

Charlotte M. Wood

Address: 2323 Osborn Drive, Physics 0012, Ames, IA 50011

Email: cwood12@iastate.edu * *Phone:* +1 515-294-2816

Website: <https://charlottenwood.com>

Education

Ph.D., University of Notre Dame

January 2023

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

Advisor: Dr. Peter Garnavich

B.S., Hofstra University

May 2016

Major: *Physics*; **Minor:** *Astronomy*

Magna cum laude; High Departmental Honors; Honors College Graduate with Distinction

Advisor: Dr. Stephen S. Lawrence

Professional Appointments

Astronomy & Astrophysics Prize Postdoctoral Fellow

Sept. 2022 - present

Iowa State University

Ames, Iowa

Advisor: Dr. Frank Krennich

Research Interests

Type Ia Supernovae	Using observational methods to understand the physics driving the explosion (progenitors, ignition mechanism, etc.)
Supernova Cosmology	Using type Ia supernovae to measure fundamental properties of the universe (i.e., the Hubble constant, dark energy)
Light Echoes	Using reflected light to map the dust around transient & variable sources and to determine extragalactic dust properties

Grants Awarded

HST Cycle 30 Archival Research Program

Jan. 2023 - Dec. 2025

Revisiting SH0ES: A Search for Light Echoes Around Type Ia Supernovae

- **Role:** Principal Investigator
- **PI(s):** C. M. Wood (Iowa State), P. Garnavich (Notre Dame), S. Lawrence (Hofstra)
- **Amount:** \$47,676 (Iowa State total)

NASA Roman Space Telescope Research & Support Opportunity

Nov. 2023 - Sept. 2028

A Roman Project Infrastructure Team to Support Cosmological Measurements with SNe Ia

- **Role:** Co-Investigator
- **PI(s):** D. Scolnic (Duke), B. Rose (Baylor), R. Hounsell (NASA), D. Rubin (Hawaii)
- **Amount:** ~ \$11M (total across all institutions)

HST Cycle 31 General Observer Program

Jan. 2024 - Dec. 2025

Extending Precision Cosmology to Early Hosts of SNe Ia via SBF Distances

- **Role:** Co-Investigator
- **PI(s):** P. Milne (Arizona), J. Jensen (Utah Valley), J. Blakeslee (NOIRLab), P. Garnavich (Notre Dame), C. M. Wood (Iowa State), P. Brown (Texas A&M)
- **Amount:** \$10,513 (Iowa State total)

Fellowships & Awards

Dec. 2019	Sigma Xi Grant in Aid of Research
Mar. 2019	Graduate School Professional Development Award
Sept. 2016	Arthur J. Schmitt Leadership Fellowship
Feb. 2015	Harold E. Clearman Memorial Award

Publications

First Author: 2; Co-Author: 8; Total: 10.

1. Detection of a Light Echo and Characterization of the Local Dust Environment Around Type Ia Supernova 2009ig, *in preparation*
C. M. Wood, P. Garnavich, S. Lawrence, A. Rest, P. Milne, D. Drozdov, A. Riess
2. Benchmarking Substellar Evolutionary Models Using New Age Estimates for HD 4747 B and HD 19467 B, *The Astrophysical Journal*, 873, 83 (doi:10.3847/1538-4357/aafe01; arXiv:1901.03687)
C. M. Wood, T. Boyajian, K. von Braun, J. M. Brewer, J. R. Crepp, G. Schaefer, A. Adams, & T. R. White
3. Connecting Infrared Surface Brightness Fluctuation Distances to Type Ia Supernova Hosts: Testing the Top Rung of the Distance Ladder, *The Astrophysical Journal*, in press (arXiv:2204.12060)
P. Garnavich, C. M. Wood, P. Milne, J. Jensen, J. Blakeslee, P. Brown, D. Scolnic, D. Brout, & B. Rose
4. The Pantheon+ Type Ia Supernova Sample: The Full Data Set and Light-Curve Release, *The Astrophysical Journal*, 938, 113 (doi:10.3847/1538-4357/ac8b7a; arXiv:2112.03863)
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
5. The Pantheon+ Type Ia Supernova Sample: SuperCal-Fragilistic Cross Calibration, Retrained SALT2 Light Curve Model, and Calibration Systematic Uncertainty, *The Astrophysical Journal*, 938, 111 (doi:10.3847/1538-4357/ac8bcc; arXiv:2112.03864)
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
6. The Pantheon+ Type Ia Supernova Sample: Cosmological Constraints, *The Astrophysical Journal*, 938, 110 (doi:10.3847/1538-4357/ac8e04; arXiv:2202.04077)
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
7. Infrared Surface Brightness Fluctuation Distances for MASSIVE and Ia Supernova Host Galaxies, *The Astrophysical Journal Supplement Series*, 255, 21 (doi:10.3847/1538-4365/ac01e7; arXiv:2105.08299)
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
8. Rapid Variability in the Wind from the White Dwarf Merger Candidate J005311, *Research Notes of the AAS*, 4, 167 (doi:10.3847/2515-5172/abbb8b; arXiv:2009.12380)
P. Garnavich, C. Littlefield, R. Pogge, & C. M. Wood
9. The TRENDS High-Contrast Imaging Survey. VIII. Compendium of Benchmark Objects, *The Astrophysical Journal*, 893, 27 (doi: 10.3847/1538-4357/ab71fb; arXiv:2010.11866)
E. J. Gonzales, J. R. Crepp, E. B. Bechter, C. M. Wood, J. A. Johnson, B. T. Montet, H. Isaacson, & A. W. Howard

