

Curriculum Vitae – Rachael M. Roettenbacher

Contact Information

Yale Center for Astronomy and Astrophysics
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Education

University of Michigan , Ann Arbor, MI, USA	September 2011–April 2016
Ph.D. in Astronomy and Astrophysics	April 2016
Advisor: John D. Monnier	
<i>Shifting the Starspot Paradigm through Imaging Magnetic Structures and Evolution</i>	
M.S. in Astronomy and Astrophysics	December 2013
NASA/UNCF Harriet G. Jenkins Predoctoral Fellow	2011–2013
Lehigh University , Bethlehem, PA, USA	August 2008–May 2011
M.S. in Physics	January 2010
NASA/UNCF Harriet G. Jenkins Predoctoral Fellow	2010–2011
U.S. Dept. of Edu. Graduate Assistance in Areas of National Need Fellow	2008–2010
Ohio Wesleyan University , Delaware, OH, USA	August 2005–May 2008
B.A. in Astrophysics and Mathematics, <i>cum laude</i>	May 2008

Professional Appointments

Yale University , New Haven, CT, USA	September 2018–present
Heising-Simons Foundation 51 Pegasi b Prize Postdoctoral Fellow	2021–2024
Yale Center for Astronomy and Astrophysics Prize Postdoctoral Fellow	2018–2021
Stockholm University , Stockholm, Sweden	August 2016–July 2018
Postdoctoral Research Fellow	

Refereed Articles, First Author

10. **Roettenbacher, R. M.** *Invited Review*
2019, Contr. of the Astr. Obs. Skalnaté Pleso, Slovakia, 49, 97
“Interferometry with Meter-Class Telescopes”
9. **Roettenbacher, R. M.** & Vida, K.
2018, ApJ, 868, 3
“The connection between starspots and flares on main-sequence *Kepler* stars”
8. **Roettenbacher, R. M.** & Kane, S. R.
2017, ApJ, 851, 77
“The Stellar Activity of TRAPPIST-1 and Consequences for the Planetary Atmospheres”
7. **Roettenbacher, R. M.**, Monnier, J. D., Korhonen, H., +7 coauthors
2017, ApJ, 849, 120
“Contemporaneous imaging comparisons of the spotted giant σ Geminorum using interferometric, spectroscopic, and photometric data”
6. **Roettenbacher, R. M.**, Kane, S. R., Monnier, J. D., & Harmon, R. O.
2016, ApJ, 832, 207
“KOI-1003: A new spotted, eclipsing RS CVn binary in the *Kepler* field”
5. **Roettenbacher, R. M.**, Monnier, J. D., Korhonen, H. +12 coauthors
2016, *Nature*, 533, 217
“No Sun-like dynamo on the active star ζ Andromedae from starspot asymmetry”

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4. **Roettenbacher, R. M.**, Monnier, J. D., Fekel, F. C., +14 coauthors
2015, ApJ, 809, 159
“Detecting the Companions and Ellipsoidal Variations of RS CVn Primaries: II. *o* Draconis, a Candidate for Low-Mass Companion Ingestion”
3. **Roettenbacher, R. M.**, Monnier, J. D., Henry, G. W., +17 coauthors
2015, ApJ, 807, 23
“Detecting the Companions and Ellipsoidal Variations of RS CVn Primaries: I. σ Geminorum”
2. **Roettenbacher, R. M.**, Monnier, J. D., Harmon, R. O., Barclay, T., & Still, M.
2013, ApJ, 767, 60
“Imaging Starspot Evolution on Kepler Target KIC 5110407 Using Light-Curve Inversion”
1. **Roettenbacher, R. M.**, Harmon, R. O., Vutisalchavakul, N., & Henry, G. W.
2011, AJ, 141, 138
“A Study of Differential Rotation on II Pegasi via Photometric Starspot Imaging”

Soon to be submitted

Roettenbacher, R. M., Cabot, S. H. C., Fischer, D. A., *et al.*

“EXPRES III: Starspots of ϵ Eridani”

Roettenbacher, R. M., Harmon, R. O. & Monnier, J. D.

