

GARRETT EVAN SOMERS

CURRICULUM VITAE

VIDA Postdoctoral Fellow

Email: garrett.e.somers@vanderbilt.edu
Website: <http://www.garrettsomers.com>
Citizenship: United States of America

Department of Physics and Astronomy
 Vanderbilt University
 6402 Stevenson Center
 Nashville, TN 37235

Research Interests

My interests include pre-main-sequence stellar structure and evolution, stellar magnetism, rotation and mixing on the main sequence, and the physics of starspots.

Education

The Ohio State University <i>Adviser:</i> Marc Pinsonneault	Astronomy	Ph.D., 2016
The Ohio State University	Astronomy	M.S., 2014
University of California, San Diego	Physics	B.S. <i>Cum Laude</i> , 2011
University of California, San Diego	Applied Mathematics	B.S. <i>Cum Laude</i> , 2011

Positions Held

VIDA Postdoctoral Fellow, Vanderbilt University	2016–
Presidential Research Fellow, The Ohio State University	2015–2016
Astronomy Laboratory Instructor, The Ohio State University	2014–2015
Head Teaching Associate, The Ohio State University	2011–2015
NASA EarthKAM/MoonKAM Mission Planner, Sally Ride Science & UC San Diego	2010–2011

First Author Publications

7. Somers, G. et al. (four co-authors), “*M Dwarf Rotation from the K2 Young Clusters to the Field. I. A Mass-Rotation Correlation at 10 Myr*”, 2017, *The Astrophysical Journal*, 850, 134S
6. Somers, G., Stassun, K.G., “*A Measurement of Radius Inflation in the Pleiades and its Relation to Rotation and Lithium Depletion*”, 2017, *The Astronomical Journal*, 153, 101S
5. Somers, G., Pinsonneault, M.H., “*Lithium depletion is a strong test of core-envelope recoupling*”, 2016, *The Astrophysical Journal*, 829, 32S
4. Somers, G., Pinsonneault, M. H. “*Older and Colder: The Impact of Starspots on Pre-Main Sequence Stellar Evolution*”, 2015, *The Astrophysical Journal*, 807, 174
3. Somers, G., Pinsonneault, M. H. “*Rotation, inflation, and lithium in the Pleiades*”, 2015, *Monthly Notices of the Royal Astronomical Society*, 449, 4131S
2. Somers, G., Pinsonneault, M. H. “*A Tale of Two Anomalies: Depletion, Dispersion, and the Connection Between the Stellar Lithium Spread and Inflated Radii on the Pre-Main Sequence*”, 2014, *The Astrophysical Journal*, 790, 72
1. Somers, G., Mathur, S., Martini, P., Grier, C. J., Ferrarese, L. “*Discovery of a Large Population of Ultraluminous X-ray Sources in the Bulge-less Galaxies NGC 337 and ESO 501-23*”, 2013, *The Astrophysical Journal*, 777, 7

Honors and Awards

American Physical Society Outstanding Doctoral Thesis Award in Astrophysics	2017
Vanderbilt Initiative in Data-Intensive Astrophysics Fellowship	2016-
Ohio State Presidential Research Fellowship	2015-2016
AAS Rodger Doxsey Prize Winner (1 of 8 awarded for all 2016 dissertation talks)	2015
IAU 314 Student Travel Grant	2015
Phi Kappa Phi Honor Society	2013

Professional Service

- Lead organizer for the “Know Thy Starspot, Know Thy Star” splinter session at Cool Stars 20 in Boston, MA (July 2018)
- Referee for AAS Journals, Astronomy and Astrophysics
- Science consultant for Boriboricha Inc. publishing astronomy children’s books.