10. High-Time-Resolution Photometry of AR Scorpii: Confirmation of the White Dwarf's Spin-Down, *The Astronomical Journal*, 156, 150 (doi:10.3847/1538-3881/aad5dd; arXiv:1802.04323)
R. A. Stiller, C. Littlefield, P. Garnavich, **C. M. Wood**, F.-J. Hamsch, & G. Myers

Invited Talks

Mar. 2023	Hofstra University, Hempstead, NY
Jan. 2023	University of Notre Dame, South Bend, IN (virtual)
Jan. 2023	241st Meeting of the AAS (SH0ES/Pantheon+ Special Session), Seattle, WA
Sept. 2022	Iowa State University, Ames, IA
Jan. 2022	KIPAC, Stanford University, Stanford, CA (virtual)
Nov. 2021	CIERA, Northwestern University, Evanston, IL (virtual)
Oct. 2021	University of Arizona, Tucson, AZ
Oct. 2021	Duke University, Durham, NC (virtual)
Oct. 2021	KIPAC, Stanford University, Stanford, CA (virtual)
Oct. 2021	University of Kansas, Lawrence, KS (virtual)
Apr. 2021	Michiana Astronomical Society, South Bend, IN (virtual)
Mar. 2021	Utah Valley University, Orem, UT (virtual)
Feb. 2021	University of Louisville, Louisville, KY (virtual)
Oct. 2020	University of Notre Dame, South Bend, IN (virtual)
Mar. 2019	University of Notre Dame, South Bend, IN
Mar. 2019	Hofstra University, Hempstead, NY

Contributed Talks & Presentations

June 2023	The Transient & Variable Universe, University of Illinois Urbana-Champaign (talk)
Jan. 2023	241st Meeting of the AAS, Seattle, WA (dissertation talk)
Dec. 2021	Graduate Physics Society Annual Conference, University of Notre Dame (talk)
Jan. 2021	237th Meeting of the AAS, virtual (iPoster)
Jan. 2020	235th Meeting of the AAS, Honolulu, HI (poster)
Nov. 2019	Graduate Physics Society Annual Conference, University of Notre Dame (poster)
Sept. 2019	Midwest Workshop on Supernovae & Transients, Ohio State University (poster)
Apr. 2019	Graduate Physics Society Annual Conference, University of Notre Dame (talk)
Feb. 2019	Midwest Workshop on Supernovae & Transients, University of Chicago (talk)
Jan. 2019	233rd Meeting of the AAS, Seattle, WA (poster)
Dec. 2018	College of Science & Eng. Joint Annual Meeting, University of Notre Dame (talk)
Oct. 2018	AWIS Women in Science Regional Conference, University of Notre Dame (poster)
Jan. 2018	231st Meeting of the AAS, Washington, D.C. (poster)

Teaching Experience

Guest Lecturer Sept. 2022 - present
Iowa State University *Ames, Iowa*

- Covered lectures for the instructor of record, with slides provided. Four lectures total: 2 lectures for ASTRO 150 (Stars, Galaxies & Cosmology), 2 lectures for ASTRO 120 (The Sky and Our Solar System).

Physics Research Writing Consultant Aug. 2020 - May 2022
University of Notre Dame *South Bend, Indiana*

- Trained by the University Writing Center in general writing pedagogy principles and consulted on writing projects (scientific papers, theses, proposals, etc.) for any member of the Department of Physics & Astronomy (including professors, postdocs, visiting scholars, graduate & undergraduate students).

Instructor of Record for *Scientific Writing for the REU and Beyond*

July 2021

University of Notre Dame

South Bend, Indiana

- Designed & ran a shortened version of the Scientific Writing for Physicists graduate student course for visiting REU students. Covered planning & drafting methods, what makes a good scientific paper, how to make effective figures & tables, and more. The course culminates in a report of the student's summer research.