“Measuring Differential Rotation by Cross-correlating Reconstructed Stellar Surfaces”

Refereed Articles, Coauthor

20. Korhonen, H., **Roettenbacher, R. M.**, +8 coauthors
2021, A&A, 646, 6
“Observing the changing surface structures of σ Gem with SONG”
19. Cabot, S. H. C., **Roettenbacher, R. M.**, +4 coauthors
2021, AJ, 161, 26
“Searching for Planets around Active Stars: A Case Study of HD 101501”
18. Kane, S. R., **Roettenbacher, R. M.**, Unterborn, C. T., Foley, B. J., & Hill, M. L.
2020, PAJ, 1, 36
“Atmosphere Sustainability of LHS 3844b”
17. Gallenne, A. + 10 coauthors, **Roettenbacher, R. M.**, +1 coauthor
2019, A&A, 622, 164
“Multiplicity of Galactic Cepheids from long-baseline interferometry. IV. New detected companions from MIRC and PIONIER observations”
16. Gallenne, A. +13 coauthors, **Roettenbacher, R. M.**, +6 coauthors
2018, ApJ, 867, 121
“A geometrical 1% distance to the short-period binary Cepheid V1334 Cygni”
15. De Rosa, G. +75 coauthors, **Roettenbacher, R. M.**, +25 coauthors
2018, ApJ, 866, 133
“Velocity-resolved reverberation mapping of five bright Seyfert 1 galaxies”
14. Hoard, D. W., Howell, S. B., **Roettenbacher, R. M.**, +3 coauthors
2018, AJ, 156, 119
“Kepler, Spitzer, and Hubble observations of the variable white dwarf BOKS 53856: Non-uniform metal absorption in dark spots”
13. Vida, K. & **Roettenbacher, R. M.**
2018, A&A, 616, 163
“Finding flares in *Kepler* data using machine-learning tools”

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12. Schaefer, G. H., Cassan, A., Gallenne, A., & **Roettenbacher, R. M.**
2018, *Exp. Astron.*, 46, 421
“Interferometry in the Era of Time-Domain Astronomy”
11. Gardner, T., +13 coauthors, **Roettenbacher, R. M.**, +5 coauthors
2018, *ApJ*, 855, 1
“Precision orbit of δ Delphini and prospects for astrometric detection of exoplanets”
10. Hummel, C. A., Monnier, J. D., **Roettenbacher, R. M.**, +12 coauthors
2017, *ApJ*, 844, 115
“Orbital elements and stellar parameters of the active binary UX Arietis”
9. Kochukhov, O., +10 coauthors, **Roettenbacher, R. M.**, +1 coauthor
2017, *AN*, 338, 428
“Surface magnetism of cool stars”
8. Gallenne, A., +4 coauthors, **Roettenbacher, R. M.**, +8 coauthors
2016, *MNRAS*, 461, 1451
“Multiplicity of Galactic Cepheids from long-baseline interferometry. III. Constraints on the new spectroscopic companion of δ Cephei”
7. Gallenne, A., +7 coauthors, **Roettenbacher, R. M.**, +9 coauthors
2015, *A&A*, 579, 68
“Robust high-contrast companion detection from interferometric observations. The CANDID algorithm and an application to six binary Cepheids”
6. Schaefer, G. H., +24 coauthors, **Roettenbacher, R. M.**, +11 coauthors
2014, **Nature**, 515, 234
“The expanding fireball of Nova Delphini 2013”
5. White, T. R., +9 coauthors, **Roettenbacher, R. M.**, +10 coauthors
2013, *MNRAS*, 433, 1262
“Interferometric radii of bright Kepler stars with the CHARA Array: θ Cygni and 16 Cygni A and B”
4. Barclay, T., Still, M., Jenkins, J. M., Howell, S. B., & **Roettenbacher, R. M.**
2012, *MNRAS*, 422, 1219
“Serendipitous Kepler observations of a background dwarf nova of SU UMa type”
3. Napoli, V. J., McSwain, M. V., Marsh Boyer, A. N., & **Roettenbacher, R. M.**
2011, *PASP*, 123, 1262
“The Distance of the Gamma-ray Binary 1FGL J1018.6-5856”
2. McSwain, M. V., +7 coauthors, **Roettenbacher, R. M.**
2010, *AJ*, 139, 857
“Multiwavelength Observations of the Runaway Binary HD 15137”
1. Aragona, C., +3 coauthors, **Roettenbacher, R. M.**, +3 coauthors
2009, *ApJ*, 698, 514
“H α Emission Variability in the γ -ray Binary LS I +61 303”

Contributed Articles

11. **Roettenbacher, R. M.** *Invited Review*
2020, *SPIE*, 11446, 11446-8
“Imaging Stellar Surfaces”
10. Zhao, L., + 3 coauthors, **Roettenbacher, R. M.**, +1 coauthor
2020, *RNAAS*, 4, 9
“The EXPRES Stellar-signals Project. I. Description of Data”

