

Samuel H. C. Cabot

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RESEARCH OVERVIEW:

I am postdoctoral fellow at Peterhouse and a member of the Institute of Astronomy, University of Cambridge. My planetary science work concerns impact cratering and orbital dynamics in the Solar System, interstellar objects, and lunar exploration. My exoplanets work involves high-resolution atmospheric spectroscopy and probabilistic methods for radial velocity surveys.

RESEARCH APPOINTMENTS

University of Cambridge, Cambridge, UK 2023 – present
Junior Research Fellow, Peterhouse

EDUCATION

Yale University, New Haven, CT 2018 – 2023
PhD Astronomy
Advisors: Professor Debra Fischer, Professor Greg Laughlin

University of Cambridge, Cambridge, UK 2017 – 2018
MASt Astrophysics, *pass with merit*
Advisor: Professor Nikku Madhusudhan

Princeton University, Princeton, NJ 2013 – 2017
A.B. Astrophysical Sciences, *magna cum laude*; Certificate in Applications of Computing
Advisor: Professor Neta Bahcall

FELLOWSHIPS & AWARDS

- Yale University Astronomy Department, Tinsley Award for Best Graduate Student Paper 2021
 - Yale University, Nathan Hale Associates Fellow 2019
 - University of Cambridge Institute of Astronomy, Summer Studentship 2018
 - Elected to Sigma Xi Society 2017
 - Princeton University, Summer USRP 2014, 2015, 2016
 - University of Massachusetts Amherst, FCAD Summer REU 2011, 2012, 2013
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REFEREED PUBLICATIONS

First Author Publications

11. *High-resolution Spectroscopic Reconnaissance of a Temperate Sub-Neptune*
Cabot, S.; Madhusudhan, N.; Constantinou, S.; et al. [2024 ApJL 966L 10C](#)
10. *X-rays Trace the Volatile Content of Interstellar Objects*
Cabot, S.; Wang, Q.; Seligman, D. [2023 ApJ 956 121C](#)

Nature Astronomy Highlight, Yale University Press Release

9. *Identifying Interstellar Object Impact Craters*
Cabot, S.; Laughlin, G. 2022 PSJ 3 172
[Space.com Coverage](#)
8. *Stacked Periodograms as a Probe of Exoplanetary Populations*
Cabot, S.; Laughlin, G. 2022 AJ 163 206C
7. *TOI-1518b: A Misaligned Ultra-hot Jupiter with Iron in its Atmosphere*
Cabot, S.; Bello-Arufe, A.; Mendonça, J.; Tronsgaard, R.; et al. 2021 AJ 162 218C
[Featured in NASA Article](#)
6. *EXPRES II. Searching for Planets around Active Stars*
Cabot, S.; Roettenbacher R.; Henry, G.; Zhao, L.; et al. 2021 AJ 161 26C
5. *Lunar Exploration as a Probe of Ancient Venus*
Cabot, S.; Laughlin, G. 2020 PSJ 1 66C
[BBC Coverage](#), [Yale University Press Release](#)
4. *Detection of Neutral Atomic Species in the Ultra-hot Jupiter WASP-121b*
Cabot, S.; Madhusudhan, N.; Welbanks, L.; Piette, A.; Gandhi, S. 2020 MNRAS 494 1
[WASP Collaboration Coverage](#)
3. *Robustness of High-Resolution Exoplanet Spectroscopy*
Cabot, S.; Madhusudhan, N.; Hawker, G.; Gandhi, S. 2019 MNRAS 482 4
2. *C IV and He II Line Emission of Lyman α Blobs: Powered by Shock-Heated Gas*
Cabot, S.; Cen, R.; Zheng, Z. 2016 MNRAS 462 1
1. *XMM-Newton/RGS detection of the Missing Interstellar O VII $K\alpha$ Absorption Line*
Cabot, S.; Wang, Q.; Yao, Y. 2013 MNRAS 431 1

