

Curriculum Vitae

Contact Information

Department of Astronomy
Stockholm University
AlbaNova University Center
106 91 Stockholm, Sweden

+46 (0)85 537 85 46
rachael@astro.su.se
rmroettenbacher.github.io

Education

University of Michigan , Ann Arbor, MI, USA	September 2011–April 2016
Ph.D. in Astronomy and Astrophysics	April 2016
M.S. in Astronomy and Astrophysics	December 2013
NASA/UNCF Harriet G. Jenkins Pre-doctoral Fellow	2011–2013
Lehigh University , Bethlehem, PA, USA	August 2008–May 2011
M.S. in Physics	January 2010
NASA/UNCF Harriet G. Jenkins Pre-doctoral 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 Appointment

Yale University , New Haven, CT, USA	September 2018–August 2021
YCAA Prize Postdoctoral Fellow	
Stockholm University , Stockholm, Sweden	August 2016–July 2018
Postdoctoral Research Fellow	

Refereed Articles, First Author

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”
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”

Refereed Articles, Coauthor

15. Vida, K. & **Roettenbacher, R. M.**
Submitted to A&A April 2018
“Finding flares in *Kepler* data using machine-learning tools”
14. Hoad, D. W., Howell, S. B., **Roettenbacher, R. M.**, +3 coauthors
Submitted to AAS Journals, February 2018, in revisions April 2018
“Kepler, Spitzer, and Hubble observations of the variable white dwarf BOKS 53856: Non-uniform metal absorption in dark spots”
13. De Rosa, G. +75 coauthors, **Roettenbacher, R. M.**, +25 coauthors
Submitted to AAS Journals, January 2018
“Velocity-resolved reverberation mapping of five bright Seyfert 1 galaxies”
12. Schaefer, G. H., Cassan, A., Gallenne, A., & **Roettenbacher, R. M.**
Accepted to Experimental Astronomy April 2018
“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

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

- Ralph B. Baldwin Prize in Astrophysics and Space Sciences, 2018
- Olivier Chesneau Prize for the best PhD thesis in high-angular resolution astronomy, Observatoire de la Côte d’Azur/ESO, 2017
- NASA Harriet G. Jenkins Pre-Doctoral Fellowship, NASA/UNCF Special Programs, 2010–2013
- Graduate Assistance for Areas of National Need (GAANN) Fellowship, U.S. Dept. of Edu., 2008–2010
- Faculty Scholarship, Ohio Wesleyan University, 2005–2008
- Dean’s List (all semesters), Ohio Wesleyan University, 2005–2008
- Outstanding Undergraduate Research Award, Society of Physics Students, 2008
- Finalist for Undergraduate Research Award, Vanderbilt University, 2008
- Rusk Prize for Excellence in Physics, Ohio Wesleyan University, 2008
- Research Experience for Undergraduates, Lehigh University, 2007
- Superior rating in Undergraduate Research, Sigma Xi National Research Society, 2006
- Summer Science Research Program, Ohio Wesleyan University, 2006
- Robert and Elizabeth Muller Award for Promise in Physics, Ohio Wesleyan University, 2006
- Florence Leas Prize in Mathematics, Ohio Wesleyan University, 2006

Selected Grants

- *Kepler* Guest Observer Cycle 4 funding, 2012
- Dahlmark Grant, Stockholm University, 2018
- Travel Grant, Exoclipse Conference, Boise State University, 2017
- Sigma Xi Grants-in-Aid of Research (two), Sigma Xi National Research Society, 2010 and 2014
- Rackham Graduate Student Travel Grant (four), University of Michigan, 2011–2015
- Rackham Graduate Student Research Grant (two), University of Michigan, 2012 and 2013
- Travel Grant (two), International Astronomical Union, 2009 and 2013
- Travel Grant, American Astronomical Society, 2009
- Mihoko Yoshida-Dierolf Travel Award, Lehigh University, 2009

