

Megan BEDELL, Ph.D.

RESEARCH INTERESTS: exoplanet discovery & characterization;
extreme precision radial velocity measurements;
stellar spectroscopy;
galactic archaeology;
astronomical data analysis

POSITION: Flatiron Research Fellow
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EDUCATION

UNIVERSITY OF CHICAGO	2012 - 2017
PhD in Astronomy & Astrophysics	
Dissertation Title: Illuminating the Origins of Planets with Solar Twins	
Advisor: Jacob L. Bean	
HAVERFORD COLLEGE	2008 - 2012
Graduated Magna Cum Laude	
B.S. with Honors in Physics and with Highest Honors in Astronomy	

HONORS & AWARDS

Josephine DeKarman Fellow	2016 - 2017
Lewis & Clark Field Scholar in Astrobiology	2016 - 2017
Illinois Space Grant Fellow	2016 - 2017
University of Chicago Harper Dissertation Fellow	2016 - 2017
NSF Graduate Research Fellow	2013 - 2016
Phi Beta Kappa	2012

GRANTS

Co-I, *"Improving the sensitivity of radial velocity spectrographs with data-driven techniques,"* funded through the NASA ADAP program for \$308k in FY2019-2021 (P.I. Bean).

Co-I, *"Performing The Most Comprehensive Exoplanet Survey Of The Southern Sky With TESS Full Frame Images,"* funded for \$200k as a TESS Guest Investigator large program in FY2019 (P.I. Montet).

PI, *"Precise Stellar Characterization as a Critical Test of TTV Mass Measurements,"* funded for \$15k as a NASA Keck program, 2017B.

PI, *"A transiting super-Earth around a solar twin with evidence for planet accretion?,"* funded for \$10k as a Priority 1 Spitzer Guest Observer program, Cycle 12 (2016).

OBSERVING TIME

Lead observer at ESO La Silla/HARPS	47 nights, 2013 - 2017
PI & lead observer at Keck/HIRES (NASA time)	4 half-nights, 2017
PI of NASA Spitzer program	15.4 hours, 2016
Observer at Keck/HIRES	2 half-nights, 2015
Observer at KPNO/WIYN 0.9m	3 nights, November 2011
Lead observer at Maria Mitchell Observatory/Loines 24-inch	40 nights, July - Sept. 2010

SELECTED INVITED SEMINARS

Princeton IAS, Seminar	September 2019
American Museum of Natural History, Colloquium	May 2019
Carnegie DTM, Colloquium	March 2019
Vanderbilt, Astro Seminar	April 2018
Harvard CfA, Stars & Planets Seminar	November 2016

SELECTED CONFERENCE PRESENTATIONS

Sagan Summer Workshop (invited talk)	July 2019
Gordon Research Conference on Origins of Solar Systems (invited talk)	June 2019
TESS Data Workshop (invited talk)	February 2019
Cool Stars 20 (contributed plenary talk)	August 2018
Know Thy Star, Know Thy Planet (contributed talk)	October 2017
Linking Exoplanet & Disk Compositions (contributed talk)	September 2016
Extreme Solar Systems III (contributed talk)	November 2015
Planet Signatures from Precision Spectroscopy (invited talk)	August 2015

TEACHING & MENTORSHIP

Research supervisor to Angus Beane, Flatiron CCA intern (1 publication resulting)	2018
Guest Lecturer, Columbia University	2018
Mentor, UChicago Women in Physics and Astronomy	2014 - 2016
Guest Lecturer, Universidade de São Paulo	2015
TA, University of Chicago	2012 - 2013

OUTREACH

TESS Roulette (https://tess.casino); 35000 pageviews	
Local organizer, NYC Dept of Education STEM Career Day	2018
Presenter, NYC Astronomy on Tap	2018
Co-founder, Chicago Astronomy on Tap	2016 - 2017
Presenter, Chicago Life Long Learning	2015 - 2017
Presenter, Adler Planetarium Space Visualization Lab	2014 - 2017
Public Observing Coordinator, Haverford College	2009 - 2012

OTHER PROFESSIONAL ACTIVITIES

Gaia-Kepler crossmatch database (https://gaia-kepler.fun); 2200 pageviews, used in 11 publications to date	
Science Organizing Committee, <i>Telluric Line Hack Week</i>	2019
Science Organizing Committee, <i>Building Early Science with TESS</i> workshop	2019
Science Organizing Committee, <i>TESS Preparatory Workshop</i>	2018
Time Allocation Committee, <i>Transiting Exoplanet Survey Satellite</i>	2017
Science Organizing Committee, <i>Precision Spectroscopy</i>	2017
Referee for AAS, MNRAS, A&A journals	2015 - present

PRESS

Interviewed for [NPR All Things Considered](#), [Nature](#), [PBS News Hour](#), [Scientific American](#).
“Next to its solar twins, the sun stands out,” Science News article, 2018.
“Astronomers discover dark past of planet-eating ‘Death Star,’” UChicago press release, 2016.
“Jupiter Twin Discovered Around Solar Twin,” ESO press release, 2015, covered by Associated Press, Discovery News, Space.com, and others.
“Oldest Solar Twin Identified,” ESO press release, 2013, covered by Science News, Space.com, and others.