Second and Third Author Publications

10. *The Volatile C/O Ratio as a Tracer for Formation Locations of Interstellar Comets*
Seligman, D.; et al. (3rd author, **Cabot, S.**) 2022 PSJ 3 150S
9. *A Survey of Sodium Absorption in Ten Giant Exoplanets*
Langeveld, A.; et al. (3rd author, **Cabot, S.**) 2022 MNRAS 1544L
8. *Mining the Ultra-Hot Skies of HAT-P-70b*
Bello-Arufe, A.; et al. (2nd author, **Cabot, S.**) 2022 AJ 163 96B
7. *EXPRES. III. Revealing the Stellar Activity Radial Velocity Signature of ϵ Eridani*
Roettenbacher, R.; et al. (2nd author, **Cabot, S.**) 2022 AJ 163 19R
[Heising-Simons Coverage](#), [Yale University Press Release](#)
6. *Constraints on the Occurrence of 'Oumuamua-Like Objects*
Levine, W.; et al. (2nd author, **Cabot, S.**) 2021 ApJ 922 39L
5. *On the Spin Dynamics of Elongated Minor Bodies*
Seligman, D.; et al. (3rd author, **Cabot, S.**) 2021 ApJ 920 28S
4. *Assessing telluric correction methods for Na detections*
Langeveld, A.; et al. (3rd author, **Cabot, S.**) 2021 MNRAS 502 4392L
3. *Neutral Cr and V in the Atmosphere of Ultra-hot Jupiter WASP-121b*
Ben-Yami, M.; et al. (3rd author, **Cabot, S.**) 2020 ApJL, 897L, 5B
[AAS Nova Coverage](#)
2. *High-resolution Transmission Spectroscopy of MASCARA-2b with EXPRES*
Hoeijmakers, H.; et al. (2nd author, **Cabot, S.**) 2020 A&A 641A 120H
[Yale University Press Release](#)
1. *Evidence for Multiple Molecular Species in the Hot Jupiter HD 209458b*
Hawker, G.; et al. (3rd author **Cabot, S.**) 2018 ApJL 863 1

Other Co-Author Publications

10. *EXPRES. IV. Two Additional Planets Orbiting ρ Coronae Borealis*
Brewer, J.; et al. (co-author: **Cabot, S.**) [2023 AJ 166 46B](#)
9. *Multiepoch Detections of the Extended Atmosphere of KELT-9b*
Lowson, N.; et al. (co-author: **Cabot, S.**) [2023 AJ 165 101L](#)
8. *Transmission Spectroscopy of the Lowest-density Gas Giant*
Bello-Arufe, A.; et al. (co-author: **Cabot, S.**) [2023 AJ 166 69B](#)
[Calar Alto Observatory Press Release](#)
7. *Spin-Orbit Alignment of Ultra-Short-Period Super-Earth 55 Cancri e*
Zhao, L.; et al. (co-author: **Cabot, S.**) [2023 NatAs 7 198Z](#)
[CNN Coverage](#), [Yale University Press Release](#)
6. *The EXPRES Stellar-Signals Project II*
Zhao, L.; et al. (co-author: **Cabot, S.**) [2022 AJ 163 171Z](#)
5. *TOI-1431b/MASCARA-5b: A Highly Irradiated Ultra-Hot Jupiter*
Addison, B.; et al. (co-author: **Cabot, S.**) [2021 AJ 162 292A](#)
4. *The obliquity and atmosphere of the ultra-hot Jupiter TOI-1431b*
Stangret, M.; et al. (co-author: **Cabot, S.**) [2021 A&A 654A 73S](#)
3. *EXPRES I. HD 3651 an Ideal RV Benchmark*
Brewer, J.; et al. (co-author: **Cabot, S.**) [2020 AJ 160 67B](#)
2. *A Pipeline for the Extreme PRecision Spectrograph*
Petersburg, R.; et al. (co-author: **Cabot, S.**) [2020 AJ 159 197P](#)
1. *Performance Verification of the Extreme Precision Spectrograph*
Blackman, R.; et al. (co-author: **Cabot, S.**) [2020 AJ 159 238B](#)

MEDIA CONTRIBUTIONS & OTHER WORKS

4. *Ask Astro: The Ends of White Dwarfs, Neutron Stars, & Brown Dwarfs*
Cabot, S. (Contribution to June 2022 issue of [Astronomy Magazine](#))
3. *Digital Media in the Blue-Chip Art Sector*
Cabot, S. (April 2022 contribution to [Metaculus](#))
2. *Black Holes and Bright Ideas*
Madjedi, K.; **Cabot, S.**; Gatinel, D. (July 2020 cover feature of [The Ophthalmologist](#))
1. Undergraduate papers:
Where are the Missing Baryons? (senior thesis, 2017)
BPT Characterization of Star Forming Galaxies (junior paper, 2017)
Transverse Velocity Estimates of Q2237 + 0305: The Einstein Cross (junior paper, 2016)

