

David Charbonneau
Curriculum vitae (November 2017)

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Current and Previous Positions

Harvard University, Harvard College Professor (2016 - present)
Harvard University, Professor of Astronomy (2010 - present)
Harvard University, Associate Professor (2008-2009), Assistant Professor (2004-2007)
R. A. Millikan Postdoctoral Scholar in Astronomy, 2001-2004, Caltech

Education

Harvard University, A. M. (Astronomy, 1999), Ph. D. (Astronomy, 2001)
U. of Toronto, Honors B. Sc. with high distinction (Math, Physics, & Astronomy, 1996)

Summary of Research Interests

Detection and characterization of exoplanets with the goal of studying inhabited worlds;
development of novel observational methods in support of these efforts; stellar astrophysics
focusing on nearby solar and low-mass stars as planet hosts.

Selected Research and Service Activities

Current:

Principal Investigator, Opportunity M, John Templeton Foundation
Principal Investigator, MEarth Project to Detect Habitable Planets Orbiting Low-mass Stars
Principal Investigator, NASA Spitzer and Hubble Space Telescope Studies of Exoplanets
Principal Investigator, NASA K2 Guest Investigator Programs
co-Investigator, Transiting Exoplanet Survey Satellite (TESS), NASA Explorer Mission
Science Team co-I & Past President, HARPS-North High-precision Radial Velocity Spectrograph
Team Member, Harvard Origins of Life Initiative

Selection of Recently Completed:

Panel Member, WFIRST Independent External Technical/Management/Cost Review
Principal Investigator, Alien Earths Initiative, John Templeton Foundation
Participating Scientist and Member of Kepler Science Council, NASA Kepler Mission
Co-Principal Investigator, Trans-Atlantic Exoplanet Survey (TrES) Network
Deputy Principal Investigator, EPOCh Investigation, NASA EPOXI Mission of Opportunity
Member, Committee on the Status of Women in Astronomy, American Astronomical Society

Selected Honors and Awards

Member, National Academy of Sciences, elected 2017
Member, American Academy of Arts & Sciences, elected 2017
Blavatnik National Laureate, Physical Sciences and Engineering, 2016

The Raymond and Beverly Sackler Prize in the Physical Sciences, Tel Aviv University, 2012
Fannie Cox Prize for Excellence in Science Teaching, Harvard University, 2011
Alan T. Waterman Award, National Science Foundation, 2009
Scientist of the Year, Discover Magazine, 2007
David and Lucile Packard Fellowship for Science and Engineering, 2006 – 2011
NASA Exceptional Scientific Achievement Medal, 2006
Alfred P. Sloan Research Fellow, 2006 – 2008
Robert J. Trumpler Award for “PhD of unusual importance”, Astron Society of the Pacific, 2004
Bart J. Bok Prize in Astronomy, Harvard University, 2004
Fireman Award for PhD Thesis in Astronomy, Harvard University, 2000

Selected Named Lectureships

Hintze Lecturer, Oxford University, 2014
Sackler Lecturer, Leiden Observatory, 2013
Brinson Lecturer, University of Chicago, 2012
Hilldale Lecturer, University of Wisconsin – Madison, 2011
Rittenhouse Lecturer, University of Pennsylvania, 2011

Research Achievements with Corresponding Papers (190 Refereed Papers, 20600 Citations)

Discovery of First Transiting Exoplanet

Detection of Planetary Transits Across a Sun-like Star, Charbonneau, David; Brown, Timothy M.; Latham, David W.; Mayor, Michel, *The Astrophysical Journal*, 529, L45 (2000).

First Measurement of Exoplanet Atmosphere

Detection of an Extrasolar Planet Atmosphere, Charbonneau, David; Brown, Timothy M.; Noyes, Robert W.; Gilliland, Ronald L., *The Astrophysical Journal*, 568, 377 (2002).

First Planet Discovered by Small Aperture Wide-Field Transit Survey

TrES-1: The Transiting Planet of a Bright K0 V Star, Alonso, Roi; Brown, Timothy M.; Torres, Guillermo; Latham, David W.; et al., *The Astrophysical Journal*, 613, L153 (2004).

First Detection of Light from an Exoplanet

Detection of Thermal Emission from an Extrasolar Planet, Charbonneau, David; Allen, Lori E.; Megeath, S. Thomas; Torres, Guillermo; et al., *The Astrophysical Journal*, 626, 523 (2005).