Physics Teaching Practicum

Aug. 2018 - May 2022

University of Notre Dame

South Bend, Indiana

- Covered six lectures for the instructors of record under observation of another instructor. Topic(s) to cover were discussed with the instructor of record, but lecture notes/materials are my own. Created a teaching portfolio including my lecture notes, feedback from the observers, self-reflections, and feedback from the students.
- Classes: Introduction to Astrophysics (3, undergraduate); Physics of Astrophysics (1, graduate/undergraduate); Scientific Writing (1, graduate); Descriptive Astronomy (1, undergraduate)

Graduate Teaching Assistant

Aug. 2016 - May 2022

University of Notre Dame

South Bend, Indiana

- **Descriptive Astronomy:** Ran the observatory, organized help sessions, proctored exams, re-wrote observing projects, graded assignments. Acted as lead TA for Fall 2017-Spring 2019 and Fall 2020 semesters where I coordinated the efforts of all the TAs for the class.
- **Modern Observational Techniques:** Graded assignments, created answer keys, ran observing sessions with the Sarah L. Krizmanich Telescope on campus.
- **Physics of Astrophysics:** Graded assignments, ran help sessions, and ran an observing session with the Sarah L. Krizmanich Telescope.
- **Lasers & Modern Optics:** Set up and tested lab materials/procedures, graded lab reports, proctored exams.

Advising Experience

Undergraduate Students

Jan. 2023 - present

George Nassif, Iowa State University

Aug. 2023 - present

Leah Newton, Iowa State University

Observing Experience

Large Binocular Telescope

~ 50 nights

MODS, PEPSI, LUCI, LBC

Mt. Graham, Arizona

Remote queue observing for OSURC member institutions using facility instruments.

W. M. Keck Observatory

1 night

DEIMOS, LRIS

Mauna Kea, Hawaii

Two half-nights of remote classical observing.

Cerro Tololo Interamerican Observatory

3 nights

0.9-m SMARTS telescope

Cerro Tololo, Chile

Three nights of classical observing on site.

Technical Skills

Data Analysis Methods	Photometry, difference imaging, maximum likelihood, Markov-Chain Monte Carlo
Programming Languages	Python, Git, L ^A T _E X, R, Mathematica, MATLAB, IDL, IRAF
Spoken Languages	English (native), Spanish (limited working proficiency), Italian (elementary)

Service & Broader Impacts

Service

Sept. 2023 - present	Code of Conduct Task Force, <i>Roman</i> Supernova PIT Collaboration
Aug. 2020 - May 2021	Graduate Physics Society Public Relations Chair, South Bend, IN
Aug. 2019 - May 2020	AWIS Physics Department Representative, South Bend, IN
Aug. 2018 - May 2020	Graduate Physics Society Executive Board, South Bend, IN

DEI

Jan. 2023	Getting into Graduate School CUWiP Panel, Iowa City, IA
June 2022	Warrior Scholar Project Writing Tutor, South Bend, IN
July 2021	Warrior Scholar Project Writing Tutor, South Bend, IN
Apr. 2018	Expanding Your Horizons, South Bend, IN

Lectures/Workshops

Dec. 2019	Our Universe Revealed, South Bend, IN
July 2019	Apollo 11 50th Anniversary Celebration, Mishawaka, IN
July 2019	JINA-CEE Art-2-Science Camp, South Bend, IN
Feb. 2019	Science Alive, South Bend, IN

Public Observing

Sept. 2023	Girl Scout Observing Night, Ames, IA
Mar. 2023	Boy Scout Campout, Boone, IA
Oct. 2022	Girl Scout Campout, Boone, IA
Oct. 2020	Mid-Autumn Festival Celebration, South Bend, IN (virtual)
Mar. 2020	Faculty Observing Night, South Bend, IN
Nov. 2019	Mercury Transit Event, South Bend, IN
Aug. 2019	Summertime Stargazing II, South Bend, IN
July 2019	Summertime Stargazing I, South Bend, IN
June 2018	Physics of Atomic Nuclei Camp Observing Night, South Bend, IN

References

- Dr. Peter Garnavich** University of Notre Dame, Professor of Physics
pgarnavi@nd.edu
- Dr. J. Christopher Howk** University of Notre Dame, Professor of Physics
jhowk@nd.edu
- Dr. Matthew Capdevielle** University of Notre Dame, University Writing Center Director
mcapdev1@nd.edu
- Dr. Stephen S. Lawrence** Hofstra University, Professor of Physics & Astronomy
stephen.s.lawrence@hofstra.edu
- Dr. Peter A. Milne** University of Arizona, Research Professor, Lecturer for Astronomy
pmilne@as.arizona.edu
- Dr. Joseph B. Jensen** Utah Valley University, Professor of Physics, Department Chair
jjensen@uvu.edu
- Dr. Daniel Scolnic** Duke University, Associate Professor of Physics
daniel.scolnic@duke.edu
- Dr. Mukremin Kilic** University of Oklahoma, Associate Professor of Physics
kilic@ou.edu