:1802.04323)

Invited Talks

- **Connecting the Variations in Type Ia Supernovae to Progenitors and the H_0 Tension**
Seminar, Iowa State University, Sep. 2022
Tea Talk, KIPAC, Stanford University, Jan. 2022
- **Testing the Top Rung of the Distance Ladder: Comparing H_0 Using SBF & Cepheid Distances**
Seminar, CIERA, Northwestern University, Nov. 2021
Seminar, University of Arizona, Oct. 2021
Seminar, Duke University, Oct. 2021
Tea Talk, KIPAC, Stanford University, Oct. 2021
Seminar, University of Kansas, Oct. 2021
- **Echoes of Silence: Probing Type Ia Supernova Environments with Scattered Light Echoes**
Seminar, Michiana Astronomical Society, Apr. 2021
Colloquium, Utah Valley University, Mar. 2021
Colloquium, University of Louisville, Feb. 2021
Seminar, University of Notre Dame, Oct. 2020
- **The Slowly Fading Light Echo Around Type Ia Supernova 2009ig**
Seminar, University of Notre Dame, Mar. 2019
- **Navigating Graduate School**
Seminar, Hofstra University, Mar. 2019

Conference Presentations

- **Testing the Top Rung of the Distance Ladder: Comparing H_0 Using SBF & Cepheid Distances**
Talk, Graduate Physics Society Annual Conference, University of Notre Dame, Dec. 2021
- **Rapid Variability in the Wind from the White Dwarf Merger Candidate J005311**
iPoster, 237th Meeting of the American Astronomical Society, Virtual, Jan. 2021
- **The Evolution of the Light Echo Around Type Ia Supernova 1998bu**
Poster, 235th Meeting of the American Astronomical Society, Honolulu, HI, Jan. 2020
- **The Slowly Fading Light Echo Around Type Ia Supernova 2009ig**
Poster, Graduate Physics Society Annual Conference, University of Notre Dame, Nov. 2019
Poster, Midwest Workshop on Supernovae & Transients, Ohio State University, Sep. 2019
Talk, Graduate Physics Society Annual Conference, University of Notre Dame, Apr. 2019
Talk, Midwest Workshop on Supernovae & Transients, University of Chicago, Feb. 2019
Poster, 233rd Meeting of the American Astronomical Society, Seattle, WA, Jan. 2019
- **Benchmarking Substellar Evolutionary Models Using New Age Estimates for HD 4747 B and HD 19467 B**
Talk, College of Science and Engineering Joint Annual Meeting, University of Notre Dame, Dec. 2018
Poster, AWIS Women in Science Regional Conference, University of Notre Dame, Oct. 2018
- **Precise Ages for the Benchmark Brown Dwarfs HD 19467 B and HD 4747 B**
Poster, 231st Meeting of the American Astronomical Society, Washington D.C., January 2018
- **The Origin of Metals in Extremely Low Mass White Dwarfs**
Poster, Undergraduate Research Day, Hofstra University, Dec. 2015

Observing Experience

- Observing Runs at the W. M. Keck Observatory** **Waimea, HI**
University of Notre Dame *June 2019, June 2020*
Remote observing from the W. M. Keck Observatory Headquarters and the University of Notre Dame. Total of one 1/2 night on DEIMOS & one 1/2 night on LRIS.
- Observing Runs at the Large Binocular Telescope** **Tucson, AZ**
University of Notre Dame *Oct. 2018 - Jan. 2022*
Remote observing from the University of Arizona for projects submitted by OSURC member institutions. Total of 43 nights using LBC, MODS, LUCI, & PEPSI.
- Observing Run at Cerro Tololo Interamerican Observatory** **La Serena, Chile**
Hofstra University *Oct./Nov. 2014*
Traditional observing with the 0.8m SMARTS telescope at CTIO. Total of 3 nights.

Teaching Experience

- Physics Research Writing Consultant** **Notre Dame, IN**
University of Notre Dame *Fall 2020 - Spring 2022*
Trained by the University Writing Center in general writing pedagogy principles to work as a writing consultant specifically for members of the Physics Department (students, post-docs, professors, etc.).
- Instructor - Scientific Writing for the REU** **Notre Dame, IN**
University of Notre Dame *Summer 2021*
Designed & ran a shortened version of the Scientific Writing for Physicists course. Introduced the REU students to more planning & drafting tools, as well as talked to them about how to write a good scientific paper and how to make effective figures & tables.

Physics Teaching Practicum*University of Notre Dame***Notre Dame, IN***Fall 2018 - Spring 2022*

Covered six lectures under observation of another instructor and created a teaching portfolio. Classes: Introduction to Astrophysics (3; undergraduate), Physics of Astrophysics (1; undergraduate/graduate), Scientific Writing (1; graduate), Descriptive Astronomy (1; undergraduate)

Teaching Assistant for Descriptive Astronomy*University of Notre Dame***Notre Dame, IN***Fall 2016, Fall 2017-Fall 2020, Spring 2022*

Responsibilities include running the observatory, organizing help sessions, helping proctor exams, helping rewrite observing projects, and grading for the non-science majors introductory astronomy class. Lead TA from Fall 2017-Spring 2019 and for Fall 2020.

Teaching Assistant for Modern Observational Techniques*University of Notre Dame***Notre Dame, IN***Fall 2019, 2021*

Responsibilities include creating answer keys and grading homework assignments for the graduate student methods class.