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9. Ridgway, S., +7 coauthors, **Roettenbacher, R. M.**, +1 coauthor
2019, BAAS, 51g, 157
Astro2020 Decadal Survey APC white paper
“Revitalizing the Optical/Infrared Interferometry Community in the U.S.”
8. **Roettenbacher, R. M.**, Norris, R. P., Baron, F., +9 coauthors
2019, BAAS, 51c, 181
Astro2020 Decadal Survey science white paper
“High Angular Resolution Astronomy: Resolving Stellar Surface Features”
7. **Roettenbacher, R. M.**, Monnier, J. D., Che, X., +8 coauthors
2015, Proc. of Cambridge Workshop on Cool Stars, Stellar Systems and the Sun, 18, 907
“Pushing the (Convective) Envelope: Imaging Spotted Stellar Surfaces with Optical Interferometry”
6. **Roettenbacher, R. M.**, Monnier, J. D., & Harmon, R. O.
2015, Proc. of Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 18, 377
“Investigating the Flare Activity of the Spotted Kepler Star KIC 5110407”
5. **Roettenbacher, R. M.**, Monnier, J. D., Harmon, R. O., & Korhonen H.
2014, Proceedings IAU Symp., 302, 212
“The new age of spotted star research using Kepler and CHARA”
4. **Roettenbacher, R. M.** & McSwain, M. V.
2011, Proc. IAU Symp., 272, 545
“Light curves of the Be stars of NGC 3766”
3. Grundstrom, E. D., +6 coauthors, **Roettenbacher, R. M.**, +2 coauthors
2011, Proc. IAU Symp., 272, 290
“Spectroscopic H α and H γ survey of field Be stars: 2004-2009”
2. Grundstrom, E. D., +4 coauthors & **Roettenbacher, R. M.**
2011, Proc. Liège Astrophysical Colloquium, 80, 371
“Observations of Be Disk Building: Optical Spectra of NW Ser (HD 168797) over 35 days”
1. **Roettenbacher, R. M.**, Amouzou, E. C., & McSwain, M. V.
2010, Proc. IAU Symp., 266, 518
“Nonradial pulsations in the open cluster NGC 3766”

Other Articles

1. **Roettenbacher, R. M.**
2016, Aeon Magazine, ed. C. S. Powell
“How the face of a distant star reveals our place in the cosmos”

Selected Awards

- Heising-Simons Foundation 51 Pegasi b Prize Postdoctoral Fellowship, 2021–2024
- Yale Center for Astronomy and Astrophysics Prize Postdoctoral Fellowship, Yale Uni., 2018–2021
- Marie Skłodowska-Curie Individual Fellowship, European Research Council, 2018 (declined)
- Ralph B. Baldwin Prize in Astrophysics and Space Sciences, University of Michigan, 2018
- Olivier Chesneau Prize for the best PhD thesis in high-angular resolution astronomy, Observatoire de la Côte d’Azur/ESO, 2017
- ESO Postdoctoral Fellowship, 2016 (declined)
- NASA Harriet G. Jenkins Predoctoral Fellowship, NASA/UNCF Special Programs, 2010–2013
- Graduate Assistance for Areas of National Need (GAANN) Fellowship, U.S. Dept. of Edu., 2008–2010

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Selected Grants

- Heising-Simons Foundation 51 Pegasi b Prize Postdoctoral Fellowship, 2021–2024
- Yale Center for Astronomy and Astrophysics Postdoctoral Fellowship, 2018–2021
- Dahlmark Grant, Stockholm University, 2018
- Travel Grant, Exoclipse Conference, Boise State University, 2017
- Rackham Graduate Student Travel Grant (four), University of Michigan, 2011–2015
- Sigma Xi Grants-in-Aid of Research (two), Sigma Xi National Research Society, 2010 and 2014
- Rackham Graduate Student Research Grant (two), University of Michigan, 2012 and 2013
- Travel Grant (two), International Astronomical Union, 2009 and 2013
- *Kepler* Guest Observer Cycle 4 funding, 2012
- NASA/UNCF Special Programs Harriet G. Jenkins Predoctoral Fellowship, 2010–2013
- Travel Grant, American Astronomical Society, 2009
- Mihoko Yoshida-Dierolf Travel Award, Lehigh University, 2009