Research Presentations

Invited Seminars and Colloquia

- University of Oslo, Oslo, Norway, 2018
- University of Michigan, Ann Arbor, MI, USA, 2018 (Baldwin Prize lecture)
- University of Exeter, Great Britain, 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

- 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)

Contributed Conference Presentations

- 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)
- 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)
- AAS Meeting 217, Seattle, WA, USA, 2011 (poster)
- IAU Symp. 272: Active OB Stars: Structure, Evolution, Mass Loss, and Critical Limits, Paris, France, 2010 (poster)
- IAU Working Group on Active B Stars, IAU General Assembly XXVII, Rio de Janeiro, Brazil, 2009 (talk)
- IAU Symp. 266: Star Clusters, IAU General Assembly XXVII, Rio de Janeiro, Brazil, 2009 (poster)
- AAS Meeting 213, Long Beach, CA, USA, 2009 (poster)
- International Conference for Physics Students, Kraków, Poland, 2008 (talk)
- Meeting of the Ohio-Region Section of the APS, Oxford, OH, USA, 2007 (poster)
- AAS Meeting 209, Seattle, WA, USA, 2007 (poster)
- Meeting of the Ohio-Region Section of the APS, Orrville, OH, USA, 2006 (poster)
- Sigma Xi Annual Meeting and Student Research Conference, Detroit, MI, USA, 2006 (poster)

Collaborative Visits

- University of Michigan, Dept. of Astronomy, January 2018, host: John D. Monnier
- University of Chicago, Dept. of Astronomy, January 2018, host: Benjamin Montet
- Konkoly Observatory of the Hungarian Academy of Sciences, October 2017, host: Krisztián Vida
- San Francisco State University, Dept. of Physics and Astronomy, February 2017, host: Stephen R. Kane
- University of Michigan, Dept. of Astronomy, January 2017, host: John D. Monnier
- University of Copenhagen, Dark Cosmology Centre, February 2016, host: Heidi Korhonen
- University of Turku, Dept. of Physics and Astronomy, February 2015, host: Heidi Korhonen
- Harvard University, Dept. of Astronomy, January 2015, host: John A. Johnson
- San Francisco State University, Dept. of Physics and Astronomy, August 2014, host: Stephen R. Kane
- NASA Exoplanet Science Institute/Jet Propulsion Laboratory, June–August 2013, internship as NASA Jenkins Fellow, host: Stephen R. Kane
- NASA Ames Research Center, *Kepler* Guest Observer Office, May–August 2011 and May–July 2012, internship as NASA Jenkins Fellow, host: Martin Still

Selected Observing Proposals

- **Roettenbacher, R. M.**, Monnier, J. D., & Harmon, R. O., 19 visits on CTIO SMARTS 1.3-m, 2017B NOAO

