Andrew Couperus

Curriculum Vitae

Department of Astronomy
Smith College
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Professional Profile:
I am an observational astronomer and science communicator studying the activity of nearby small stars and its impacts on exoplanets. In addition to conducting astronomy research and teaching, I use the lens of astronomy to engage students and the public with climate change and sustainability topics.

Education

2018–2025 **PhD - Astronomy**, Georgia State University (GSU), Atlanta, GA.
Defended June 2025 | Research Adviser: Dr. Todd Henry
Thesis: *The Long-Term Stellar Activity Cycles and Magnetic Predictability of Nearby M Dwarfs*

2018–2020 **MS - Physics**, Georgia State University, Atlanta, GA.
Concentration in Astronomy | Research Adviser: Dr. Todd Henry

2014–2017 **BS - Physics (with Great Distinction)**, Clarkson University, Potsdam, NY.
Minor in Mathematics | Research Adviser: Dr. Joshua Thomas

Appointments

Jul 2025 - now **Visiting Assistant Professor of Astronomy**, Smith College, Northampton, MA.
– Member of the Five College Astronomy Department (FCAD)

ongoing **Research Affiliate**, REsearch Consortium On Nearby Stars (**RECONS** - recons.org).

2018-2025 **Graduate Research Assistant**, Georgia State University.

Professional Experience

Teaching

2025-now **Visiting Assistant Professor of Astronomy**, Smith College.
– Teaching five undergraduate courses over the 2025–2026 academic year, including (AST 100) *A Survey of the Universe*, (AST 235) *Introduction to Stellar Structure*, and the interdisciplinary (AST 214) *Astronomy & Public Policy*. Designing and delivering a new intermediate-level research-focused course, (AST 221) *Current Problems in Low-Mass Stars*.
– Emphasis on active learning, un-grading, inclusive teaching, and societally-relevant content.

2025 **Workshop Participant**, AAS #245, *Increasing Student Learning and Inclusion in Your Classroom: Strategies from the Faculty Teaching Institute*.

2018–2021 **Graduate Teaching Assistant**, Georgia State University.
– Taught 16 lab sections across eight semesters for undergraduate intro astronomy courses.
– Helped improve in-person lab activities and train new TAs.
– Completed online teaching training, developed new online lab materials, led online groups of new TAs, and helped coordinate transition to online lab teaching during the pandemic.

Research

2018–2025 **Graduate Research Assistant**, Georgia State University.
– Investigated nearby low-mass stars, particularly their stellar magnetic activity, activity evolution, long-term activity cycles, rotation, variability, X-ray emission, and multiplicity. Managed six observing campaigns obtaining short- and long-baseline optical photometry, optical spectroscopy, radial velocities, X-ray imaging, speckle imaging, and ground-based astrometry, alongside a large breadth of archival data sources including *Gaia*, *TESS*, *Kepler*, ZTF, ASAS-SN, and 2MASS.
– Co-advised undergraduate research student, Summer 2022.

2016–2017 **Undergraduate Research Assistant**, Clarkson University.
– Helped implement and calibration a new LHIRES III spectrograph at Reynolds Observatory.
– Completed spectral observations and analysis for ∼40 nights of data to refine orbital measurements of high-mass stellar binaries.

Observing

2025A **Canada-France-Hawai'i Telescope 3.6m**, Maunakea, Hawai'i.
3.6 hrs – Awarded snapshot time with the SPIRou spectropolarimetry instrument as Co-I.

2019–2025 **RECONS CTIO/SMARTS 0.9m Program Support**, La Serena, Chile.
– Regularly assisted photometric and astrometric observations and analysis for the RECONS multi-decade 0.9m program on nearby stars.
– Coordinated simultaneous observations with the SMARTS 0.9m and 1.5m for a targeted multi-messenger study.

2019–2023 **CTIO/SMARTS 0.9m**, La Serena, Chile.
68 nights – Experience carrying out multiple 12–20 night in-person observing runs.
– 36 nights awarded competitively from NOIRLab proposal 2023A-549259 as PI. Another 36 nights awarded competitively from NOIRLab proposals 2020A-0178 / 2020B-0031 / 2021A-0005 as PI, but lost due to the COVID-19 pandemic.