Leadership Activities

- Science Organizing Committee, 21st Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 21, 2020 (postponed to 2022 due to COVID-19)
- Science Organizing Committee, The Sharpest Eyes on the Sky: A 2020 vision for high angular resolution astronomy, 2020 (postponed to 2022 due to COVID-19)
- Science Organizing Committee, 20.5th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 21, virtual conference, 2021
- Science Program Committee, SPIE Astronomical Telescopes + Instrumentation, Optical and Infrared Interferometry and Imaging VII, virtual conference, 2020
- Science Organizing Committee, TESS Ninja 2 Collaborative Workshop, 2019
- Co-organizer of Cool Stars 20 splinter session (Know Thy Starspot, Know Thy Star), Boston, MA, USA, 2018
- Science Organizing Committee, 9th VLTI Summer School, Lisbon, Portugal, 2018
- Co-organizer, Visibility in Interferometry, promotion of underrepresented groups in interferometry, 2018–present
- Science Team and Working Group Member, Stellar Parameters and Images with a Cophased Array (SPICA), 6-beam visible combiner for the CHARA Array, 2018–present

Research Presentations

Seminars and Colloquia

- University of Wisconsin–Madison, Madison, WI, USA, 2021
- California Institute of Technology, Pasadena, CA, USA, 2021
- Center for Computational Astrophysics, Flatiron Institute, New York, NY, USA 2020
- Stars & Planets, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA, 2020
- Carnegie Institution of Washington, Washington, D.C., USA, 2020
- Center for Astrobiology, University of Arizona, Tucson, AZ, USA, 2020
- University of California–Riverside, Riverside, CA, USA, 2019
- Georgia State University, Atlanta, GA, USA, 2019
- Boston University, Boston, MA, USA, 2019
- Kavli Institute for Theoretical Physics, University of California–Santa Barbara, Santa Barbara, CA, USA, 2019
- American Museum of Natural History, New York City, NY, USA, 2019
- University of Delaware, Newark, DE, USA, 2019
- Konkoly Observatory of the Hungarian Academy of Sciences, Budapest, Hungary, 2019

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- Yale University, New Haven, CT, USA, 2018
- Newcastle University, Newcastle upon Tyne, United Kingdom, 2018
- NASA Goddard Space Flight Center, Greenbelt, MD, USA, 2018
- University of Oslo, Oslo, Norway, 2018
- University of Michigan, Ann Arbor, MI, USA, 2018 (Baldwin Prize lecture)
- University of Exeter, United Kingdom, 2018
- University of Chicago, Chicago, IL, USA, 2018
- Konkoly Observatory of the Hungarian Academy of Sciences, Budapest, Hungary, 2017
- Onsala Space Observatory, Chalmers University of Technology, Onsala, Sweden, 2017
- Uppsala University, Uppsala, Sweden, 2016
- Stockholm University, Stockholm, Sweden, 2016
- Vanderbilt University, Nashville, TN, USA, 2015
- Tuorla Observatory, University of Turku, Turku, Finland, 2015
- Radio & Geoastronomy Division, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA, 2015
- Ohio Wesleyan University, Delaware, OH, USA, 2014

Invited Conference Presentations

- CHARA Collaboration Meeting, virtual conference, 2021
- Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 21, Toulouse, France, 2020 (in Modelling Stellar Atmospheres: Advances Brought by Solar Know-How splinter; cancelled due to COVID-19)
- SPIE Astronomical Telescopes + Instrumentation, Optical and Infrared Interferometry and Imaging, Yokohama, Japan, 2020
- TASC5/KASC12 Workshop, Cambridge, MA, USA, 2019
- High Angular Resolution View of Stars splinter, AAS Meeting 233, Seattle, WA, USA, 2019
- Observing techniques, instrumentation, and science for metre-class telescopes II, Tatranská Lomnica, Slovakia, 2018
- ESO Workshop on Imaging of Stellar Surfaces, Garching, Germany, 2018
- The Physics of Evolved Stars II: the role of binarity, Nice, France, 2017 (Chesneau Prize lecture)
- Solar-Stellar Connections Workshop, Ann Arbor, MI, USA, 2015
- Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 18, Flagstaff, AZ, USA, 2014 (in Stellar Surfaces with High Spatial and Temporal Resolution splinter)

Selected Contributed Conference Presentations

- The Sharpest Eyes on the Sky: A 2020 vision for high angular resolution astronomy, Exeter, UK, 2020 (postponed due to COVID-19)
- AAS Meeting 235, Honolulu, HI, USA, 2020 (poster)
- 16th Potsdam Thinkshop: The Rotation Periods of Cool Stars, Potsdam, Germany, 2019 (talk)
- CHARA/NPOI Collaboration Meeting, Flagstaff, AZ, USA, 2019 (talk)
- AAS Meeting 233, Seattle, WA, USA, 2019 (poster)
- Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 20, Boston, MA, USA, 2018 (plenary talk)
- CHARA Collaboration Meeting, Paris, France, 2018 (talk)
- Astronomdagarna, Kiruna, Sweden, 2017 (talk)
- Exoclipse: Exploring New Worlds in the Shade, Boise, ID, USA, 2017 (talk)
- 14th Potsdam Thinkshop: Stellar Magnetism, Potsdam, Germany, 2017 (talk)
- IAU Symp. 328: Living Around Active Stars, Maresias, Brazil, 2016 (talk)
- CHARA Collaboration Meeting, Nice, France, 2016 (talk)