- “Photometric Imaging of the Spotted Star UX Ari”
- **Roettenbacher, R. M.**, Monnier, J. D., Korhonen, H., et al., 3 nights at CHARA, 2017B
“Imaging the Spotted, Active Giant of UX Ari with MIRC”
- **Roettenbacher, R. M.** & Monnier, J. D., 7 nights at CHARA, 2017A
“Imaging the Spotted RS CVn Variable TZ CrB”
- **Roettenbacher, R. M.**, Monnier, J. D., & Hummel, C., 13 nights at CHARA, 2016
“Imaging the Spotted Surfaces of UX Ari and TZ Tri with MIRC”
- **Roettenbacher, R. M.**, Monnier, J. D., & Mérand, A., 3 nights at CHARA, 2015-1
“Imaging Stellar Activity and Searching for Companions of 61 Cygni A and B”
- **Roettenbacher, R. M.**, Monnier, J. D., Baron, F., et al., 10 nights at CHARA, 2014
“Detecting the faint main-sequence companions of the spotted giants of RS CVn systems”
- Monnier, J. D., **Roettenbacher, R. M. (Science PI)**, & Harmon, R. O., targets, Cycle 5 *Kepler* Guest Observer Program (not observed due to reaction wheel failure)
“Extreme Starspots II”
- **Roettenbacher, R. M.**, Monnier, J. D., Che, X., et al., 18 nights at CHARA, 2013
“Resolving the Spotted Surface of ζ And with simultaneous interferometric, Doppler, and Photometric Imaging”
- **Roettenbacher, R. M.**, Monnier, J. D., & Korhonen, H., 18 visits on CTIO SMARTS 1.3-m, 2013B NOAO
“Resolving the Spotted Surface of ζ And with Simultaneous Interferometric, Doppler, and Photometric Imaging”
- **Roettenbacher, R. M.**, Monnier, J. D., & Harmon, R. O., 1 night at KPNO 4-m, 2013A NOAO
“Breaking the Inclination Degeneracy: Accurate Spot Modeling of Young Solar Analogs”
- **Roettenbacher, R. M.**, Monnier, J. D., Che, X., et al., 9 nights at CHARA, 2012-2
“Resolving the Spotted Surface of σ Gem with Simultaneous Interferometric, Doppler, and Photometric Imaging”
- **Roettenbacher, R. M.**, Monnier, J. D., Harmon, R. O., & Korhonen, H., 20 visits on CTIO SMARTS 1.3-m, 2012B NOAO
“Photometric Observations of σ Gem with Simultaneous Interferometric and Doppler Imaging”
- **Roettenbacher, R. M.**, Monnier, J. D., Che, X., & Korhonen, H., 13 nights at CHARA, 2012-1
“Resolving the spotted surfaces of o Dra and ϵ UMa with simultaneous interferometric and Doppler imaging”
- Monnier, J. D., **Roettenbacher, R. M. (Science PI)**, Harmon, R. O., & Barclay, T., targets and funding, Cycle 4 *Kepler* Guest Observer Program Observing Proposal
“Extreme Starspots”
- **Roettenbacher, R. M.**, Monnier, J. D., & Barclay, T., CCDS spectrograph for 4 nights on 2.4-m and 6 nights on 1.3-m, UM 2012A MDM Observing Proposal
“Obtaining Measures of $v \sin i$ for Spotted *Kepler* Targets”

Observing Experience

- Mount Wilson Observatory, CHARA Interferometer with the Michigan Infrared Combiner (MIRC/MIRC-X), 91 nights (2011–2017), and CLIMB, 3 nights (2014)
- Kitt Peak National Observatory, 4-m with Échelle spectrograph, 1 night (2013)
- MDM Observatory, 1.3-m with CCDs spectrograph and R4K imager, 19 nights (2012–2013)
- MDM Observatory, 2.4-m with CCDs spectrograph, 4 nights (2012)
- Cerro Tololo Inter-American Observatory, 0.9-m telescope, 28 nights (2009–2011)
- Kitt Peak National Observatory, 0.9-m Coudé Feed telescope, 7 nights (2008)

Service and Outreach

- Referee for ApJ, A&A, 2015–present
- Co-organizer of Cool Stars 20 splinter session (Know Thy Starspot, Know Thy Star), 2018
- Science Organizing Committee, 9th VLTI Summer School, Lisbon, Portugal, 2018
- Stars and Planets Group Meeting creator and leader, Stockholm University, 2017–2018
- Participant for STEM Voices and Astronomisk Ungdom (Sweden) podcasts, 2017
- PhD candidate selection committee, Stockholm University, 2016
- Chambliss Award Judge for the AAS, 2016
- 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, 2014
- University of Michigan Internal SWIFT TAC, 2014A

Teaching Experience

- **PhD Student Research Co-Advisor, Stockholm University, 2017–2018**
Advising a PhD student in a project on stellar activity and the solar-stellar connection.
- **Undergraduate Student Research Co-Advisor, Stockholm University, 2017–2018**
Advising an undergraduate student in a project on stellar activity in the *Kepler* field.
- **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).