2019–2023 **CTIO/SMARTS 1.5m**, La Serena, Chile.
203 hrs – High-resolution spectral observations with the CHIRON echelle spectrograph through RECONS/GSU time.

2021–2022 **XMM-Newton**.
13 ksec – Awarded low-priority time from GO proposal ID 088170 as Co-I.

2020–2022 **Chandra X-ray Observatory**.
188 ksec – Awarded time from GO proposal ID 22200260 as Co-I.

2019 **Apache Point Observatory - ARC 3.5m**, Sunspot, NM.
3 half-nights – Trained with the high-resolution ARCES spectrograph.

2019 **Hard Labor Creek Observatory - Miller 0.61m**, Rutledge, GA.
3 nights – Collected photometric observations of a rotating asteroid.

2016–2017 **Reynolds Observatory - 12in Meade**, Potsdam, NY.
∼20 nights – Acquired optical spectra for a multi-institution project including citizen scientists.

Industry

2017–2018 **Customer Service Technician**, Frazer Computing, Canton, NY.
– Worked in a team-based technical environment to support software and characterize user bugs.

Publications

3 first-author (1 published, 1 submitted, 1 fully drafted), 7 co-authored

Fully drafted & in prep — **Andrew A. Couperus**, Todd J. Henry, Eliot H. Vrijmoet, et al., *The Solar Neighborhood. LVI. New Photometric Stellar Activity Cycles in Fully Convective M Dwarfs Reveal Cycle Periods Beyond Two Decades and an Occurrence Rate Above 5%*, drafted and in prep.

Submitted to AJ — **Andrew A. Couperus**, Todd J. Henry, Aman Kar, et al., *The Solar Neighborhood. LV. M Dwarf Twin Binaries — One in Five Twin Sibling Pairs Are Mismatched in Activity and/or Rotation*, submitted to AJ Oct. 2025, arXiv.2510.22093, ∼45 pages.

2025 — **Andrew A. Couperus**, Todd J. Henry, Rachel A. Osten, et al., *The Solar Neighborhood. LII. M Dwarf Twin Binaries — Presumed Identical Twins Appear Fraternal in Variability, Rotation, Hα, and X-rays*, AJ, 169, 41, available at ADS or AJ, 34 pages.

2024 — T.A. Rector, L. Barbier, **Andrew A. Couperus**, et al., *Climate Change Task Force Report for the American Astronomical Society*, arXiv, arXiv:2406.10451.
– Aided in AAS emissions assessment, membership climate survey, and writing of report.

2024 — Aman Kar, Todd J. Henry, **Andrew A. Couperus**, et al., *The Solar Neighborhood LI: A Variability Survey of Nearby M Dwarfs with Planets from Months to Decades with TESS and the CTIO/SMARTS 0.9 m Telescope*, AJ, 167, 196, doi:10.3847/1538-3881/ad2ddc.
– Aided development and guidance of project, some analysis codes, and writing of paper.

2022 — Wei-Chun Jao, **Andrew A. Couperus**, Eliot H. Vrijmoet, et al., *Estimating the Convective Turnover Time*, ApJ, 940, 145, doi:10.3847/1538-4357/ac9cd8.
– Aided discussions of project, interpretation of analysis, and writing of paper.

2021 — Joshua D. Thomas, Noel D. Richardson, J. J. Eldridge, ... [including **Andrew A. Couperus**], et al., *The orbit and stellar masses of the archetype colliding-wind binary WR 140*, MNRAS, 504, 5221, doi:10.1093/mnras/stab1181.
– Acquired many observations and processed a portion of the spectra for RV analyses.

2020 — Douglas R. Gies, Kathryn V. Lester, Luqian Wang, **Andrew A. Couperus**, et al., *Spectroscopic Detection of the Pre-White Dwarf Companion of Regulus*, ApJ, 902, 25, doi:10.3847/1538-4357/abb372.
– Aided preliminary RV analyses of the system.