Teaching Assistant for Physics of Astrophysics*University of Notre Dame***Notre Dame, IN***Fall 2018, 2020, 2021*

Responsibilities include grading and assisting with homework assignments and running an observing session for the introductory graduate student astrophysics class.

Teaching Assistant for Lasers and Modern Optics*University of Notre Dame***Notre Dame, IN***Spring 2017*

Responsibilities include setting up and testing labs, grading lab reports, and proctoring an exam for the junior/senior undergraduate optics class/lab.

Activities & Outreach

Writing Tutor for the Warrior-Scholar Project*University of Notre Dame***Notre Dame, IN***July 2021 & June 2022*

Helped the scholars navigate and adjust to reading & writing in a university environment. Provided guidance on written work and answered questions about the given prompt.

Graduate Physics Society Public Relations Chair*University of Notre Dame***Notre Dame, IN***Fall 2020 - Spring 2021*

Serving as the chair of the PR committee for the physics graduate student organization. Responsibilities include circulating a newsletter with upcoming events & news and maintaining social media accounts & the website.

Graduate Physics Society Executive Board*University of Notre Dame***Notre Dame, IN***Summer 2018 - Spring 2020*

Served as the astronomy group representative on the executive board for the physics graduate student organization. E-board acts as a bridge between the graduate students and the department and helps organize all GPS events.

Association for Women in Science Physics Department Representative*University of Notre Dame***Notre Dame, IN***Fall 2019 - Spring 2020*

Department representatives act as a liaison between AWIS and their respective departments and help organize & promote professional development events that support women in science.

Mid-Autumn Festival Celebration*University of Notre Dame***Notre Dame, IN***October 2020*

Gave a presentation about the Moon and planned to observe the Moon remotely (observing was clouded out) as part of a celebration of the Mid-Autumn Festival with the Chinese Culture Society.

Faculty Observing Night*University of Notre Dame***Notre Dame, IN***March 2020*

Set up telescopes and answered questions during a night of public observing with faculty and their families.

Our Universe Revealed*University of Notre Dame***Notre Dame, IN***December 2019*

Set up demonstrations for a public lecture on the extremes of the solar system.

Mercury Transit Event

University of Notre Dame

Notre Dame, IN

November 2019

Helped coordinate an event on campus for Notre Dame students to observe the Mercury transit.

Apollo 11 50th Anniversary Celebration

Bittersweet Elementary School

Mishawaka, IN

July 2019

Set up interactive demos and ran telescopes for solar observing as part of an event celebrating the 50th anniversary of the Moon landing.

JINA-CEE Art-2-Science Camp

University of Notre Dame

Notre Dame, IN

July 2019

Guided elementary & middle school students through craft activities to teach them about sound.

Science Alive

University of Notre Dame

Notre Dame, IN

February 2019

Helped with interactive demonstrations that teach physics & astronomy to children in the local community.

Summertime Stargazing

University of Notre Dame

Notre Dame, IN

July/August 2018

Assisted with two large public observing events, set up telescopes and helped answer questions.

Observing for Physics of Atomic Nuclei Students

University of Notre Dame

Notre Dame, IN

June 2018

Held an observing night for high school students attending the JINA-CEE Physics of Atomic Nuclei camp.

Expanding Your Horizons

University of Notre Dame

Notre Dame, IN

April 2018

Ran a workshop to teach middle school girls about exoplanets and helped them craft their own papier-mâché exoplanets.

Awards

Astronomy & Astrophysics Prize Postdoctoral Fellowship

Iowa State University

Fall 2022

This 3-year fellowship supports independent research by an early-career scientist in astronomy and astrophysics.

Sigma Xi Grant in Aid of Research

University of Notre Dame

Fall 2019

Grant from Sigma Xi to pay for travel expenses to and from a research site, or for purchase of non-standard laboratory equipment necessary to complete a specific research project.

Graduate School Professional Development Award

University of Notre Dame

Spring 2019

Grant from the ND College of Science to support research-related travel, excluding presenting at conferences.

Arthur J. Schmitt Leadership Fellowship

University of Notre Dame

Spring 2016

This fellowship is awarded to the top 15 students in the ND Colleges of Science and Engineering each year.

Skills

Computer Languages/Programs: Python, IRAF/PyRAF, \LaTeX , Mathematica, MATLAB, IDL, Git.

Spoken Languages: English (native), Spanish (limited working proficiency), Italian (elementary).

Professional Organizations

- **American Astronomical Society**
AAS is the major organization of professional astronomers in North America. Their mission is to enhance and share humanity's scientific understanding of the universe.
- **Association for Women in Science**
AWIS is dedicated to driving excellence in STEM by achieving equity and full participation of women in all disciplines and across all employment sectors.
- **Sigma Xi**
Sigma Xi, The Scientific Research Honor Society, is the international honor society of science and engineering.
- **Phi Beta Kappa**
ΦBK aims to promote and advocate excellence in the liberal arts and sciences and to induct the most outstanding students of arts and sciences at American colleges and universities.
- **Sigma Pi Sigma**
ΣΠΣ exists to honor outstanding scholarship in physics and to provide a fellowship of persons who have excelled in physics.

References

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| ○ Dr. Peter A. Milne
Research Professor, Lecturer for Astronomy
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