Selected Talks

16. *October 2018 Invited Colloquium*, “The influence of magnetic activity on the fundamental properties of cool stars”, Indiana University, Bloomington IN, USA
15. *October 2018 Invited Colloquium*, “The influence of magnetic activity on the fundamental properties of cool stars”, Georgia State University, Atlanta GA, USA
14. *October 2018 Coffee Seminar*, “The influence of magnetic activity on the fundamental properties of cool stars”, University of Hawaii, Manoa HI, USA
13. *July 2018 Contributed Talk*, “The influence of magnetic activity on the fundamental properties of cool stars”, Cool Stars 20, Boston MA, USA
12. *April 2018 Contributed Talk*, “The Influence of Starspots on the H-R diagram”, The 21st Century H-R Diagram at Space Telescope Science Institute, Baltimore MD, USA
11. *February 2018 Contributed Talk*, “Starspot demographics with APOGEE/MWM”, Milky Way Mapper Workshop, New York NY, USA
10. *September 2017 Invited Talk*, “Testing the accuracy of pre-main sequence stellar models with rotation, inflation, and lithium abundances”, L’isola d’Elba, Italy
9. *January 2017 DAP Dissertation Prize Invited Talk*, “Exploring Non-Standard Stellar Physics With Lithium Depletion”, April Meeting of the American Physical Society, Washington D.C., USA **Awarded APS Outstanding Doctoral Thesis Award in Astrophysics**
8. *September 2016 Invited Seminar*, “The Influence of Magnetic Activity on the Structure of Young Stars”, Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing, China
7. *July 2016 Dissertation Defense*, “Exploring Non-Standard Stellar Physics With Lithium Depletion”, The Ohio State University, Columbus OH, USA

6. *June 2016 Contributed Talk*, “Lithium depletion is a strong test of core-envelope recoupling”, The 19th Cambridge Workshop on Cool Stars, Uppsala, Sweden
5. *June 2016 Collaboration talk*, “Angular momentum and activity evolution in Pleiades and Praesepe”, K2 Young Clusters Meeting, Uppsala, Sweden
4. *January 2016 Invited Seminar*, “The impact of rotation and starspots on pre-main-sequence stellar evolution”, Vanderbilt University, Nashville TN, USA
3. *January 2016 Dissertation Talk*, “The Impact of Starspots on Stellar Masses, Ages, and Lithium During the Pre-Main Sequence”, 227th Meeting of the American Astronomical Society, Kissimmee, FL
2. *November 2015 Invited Seminar*, “The impact of rotation and starspots on pre-main-sequence stellar evolution”, Carnegie Observatory, Pasadena, CA
1. *May 2015 Contributed Talk*, “Older and Colder: The Impact of Starspots on Stellar Masses, Ages, and Lithium During the Pre-Main Sequence”, IAUS 314 - Young Stars and Planets Near The Sun

Other Refereed Publications

20. Abolfathi, B. et al. (326 additional co-authors including **Somers, G.**), “*The Fourteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the extended Baryon Oscillation Sky Survey and from the second phase of the Apache Point Observatory Galactic Evolution Experiment*”, 2018, The Astrophysical Journal Supplements, 235, 42A
19. Sandquist, E.L., et al. (eighteen additional co-authors, including **Somers, G.**), “*The K2 M67 Study: A curiously young star in an eclipsing binary in an old open cluster*”, 2018, The Astronomical Journal, 155, 152S
18. Oelkers, R.J., et al. (twelve additional co-authors including **Somers, G.**), “*Variability Properties of 4 Million Sources in the TESS Input Catalog Observed with the Kilodegree Extremely Little Telescope*”, 2018, The Astronomical Journal, 155, 39O
17. Ansdell, M, et al. (fifteen additional co-authors, including **Somers, G.**), “*Identification of Young Stellar Variables with KELT for K2 II: The Upper Scorpius Association*”, 2018, MNRAS, 473, 1231A
16. Tayar, J., **Somers, G.**, et al. (twenty-nine additional co-authors), “*The Correlation Between Mixing Length and Metallicity On The Giant Branch: Implications For Ages in the GAIA Era*”, 2017, The Astrophysical Journal, 840, 17T
15. Jaehnig, K., et al. (seven additional co-authors, including **Somers, G.**), “*IN-SYNC. VII. Evidence for a Decreasing Spectroscopic Binary Fraction (from 1 to 100 Myr) within the IN-SYNC Sample*”, 2017, The Astrophysical Journal, 851, 14J
14. Hinkel, N.R., et al. (eight additional co-authors, including **Somers, G.**), “*A Catalog of Stellar Unified Properties (CATSUP) for 955 FGK-Stars Within 30 pc*”, 2017, The Astrophysical Journal, 848, 34H
13. Rodriguez, J.E., et al. (fifteen additional co-authors, including **Somers, G.**), “*Identification of Young Stellar Variables with KELT for K2 I: Campaign 13 Taurus*”, 2017, The Astrophysical Journal, 848, 97R