2020 — Emily A. Gilbert, Thomas Barclay, Joshua E. Schlieder, ... [including **Andrew A. Couperus**], et al., *The First Habitable-zone Earth-sized Planet from TESS. I. Validation of the TOI-700 System*, AJ, 160, 116, doi:10.3847/1538-3881/aba4b2.
– Acquired absolute photometric observations to help validate the host star properties.

2018 — Rachel A. Johnson, Noel D. Richardson, Anthony F. J. Moffat, ... [including **Andrew A. Couperus**], et al., *An Updated Ephemeris for the Single-lined Orbit of the Supergiant μ Sagittarii*, RNAAS, 2, 138, doi:10.3847/2515-5172/aad6ed.
– Acquired many observations and processed a portion of the spectra for RV analyses.

Presentations

15 talks (3 invited), 5 posters

Talks

(invited) 2025 *The Magnetic Predictability and Long-Term Stellar Activity Cycles of Nearby M Dwarfs*.
| Five College Astronomy Department Colloquium

2025 *The Interconnection of Astronomy and Climate Change*.
| GSU Graduate Conference for Research, Scholarship, and Creative Activity #3

2025 *The AAS Climate Change Task Force Report*.
| AAS Meeting #245

2025 *The Magnetic Predictability and Stellar Activity Cycles of Nearby M Dwarfs*.
| AAS Meeting #245

2024 *Twin M Dwarfs Appear Both Fraternal and Identical in Activity and Rotation*.
| GSU Stellar Symposium

(invited) 2024 *Climate Change and the American Astronomical Society*.
| GSU Department Seminar

abstract 2024 *Seeing Double: Are Twin M Dwarfs Fraternal or Identical in Activity and Rotation*.
| AAS Meeting #243, 254.05

2023 *Seeing Double: Are Twin M Dwarfs Fraternal or Identical in Activity*.
| GSU Stellar Symposium

(invited) 2022 *Twinkle Twinkle Little Star ET Wonders How You Are*.
| STScI Special Seminar

2022 *M Dwarf Stellar Activity — A Coming-of-Age Story*.
| Clarkson University Summer Undergraduate Research Program

2022 *M Dwarf Stellar Activity — A Coming-of-Age Story*.
| GSU Galaxies to Gluons Summer Seminar Series

abstract 2022 *Stellar Cycles in Fully Convective M Dwarfs: Astronomy Beyond a Funding Cycle*.
| Skumanich Conference, id.29

2021 *Twinkle Twinkle Little Star ET Wonders How You Are*.
| GSU Undergraduate Research Program Summer Seminar Series

abstract 2020 *Characterizing M Dwarf Stellar Cycles with Two Decades of RECONS Data*.
| AAS Meeting #236, 319.01

2016 *Benchmarking of the Shelyak LHIRES III Spectrograph*.
| Clarkson SURE Conference

Posters

poster 2024 *Twin M Dwarfs Appear Both Fraternal and Identical in Activity and Rotation*.
| Cool Stars 22 Conference

abstract 2022 *The Long-Term Photometric Variability of Nearby M Dwarfs and Exoplanet Hosts*.
| AbSciCon2022 Conference

poster 2021 *Twinkle Twinkle Little Star: ET Wonders How You Are*.
| Cool Stars 20.5 Conference

abstract 2021 *Twinkle Twinkle Little Star: ET Wonders How You Are*.
| AAS Meeting #237, 141.04

2016 *The Science at Clarkson's Reynolds Observatory*.
| Astronomical Society of New York Conference

Awards & Funding (Total: $70,905)

2025 **$5,060**, NASA SCoPE Seed Grant Proposal (awarded but declined due to scheduling).
Engaging Children and Adults with (Exo) Planetary Astronomy at Local Libraries

2021–2024 **$65,845**, Smithsonian Astrophysical Observatory, Co-I, via Chandra prop. ID 22200260.
Fraternal or Identical? The Magnetic Properties of M Dwarf Twins

2025 **Outstanding Advanced Astronomy Graduate Student Award**, GSU.