SEMINARS, COLLOQUIA & CONFERENCE TALKS

Caltech, GPS Seminar Speaker: Extracting Data from Uncommunicative Worlds	2022
MIT, Planetary Lunch Seminar Speaker: Extracting Data from Uncommunicative Worlds	2022
Wesleyan University, CT Exoplanets Picnic: Extracting Data from Uncommunicative Worlds	2022
USRA/LPI, Ancient Venus Conference: Lunar Exploration as a Probe of Ancient Venus	2022
Harvard University, Exoplanet Lunch Speaker: Extracting Data from Uncommunicative Worlds	2022
STScI, Exoplanet Seminar Speaker: Extracting Data from Uncommunicative Worlds	2022
SwRI, Colloquium Speaker: The Ancient Solar System	2022
UCSC, Planetary Lunch Seminar Speaker: Extracting Data from Uncommunicative Worlds	2022
University of Arizona, Origins Seminar Speaker: Lunar Exploration and Impact Cratering	2022
Indiana University, Friday Lunch Seminar Speaker: Hidden Exoplanet Populations	2022

Bay Area Exoplanet Meeting #40 Speaker: Stacked Periodograms for Exoplanet Populations	2022
San Francisco State University Colloquium Speaker: Hidden Exoplanet Populations	2022
TESS Science Team Meeting #27 Speaker: Stacked Periodograms for Exoplanet Populations	2022
University of Chicago, Seminar Speaker: Lunar Exploration as a Probe of Ancient Venus	2021
TESS Science Team Meeting #24 Speaker: Detection of TOI-1518b and Fe in its Atmosphere	2021
University of Maryland, Seminar Speaker: Skies of a Scorching Planet	2020
Princeton University, Seminar Speaker: Lunar Exploration as a Probe of Ancient Venus	2020
Williams College, Guest Speaker: Where are the Missing Baryons?	2017

OBSERVING PROGRAMS

<i>The 100 Earths Project</i>	2018 – 2023
Member of radial velocity exoplanet survey team (P.I. Prof. Debra Fischer)	
Partnership with 4.3m Lowell Discovery Telescope (LDT)	
<i>Accounting for Stellar Activity with Interferometric Images</i>	2022A, 2022B
2.0 Nights Awarded on MIRC-X/CHARA Array, Co-I	
<i>A Comparative Study of the Atmospheres of Ultra-hot Jupiters</i>	2021B
1.8 Nights Awarded on CARMENES/Calar Alto Observatory, Co-I	
<i>Disentangling Stellar & Planet Signatures with First Interferometric Images of Sunlike Stars</i>	2021A
6.0 Nights Awarded on MIRC-X/CHARA Array, Co-I	

⇒ Extensive observing experience including 26 nights on EXPRES/LDT

⇒ Trained observer for HARPS/ESO La Silla 3.6m telescope

ADVISING & TEACHING

University of Cambridge Guest Lecturer	2024
Part II Topics in Astrophysics	
MPhil in Data Intensive Science	
Certificate of College Teaching Preparation (program offered by Yale University)	2022 – 2023
Teaching portfolio available upon request	
Advised undergraduate senior research project (K. Azar, Yale University)	2022
<i>Constraining Kepler-Multi Masses through N-body Simulation Stability Analyses</i>	
Yale University Teaching Fellow	2018 – 2020
ASTR 180 Introduction to Relativity and Black Holes	
ASTR 130 Origins & Search for Life in the Universe	
ASTR 160 Frontiers & Controversies in Astrophysics	
ASTR 130 Origins & Search for Life in the Universe	

PROFESSIONAL & DEPARTMENTAL SERVICE

NASA XRP Executive Secretary	
Prospective graduate student admissions interviewer, Yale Astronomy Department	2022
Co-coordinator for Yale Exoplanet Seminar	2018 – 2019
Referee	

OUTREACH

Presentation (Exoplanet Atmospheres) to Lexington High School, Lexington, MA
Presentation (Lunar Exploration as a Probe of Ancient Venus) to Lexington High School, Lexington, MA
Presentation, Tian Family Endowed Lecture Series at Berkshire School, Sheffield, MA
Live Webinar (Skies of a Scorching Planet), through Yale LFOP Planetarium, New Haven, CT
Telescope demo for Yale School of Management, through Yale LFOP Planetarium, New Haven, CT
Presentation (Gravity) to Pine Cobble middle school, Williamstown, MA
Presentation (Story of a Satellite) to Pine Cobble elementary school, Williamstown, MA
Telescope and planetarium presenter for public shows at Yale LFOP Planetarium, New Haven, CT
Presentation (The Universe) to senior citizens center, Sheffield, MA
Presentation (The Universe) to elementary school, Washington, D.C.
Presentations with supernova search team at various high schools, MA