12. Mathur, S., et al. (148 additional co-authors including **Somers, G.**), “*Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the Ultraviolet anomaly in NGC 5548 with X-Ray Spectroscopy*”, 2017, The Astrophysical Journal, 846, 55M
11. Blanton, M.R., et al. (352 additional co-authors including **Somers, G.**), “*Sloan Digital Sky Survey IV: Mapping the Milky Way, Nearby Galaxies and the Distant Universe*”, 2017, The Astronomical Journal, 154, 28
10. Fausnaugh, M.M., et al. (seventy-one additional co-authors including **Somers, G.**), “*Continuum Reverberation Mapping of the Accretion Disks in Two Seyfert 1 Galaxies*”, 2017, The Astrophysical Journal *accepted*
9. Fausnaugh, M.M., et al. (seventy additional co-authors including **Somers, G.**), “*Reverberation Mapping of Optical Emission Lines in Five Active Galaxies*”, 2017, The Astrophysical Journal, 840, 97F
8. Vega, L.D., et al. (four additional co-authors including **Somers, G.**), “*Evidence for Binarity and Possible Disk Obscuration in Kepler Observations of the Pulsating RV Tau Variable DF Cygni*”, 2017, The Astrophysical Journal, 839, 48
7. Gully-Santiago, M.A., et al. (fourteen additional co-authors including **Somers, G.**), “*Placing the Spotted T Tauri Star LkCa 4 on an HR Diagram*”, 2017, The Astrophysical Journal, 836, 200G
6. Pei, L., et al. (156 additional co-authors including **Somers, G.**), “*Space Telescope and Optical Reverberation Mapping Project. V. Optical Spectroscopic Campaign and Emission-Line Analysis for NGC 5548*”, 2017, The Astrophysical Journal, 153, 101S
5. SDSS Collaboration (338 co-authors including **Somers, G.**), “*The Thirteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey Mapping Nearby Galaxies at Apache Point Observatory*”, 2016 *in press*, arXiv 1608.02013
4. Rebull, L.M., et al. (eighteen additional co-authors including **Somers, G.**), “*Rotation in the Pleiades with K2: I. Data and First Results*”, 2016, The Astronomical Journal, 152, 113R
3. Rebull, L.M., et al. (seventeen additional co-authors including **Somers, G.**), “*Rotation in the Pleiades with K2: II. Multi-Period Stars*”, 2016, The Astronomical Journal, 152, 114R
2. Stauffer, J.R., et al. (seventeen additional co-authors including **Somers, G.**), “*Rotation in the Pleiades With K2: III. Speculations on Origins and Evolution*”, 2016, The Astronomical Journal, 152, 115S
1. Boesgaard, A.M., et al. (five additional co-authors including **Somers, G.**), “*Boron Abundances Across the “Li-Be Dip” in the Hyades*”, 2016, The Astrophysical Journal, 830, 49B

Submitted Publications

3. Shetrone, Matthew, et al. (fifteen co-authors including **Somers, Garrett**), “*Constraining metallicity dependent mixing and extra mixing using [C/N] in Alpha-rich field giants*”, 2018, AAS Journals *submitted*
2. Hinkel, Natalie; Unterborn, Cayman; Galvez, Richard; **Somers, Garrett**, *A Recommendation Algorithm to Predict Giant Exoplanet Host Stars Using Stellar Elemental Abundances*, 2018, Nature Astronomy *submitted*

1. De Rosa, G., et al. (102 additional co-authors including **Somers, G.**), “*Velocity-Resolved Reverberation Mapping of Five Bright Seyfert 1 Galaxies*”, 2017, The Astrophysical Journal *submitted*

Mentoring

- Research adviser to Laura D. Vega, a Vanderbilt graduate student currently in her 4th year. My mentoring includes assisting with long term research planning, helping with her current work and scientific writing, and general career and professional advice.
- Research adviser to Karl Jaehnig, a Vanderbilt graduate student currently in his 3rd year. We are working together on a project to measure the radii of stars in the Hyades as a way to test models of radius inflation.

Proposals and Grants

5. After Sloan IV (AS4) Survey
Co-Author: “Disco: The panoptic multi-million-star survey”, PI: Jonathan Bird and Melissa Ness, Duration: 10 years, Budget: \$2 million, **Awarded 2017**
4. TESS Guest Investigator – Cycle 1, 2017
PI: “Unveiling the connection between rotation and radius inflation with *TESS* and the *Hypatia Catalog*”, submitted, Duration: 1 year, Budget \$50,000
3. Vanderbilt Initiative in Data-Intensive Astrophysics Fellowship
PI: Awarded. Duration: 5 years, Budget: \$75,000
2. NASA Infrared Telescope Facility (IRTF) – Cycle 2017A
Co-I: “Spot properties of pre-main sequence photospheres w/ iSHELL spectroscopy”, PI: Kevin Covey, 15 nights, ~38.5 hours, **Awarded 2017**
1. NASA Infrared Telescope Facility (IRTF) – Cycle 2017B
Co-I: “Measuring accurate fundamental properties of young stars”, PI: Michael Gully-Santiago, 10 nights, ~50 hours, **Awarded 2017**

