Luke G. Bouma

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Research Interests

- The lives of exoplanets: formation, dynamics, evolution, observable properties, long-term fates.
- Exoplanet discovery and characterization.
- Physical and statistical interpretation of astronomical observations.

Education

- Princeton University — Princeton, NJ
  Ph.D, Astrophysics in progress; M.Sc, Astrophysics (2018). Advisor: Winn — *09/2016–08/2021*
- Massachusetts Institute of Technology — Cambridge, MA
  Physics Ph.D. program (transferred after completing first year). Advisor: Winn — *09/2015-08/2016*
- University of Southern California — Los Angeles, CA
  B.Sc, Physics; B.A, Mathematics; Minor, Astronomy (GPA: 3.97/4) — *09/2011-05/2015*

Publications

First & second author

7. Bouma, L., Winn, J., et al. *PTFO 8-8695: Two Stars, Two Signals, No Planet.* arXiv:2005.10253 (2020). AJ, accepted.
6. Bouma, L., Winn, J., et al. *WASP-4 is Accelerating Toward the Earth.* ApJL, 893, 2 (2020).
5. Bouma, L., Hartman, J., et al. *Cluster Difference Imaging Photometric Survey. I. Light Curves of Stars in Open Clusters from TESS Sectors 6 & 7.* ApJS, 245, 13 (2019).
4. Bouma, L., Winn, J., et al. *WASP-4b Arrived Early for the TESS Mission.* AJ, 157, 217 (2019).
3. Bouma, L., Masuda, K., Winn, J. *Biases in Planet Occurrence Caused by Unresolved Binaries in Transit Surveys.* AJ, 155, 244 (2018).
2. Penev, K., Bouma, L., et al. *Empirical Tidal Dissipation in Exoplanet Hosts From Tidal Spin-Up.* AJ, 155, 165 (2018).
1. Bouma, L. et al. *Planet-Detection Simulations for Several Possible TESS Extended Missions.* arXiv:1705.08891 (2017). Non-refereed white paper.

Many author

15. Patra, K. et al., incl. Bouma, L. *The Continuing Search For Evidence of Tidal Orbital Decay For Hot Jupiters.* AJ, 159, 150 (2020).
14. Jordán, A. et al., incl. Bouma, L. *TOI-677 b: A Warm Jupiter (P=11.2d) on an eccentric orbit transiting a late F-type star.* AJ, 159, 145 (2020).
13. Soares-Furtado, M. et al., incl. Bouma, L. *A Catalog of Periodic Variables in Open Clusters M 35 and NGC 2158.* ApJS, 246, 15 (2020).
12. Rodríguez Martínez, R. et al., incl. Bouma, L. *KELT-25b and KELT-26b: A Hot Jupiter and a Substellar Companion Transiting Young A-Stars Observed by TESS.* ApJS, 246, 15 (2020).
11. Netwon, E. et al., incl. Bouma, L. *TESS Hunt for Young and Maturing Exoplanets (THYME): A Planet in the 45 Myr Tucana-Horologium Association.* ApJL, 880, 1, L17 (2019).
10. Quinn, S. et al., incl. Bouma, L. *Near-resonance in a system of sub-Neptunes from TESS.* AJ, 158, 177 (2019).
9. Günther, M. et al., incl. Bouma, L. *A Super-Earth and two sub-Neptunes transiting the bright, nearby, and quiet M-dwarf TOI-270.* Nature Astronomy (2019).
8. Dawson, B. et al., incl. Bouma, L. *TOI-216b and TOI-216c: Two warm, large exoplanets in or slightly wide of the 2:1 orbital resonance.* AJ, 158, 65 (2019).

7. Shporer, A. et al., incl. Bouma, L. *TESS Full Orbital Phase Curve of the WASP-18b System.* AJ, 157, 178 (2019).
6. Zhan, Z. et al., incl. Bouma, L. *Complex Rotational Modulation of Rapidly Rotating M Stars Observed with TESS.* ApJ, 876, 127 (2019).
5. Rappaport, S. et al., incl. Bouma, L. *Deep long asymmetric occultation in EPIC 204376071.* MNRAS, 485, 2681 (2019).
4. Rodriguez, J. et al., incl. Bouma, L. *An Eccentric Massive Jupiter Orbiting a Sub-Giant on a 9.5 Day Period Discovered in the TESS Full Frame Images.* AJ, 157, 191 (2019).
3. Burt, J. et al., incl. Bouma, L. *Simulating the M-R Relation From APF Followup of TESS Targets: Survey Design and Strategies for Overcoming Mass Biases.* AJ, 156, 255 (2018).
2. Louie, D. et al., incl. Bouma, L. *Simulated JWST/NIRISS Transit Spectroscopy of Anticipated TESS Planets Compared to Select Discoveries from Space-Based and Ground-Based Surveys.* PASP 130d 4401 (2018).
1. Campante, T. et al., incl. Bouma, L. *The asteroseismic potential of TESS: Exoplanet-Host Stars.* ApJ, 830, 2 (2016).