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- Magnetic Intermediate Mass Stars, Bagnères-di-Bigorre, France, 2016 (talk)
- AAS Meeting 227, Orlando, FL, USA, 2016 (dissertation talk)
- Focus Meeting 13: The Sun and Sunlike Stars, IAU General Assembly XXIX, Honolulu, HI, USA, 2015 (talk)
- CHARA Collaboration Meeting, Atlanta, GA, USA, 2015 (talk)
- Solarnet: Solar and Stellar Magnetic Activity, Palermo, Italy, 2015 (talk)
- AAS Meeting 225, Seattle, WA, USA, 2015 (poster)
- Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun 18, Flagstaff, AZ, USA, 2014 (poster)
- CHARA Collaboration Meeting, Ann Arbor, MI, USA, 2014 (talk)
- XXV Canary Islands Winter School of Astrophysics: Cosmic Magnetic Fields, La Laguna, Tenerife, Canary Islands, Spain, 2013 (talk)
- IAU Symp. 302: Magnetic Fields Throughout Stellar Evolution, Biarritz, Paris, 2013 (talk)
- CHARA/NPOI Collaboration Meeting, Flagstaff, AZ, USA, 2013 (talk)
- AAS Meeting 219, Austin, TX, USA, 2012 (talk)

Observing Experience

- 11 proposals (97 total nights), CHARA Array
- 3 proposals (44 hours, across 57 nights), CTIO SMARTS 1.3m
- 1 proposal (1 night), KPNO 4m
- 1 proposal (10 nights), MDM 2.4m and 1.3m

Teaching Experience

- **Center for Integration of Research, Teaching, and Learning (CIRTL) Network, Massive Open Online Course (MOOC)**, 2018
An Introduction to Evidence-Based Undergraduate STEM Teaching Completion certificate with distinction
- **Undergraduate Student Research Co-Advisor**, 2017–2019
Advising an undergraduate student on a project on stellar activity in the *Kepler* field.
Co-advising with B. T. Montet, University of Chicago
- **PhD Student Research Co-Advisor, Stockholm University**, 2017–2018
Advising a PhD student on a project on stellar activity and the solar-stellar connection.
- **Graduate Student Instructor Mentor, University of Michigan**, 2014–2015
Oversaw graduate student instructors for introductory astronomy classes.
Provided graduate student instructors with teaching guidance.
- **Graduate Student Instructor, University of Michigan**, Winter 2011
Taught introductory astrophysics laboratories (ASTRO 201).
- **Teaching Assistant, Lehigh University**, Fall 2009
Taught introductory physics recitation (PHY 11).
- **Teaching Assistant, Lehigh University**, Fall 2008
Taught introductory astronomy laboratories (PHY 8 & ASTR 8).

Service and Outreach Activities

- Referee for AAS Journals, A&A, PASP, and others, 2015–present
- Reviewer for NSF and NASA proposals, 2020–present
- Presenter for Astronomy on Tap New Haven, 2020
- Yale University Internal Palomar/Keck Observatory TAC, 2020A–B
- Co-organizer, Yale Astronomy & Astrophysics Colloquium Series, 2019–2020

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- Mentor, AstroSibs, Mentoring of Yale undergraduates majoring in astronomy, 2018–2020
- Attendee, Early Career Focus Session for the Decadal Survey for Astronomy & Astrophysics, 2018
- Stars and Planets Group Meeting creator and leader, Stockholm University, 2017–2018
- Participant for STEM Voices and Astronomisk Ungdom (Sweden) podcasts, 2017, 2019
- PhD candidate selection committee, Stockholm University, 2016
- Chambliss Award Judge for the AAS, 2016, 2019
- Astrocoffee Organizer, morning astro-ph discussion, 2013–2015
- University of Michigan Internal Magellan/MDM Observatory TAC, 2015A
- Local Organizing Committee, CHARA Collaboration Meeting, Ann Arbor, MI, USA, 2014
- University of Michigan Internal SWIFT TAC, 2014A