REFEREED PAPERS

1. **Bedell, M.**, Hogg, D. W., Foreman-Mackey, D., et al. *wobble: a data-driven method for precision radial velocities*, AJ in review, [arXiv:1901.00503](https://arxiv.org/abs/1901.00503).
2. Carlos, M., Meléndez, J., Spina, L., et al. *The Li-age correlation: the Sun is unusually Li deficient for its age*, MNRAS in press.
3. Lorenzo de Oliveira, D., Meléndez, J., Galarza, J. Y., et al. *Constraining the evolution of stellar rotation using solar twins*, MNRAS in press.
4. Botelho, R. B., Milone, A. de C., Meléndez, J., et al. *Thorium in solar twins: implications for habitability in rocky planets*, 2019, MNRAS, 482, 1690.
5. Mingarelli, C. M. F., Anderson, L., **Bedell, M.**, et al. *Improving Binary Millisecond Pulsar Distances with Gaia*, 2019, [arXiv:1812.06262](https://arxiv.org/abs/1812.06262).
6. **Beane, A.**,¹ Ness, M., & **Bedell, M.**, *Actions are weak stellar age indicators in the Milky Way disk*, 2018, ApJ 867, 31.
7. Crossfield, I. J. M., Guerrero, N., David, T., et al., *A TESS Dress Rehearsal: Planetary Candidates and Variables from K2 Campaign 17*, 2018, ApJS 239, 5.
8. Lorenzo-Oliveira, D., Freitas, F. C., Meléndez, J., **Bedell, M.**, et al., *The Solar Twin Planet Search: The age - chromospheric activity relation*, 2018, A&A 619, A73.
9. Spina, L., Meléndez, J., Karakas, A. I., et al., *The temporal evolution of neutron-capture elements in the Galactic discs*, 2018, MNRAS 474, 2580.
10. **Bedell, M.**, Bean, J.L., Meléndez, J., et al., *The Chemical Homogeneity of Sun-like Stars in the Solar Neighborhood*, 2018, ApJ 865, 68.
11. dos Santos, L., Meléndez, J., **Bedell, M.**, et al., *Spectroscopic binaries in the Solar Twin Planet Search program: from substellar-mass to M dwarf companions*, 2017, MNRAS 472, 3425
12. Gandolfi, D., Barragán, O., Hatzes, A. P., et al., *The Transiting Multi-planet System HD 3167: A 5.7 M_E Super-Earth and an 8.3 M_E Mini-Neptune*, 2017, AJ 154, 123
13. **Bedell, M.**, Bean, J.L., Meléndez, J., et al., *Kepler-11 is a Solar Twin: Revising the Masses and Radii of Benchmark Planets via Precise Stellar Characterization*, 2017, ApJ 839, 94
14. Malik, M., Grosheintz, L., Mendonça, J. M., et al., *HELIOS: An Open-Source, GPU-Accelerated Radiative Transfer Code For Self-Consistent Exoplanetary Atmospheres*, 2017, AJ 153, 56
15. Meléndez, J., **Bedell, M.**, Bean, J.L., et al., *The Solar Twin Planet Search V. Close-in, low-mass planet candidates and evidence of planet accretion in the solar twin HIP 68468*, 2017, A&A 597, A34
16. Barragán, O., Grziwa, S., Gandolfi, D., et al., *EPIC 211391664b: A 32-M_J Neptune-sized planet in a 10-day orbit transiting an F8 star*, 2016, AJ 152, 193
17. dos Santos, L.A., Meléndez, J., do Nascimento, J.-D., Jr., **Bedell, M.**, et al., *The Solar Twin Planet Search IV. The Sun as a typical rotator and evidence for a new rotational braking law for Sun-like stars*, 2016, A&A 592, A156
18. Tucci Maia, M., Ramírez, I., Meléndez, J., **Bedell, M.**, et al., *The Solar Twin Planet Search III. The [Y/Mg] clock: estimating stellar ages of solar type stars*, 2016, A&A 590, A32
19. **Bedell, M.**, Meléndez, J., Bean, J.L., et al., *The Solar Twin Planet Search II. A Jupiter twin around a solar twin*, 2015, A&A 581, A34
20. **Bedell, M.**, Meléndez, J., Bean, J.L., et al., *Stellar Chemical Abundances: In Pursuit of the Highest Achievable Precision*, 2014, ApJ 795, 23
21. Ramírez, I., Meléndez, J., Bean, J.L., et al., *The Solar Twin Planet Search I. Fundamental parameters of the stellar sample*, 2014, A&A 572, A48

¹student advised by M.B.

22. Meléndez, J., Ramírez, I., Karakas, A., et al., *18 Sco: a solar twin rich in refractory and neutron-capture elements. Implications for chemical tagging*, 2014, ApJ 791, 14
23. Monroe, T., Meléndez, J., Ramírez, I., et al., *High Precision Abundances of the Old Solar Twin HIP 102152: Insights on Li Depletion from the Oldest Sun*, 2013, ApJ 773, L32
24. **Bedell, M.**, Villaume, A, et al., *Monitoring $H\alpha$ Emission and Continuum of UXORs: RR Tauri*, 2011, AJ 142, 164

INVITED REVIEWS

1. Meléndez, J., Bean, J. L., **Bedell, M.**, et al., 2015, The Messenger, 161, 28