Outreach

- *August 2017*, Great American Eclipse informational talk, given to the department of alumni relations at Vanderbilt University.
- *2012-2015*, Organizer and presenter of numerous roof nights for Ohio State University students.

Selected Posters

6. *June 2017*, **Somers, G.**, *four others*, “Testing models of M dwarf angular momentum evolution with K2 young cluster rotation rates”, Kepler & K2 SciCon IV, Mountain View, CA.
5. *June 2016*, Tayar, J., **Somers, G.**, *twenty-six others*, “Asteroseismic tests of stellar isochrones”, The 19th Cambridge Workshop on Cool Stars, Uppsala, Sweden, **Best Graduate Student Poster award winner!**

4. *June 2016*, **Somers, G.**, Coker, C., & Pinsonneault, M.H., “Probes of Cosmic Variance in Open Clusters”, The 19th Cambridge Workshop on Cool Stars, Uppsala, Sweden
3. *January 2016*, Terndrup, D., **Somers, G.**, *two others* “Angular Momentum Evolution of Solar-type Stars and Implications for Gyrochronology”, 227th Meeting of the AAS, Kissimmee, FL
2. *November 2015*, Covey, K., *six others*, **Somers, G.** “Rotation Periods for Upper Sco Members from K2 Light Curves”, K2SciCon 1
1. *August 2014*, **Somers, G.** “Born Different: How Inflated Radii on the Pre-Main Sequence Inhibit the Depletion of Lithium”, Cool Stars 18

Conference Proceedings

2. **Somers, G.** “*Lithium Depletion Is A Strong Test Of Core-Envelope Recoupling*”, 2016, “19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun”, Uppsala, Sweden, Zenodo 58986
1. **Somers, G.**, Pinsonneault, M. H. “*The Impact of Starspots on Mass and Age Estimates During the Pre-Main Sequence*”, 2015, “Young Stars and Planets Near The Sun”, Proceedings of IAU Symposium No. 314

Research Videos

4. **Somers, G.** & Pinsonneault, M. H. 2015, M. H., “*Older and Colder: The impact of starspots on pre-main sequence stellar evolution*”, **Coffee Brief Video** (<https://www.youtube.com/watch?v=IA7WUeqIFug>)
3. **Somers, G.** & Pinsonneault, M. H. 2015, “*Rotation, inflation, and lithium in the Pleiades*”, **Coffee Brief Video** (<https://www.youtube.com/watch?v=pnXFBCRQgds>)
2. **Somers, G.** & Pinsonneault, M. H. 2014, “*A Tale of Two Anomalies: Depletion, Dispersion, and the Connection between the Stellar Lithium Spread and Inflated Radii on the Pre-main sequence*”, **Coffee Brief Video** (<https://www.youtube.com/watch?v=8576JQ0WkYM>)
1. **Somers, G.**, *et al* 2013, “*Discovery of a Large Population of Ultraluminous X-ray Sources in the Bulgeless Galaxies NGC 337 and ESO 501-23*”, **Coffee Brief Video** (<https://www.youtube.com/watch?v=5JnJC5ZqMpI>)

Relevant Experience

- Proficient in Fortran, Python
- Extensive experience modeling stellar evolution with the YREC and MESA evolution codes
- Have made numerous additions to the YREC code, including diffusion and starspot physics
- Usage of Vanderbilt supercomputer ACCRE for astrophysical computations.

- Twelve nights observing at the MDM 1.3 Meter Telescope at Kitt Peak

References

Keivan Stassun, Stevenson Professor of Physics and Astronomy
Vanderbilt University, Nashville, TN
keivan.stassun@vanderbilt.edu
Post-doc advisor

Marc Pinsonneault, Professor of Astronomy
The Ohio State University, Columbus, OH
pinsono@astronomy.ohio-state.edu
Graduate Advisor

Jennifer Johnson, Professor of Astronomy
The Ohio State University, Columbus, OH
jaj@astronomy.ohio-state.edu
Dissertation Committee Member