2021 **Outstanding Junior Astronomy Graduate Student Award**, GSU.

2020 **Exceptional Department Service Award**, GSU.

2020 **Outstanding Astronomy Graduate Teaching Assistant Award**, GSU.

2020 **Honorable Mention**, NSF Graduate Research Fellowship Program.

2015–2017 **Presidential Scholar**, Five Semesters, Clarkson University.

2014–2017 **Clarkson Merit Scholarship**, Clarkson University.

2014 **College Academic Award in Engineering Individual Studies**, SUNY Canton.

Professional Service

2020–2025 **Graduate Student Mentor**, AstroPALs, GSU.
– Directly mentored 2 students, developed and led 5 focus group sessions and co-led several others, and regularly aided the Astronomy Peer Advising Leaders (AstroPALs) steering committee.

2023 **Astronomy Student Representative**, Department Graduate Committee, GSU.

2018–2022 **Stellar Journal Club Rotating Discussion Leader**, GSU.

2020 **Astro/Physics Graduate Student DEI Committee Member**, GSU.

(See *Climate Change Education, Action, & Service* for additional service items.)

Climate Change Education, Action, & Service

2025–present **Chair, Sustainability Committee**, American Astronomical Society (AAS).

2024–2025 **Member, Sustainability Committee**, AAS.

2021–present **Member**, Astronomers for Planet Earth (A4E), and A4E Education Working Group.

2022–2025 **Astronomy × Climate Change Guest Lecturer**, GSU.
– Taught guest lectures for 3 graduate and undergraduate astronomy classes to discuss content at the intersection of astronomy and climate change.
– Provided help for ∼10 others to include such content in their classes and research efforts.

2024 **Invited Speaker**, *Climate Change and the American Astronomical Society*, GSU.

2024 **Workshop Participant**, AAS #243, *Saving Astronomy Workshop: Light Pollution, Satellite Constellations, and Climate Change*.
– Worked with interdisciplinary professionals spanning architects to rocket scientists in order to develop action items for advancing light pollution and satellite contamination mitigation efforts.

2022–2024 **Climate Change Task Force Member**, AAS.
report – Helped assess AAS CO2 emissions, survey AAS membership regarding climate action, investigate virtual meeting methods, and write report with recommendations for AAS leadership.

2021 **Completed Climate Leadership Training**, The Climate Reality Project.

Public Outreach

article 2025 **S&T Magazine Focal Point Author**, November 2025 Issue, *A Flare in Real Time*.

2024–2025 **Volunteer Presenter** $\times 2$, Three Taverns Brewery: Astronomy Night Lecture Series.

2018–2025 **Open Night Assistant**, Hard Labor Creek Observatory, GSU.

2024 **Science Activity Leader**, John Lewis Elementary School STEM Night.

2021 & 2022 **GSU Committee Member and Activity Leader**, Atlanta Science Festival.

art 2021 **Science Partner**, Science.Art.Wonder, Georgia Institute of Technology.
– Collaborated to convey astronomy concepts with a digital artist.

2019 **Program Assistant**, Georgia Science Olympiad Regional Tournament, GSU.

2019 **Science Activity Leader**, Trip Elementary School Science Night.

2017 **Color Images of the Orion Nebula**, Reynolds Observatory, Clarkson University.
– Created new composite color images of the Orion Nebula for use in public engagement.

2016–2017 **Open Night Assistant**, Reynolds Observatory, Clarkson University.

Summer 2016 **Mentor & Program Aid**, IMPETUS High School Program, Clarkson University.

Technical skills

Proficient Python, Jupyter Notebooks, IRAF, LaTeX, Windows, Linux

Introductory IDL, Bash Scripting, C++, MATLAB

2012 Certified Microsoft Office Specialist in Word, PowerPoint, and Excel.

Professional References

1. Dr. Todd Henry, RECONS & Georgia State University, thenry88@gsu.edu
2. Dr. James Lowenthal, Smith College, jlowenth@smith.edu
3. Dr. Rachel Osten, STScI & Johns Hopkins University, osten@stsci.edu