Code

3. Bhatti, W. Bouma, L., and Yee S. `cdips-pipeline`*: difference-imaging photometry pipeline.* Link.
2. Bhatti, W. Bouma, L., and Wallace J. `astrobase`*: package for variable star astronomy.* Link.
1. Astropy Collaboration et al., incl. Bouma, L. *The Astropy Project.* AJ, 156, 123 (2018).

Selected Grants and Telescope Time Awarded

During my graduate studies, I helped conceive and write the grants that support my work on the Cluster Difference Imaging Photometric Survey (CDIPS). I also led the design and execution of photometric and spectroscopic follow-up programs to confirm planet candidates from this survey.

06/2020 PI: NOAO CTIO1.5m/CHIRON (4 nights); AAT/Veloce (2.5 nights).

05/2020 Co-I: TESS GI Program G03064 (PI: Hartman).

05/2020 PI: Magellan/PFS (2 nights; Princeton).

12/2019 Co-I: NOAO LCOGT 1 m and 2 m (PI: Hartman, 2020A-0005).

12/2019 PI: NOAO CTIO1.5m/CHIRON (3 nights); AAT/Veloce (2.5 nights).

11/2019 PI: Magellan/PFS (1 night; Princeton).

06/2019 Co-I: NOAO LCOGT 1 m and 2 m (PI: Hartman, 2019B-0160).

07/2019 Co-I: TESS GI Program G022117 (PI: Hartman).

07/2018 Co-I: TESS GI Program G011103 (PI: Hartman).

Selected Honors

2020-21 Charlotte Elizabeth Procter Fellowship *Competitive honorific for final-year Princeton Ph.D. students.*

05/2015 USC Discovery Scholar *University-level fellowship based on research portfolio towards graduate study.*

05/2014 Caltech Summer Undergraduate Research Fellowship

04/2014 Goldwater Scholarship *National fellowship for undergraduates pursuing careers in STEM.*

03/2014 ΦBK Honor Society

05/2013 NIST Summer Undergraduate Research Fellowship

2011-15 USC Trustee and University Scholarships *Full tuition award and merit stipend.*

05/2011 Valedictorian, Collège du Léman High School

Teaching

Teaching Assistant, AST 205 (Planets in the Universe), Princeton 09/2015-01/2016

Supplemental Instruction Leader, USC (Electromagnetism, Mechanics) 01-05/2013, 01-05/2014

Presentations

- *PTFO 8-8695: Two Stars, Two Signals, No Planet* 06/2020
  TESS Science Team Meeting #19 (Contributed talk).
- *Short-Period Giant Planets: Origins and Fates* 03/2020
  University of Chicago exoplanet group (Contributed talk).
- *Planets Around Other Stars* 03/2020
  Princeton Club of Chicago — Research on the Road Alumni Meeting (Invited talk).
- *TESS Planet Candidates in Open Clusters* 08/2019, 12/2019
  Extreme Solar Systems IV (Poster).
  TESS Science Team Meeting #18 (Contributed talk).
- *Homogeneous Light Curves for Stars in Clusters from TESS* 02/2019
  STScI TESS Data Workshop (Invited talk).
- *The Early Arrival of WASP-4b* 01/2019, 07/2019
  TESS Science Conference I (Contributed talk).
  Princeton Thunch Seminar (Contributed talk).
- *Extending the Planet Search with TESS* 10/2018
  TESS Science Team Meeting #16 (Contributed talk).
  TESS Science Conference I (Invited panel).
- *How do Unresolved Binaries Bias Transit Survey Occurrence Rates?* 06/2018
  Exoplanets II (Poster).
- *Planet-Detection Simulations for Several Possible TESS Extended Missions* 02/2016, 05/2016, 12/2016
  TESS Science Team Meetings #7, #8, #10 (3 contributed talks).
  NExScI Sagan Summer Workshop (Poster).

Service & Outreach

- **Resident Graduate Student**: Fall 2018 — present. Academic and social advisor to about 30 first and second year undergraduates. Hosted star-gazing nights, office hours, and social events.
- **Observing Outreach Organizer**: Fall 2016 — Fall 2019. Organized over 20 public observing events at Princeton's department telescope. Led outreach team to host groups ranging from 10 to 100 people; separately hosted private groups (*e.g.*, middle and high-school classes, student groups, and donors).
- **Computational Astrophysics Seminar Co-Founder & Organizer**: Jan 2017 — June 2018. With a team of two other students, proposed and received funding from Princeton's graduate student initiatives to run a seminar. Invited speakers, advertized events, and chaired talks.
- **Princeton Thunch Co-Organizer**: Jan 2017 — Dec 2017. Invited speakers; made hosting arrangements; chaired talks; developed new lunch delivery system.

Skills & Other Interests

- **Code**: Python (standard astro stack); cython; C++; bash. Projects at github.com/lgbouma.
- **Hobbies**: Rock climbing; percussion (kit drums); basketball; reading; camping; foosball