First Map of an Exoplanet

A map of the day-night contrast of the extrasolar planet HD 189733b, Knutson, Heather A.; Charbonneau, David; Allen, Lori E.; et al., *Nature*, 447, 183 (2007).

Discovery of the Most Favorable Nearby, Small Planets for Atmospheric Characterization

1. *A super-Earth transiting a nearby low-mass star*, Charbonneau, David; Berta, Zachory K.; Irwin, Jonathan; et al., *Nature*, Volume 462, Issue 7275, pp. 891-894 (2009).

2. *A rocky planet transiting a nearby low-mass star*, Z. K. Berta-Thompson, J. Irwin, D. Charbonneau, E. Newton, J. A. Dittmann, et al. *Nature*, 527, 204 (2015).

3. *A temperate rocky super-Earth transiting a nearby cool star*, J. A. Dittmann, J. M. Irwin, D. Charbonneau, X. Bonfils, et al. *Nature*, 544, 333 (2017)

Discovery of First Earth-size Exoplanet

Two Earth-sized planets orbiting Kepler-20; Fressin, Francois; Torres, Guillermo; Rowe, Jason F.; Charbonneau, David; Rogers, Leslie A.; et al., *Nature*, 482, 195 (2012)

Occurrence Rate of Planets Orbiting Sun-like Stars

The False Positive Rate of Kepler and the Occurrence of Planets, Fressin, François; Torres, Guillermo; Charbonneau, David; et al., *The Astrophysical Journal*, 766, article id. 81 (2013).

Determination of the Frequency of Habitable Planets

The Occurrence Rate of Small Planets around Small Stars, Dressing, Courtney D.; Charbonneau, David, *The Astrophysical Journal*, Volume 767, Issue 1, article id. 95 (2013).

Precise Density Constraints on Terrestrial Exoplanets

The Mass of Kepler-93b and The Composition of Terrestrial Planets, Dressing, Courtney D.; Charbonneau, David; et al. *The Astrophysical Journal*, 800, article id. 135 (2015).

Teaching and Advising of Undergraduate & Graduate Students, and Postdoctoral Scholars

Director of Undergraduate Studies, Astrophysics, Harvard University (2008 – 2013)

Chair, Graduate Admissions Committee, Department of Astronomy, Harvard (2015+)

Course Head, Harvard University (past 5 years only)

- Astronomy 189, “Exoplanet Systems” (2015, 2016)
- Freshman Seminar 26i “The Astronomy Laboratory” (2012)
- Astronomy 16, "Stellar and Planetary Astronomy" (2012, 2013)
- Astronomy 98, "Research Tutorial in Astrophysics" (2015, 2017)
- Astronomy 99, "Senior Thesis in Astrophysics" (2012, 2015, 2016)

Advisor, previous and current PhD students:

- Current: Hannah Diamond-Lowe (3rd yr); Nicholas Mondrik (3rd yr); Juliana Garcia-Mejia (1st year); Kristo Ment (1st year)
- Elisabeth R. Newton (PhD 2016), “The Evolution of Rotation and Magnetism in Small Stars Near the Sun”
- Jason A. Dittmann (PhD 2016), “Distances, Masses, Radii, and Metallicities of the Small Stars in the Solar Neighborhood”
- Courtney D. Dressing (PhD 2014), “The Prevalence & Compositions of Small Exoplanets”
- Zachory K. Berta (PhD 2013), “Super-Earth and Sub-Neptune Exoplanets: a First Look from the MEarth Project”
- Sarah Ballard (PhD 2012), “In Pursuit of New Worlds: Searches for and Studies of Transiting Exoplanets from Three Space Based Observatories”
- Philip Nutzman (PhD 2010), “Transiting Exoplanets: Discovery from the Ground, Characterization from Space”
- Cullen H. Blake (PhD 2009), “Ultracool Dwarfs and Their Companions”

- Heather A. Knutson (PhD 2009), “Portraits of Distant Worlds: Characterizing the Atmospheres of Extrasolar Planets”
- Jonathan S. Devor (PhD 2008), "On the Development and Application of Automated Searches for Eclipsing Binaries"
- Francis T. O'Donovan (PhD 2007), “The Detection and Exploration of Planets from the Trans-Atlantic Exoplanet Survey”

Advisor, current and previous postdoctoral scholars:

Jacob Bean, Jayne Birkby, Christopher Burke, Jessie Christiansen, Francesca DeMeo, Jean-Michel Desert, Francois Fressin, Sara Gettel, Raphaelle Haywood, Jonathan Irwin, Laura Kreidberg, Laura Mayorga, Caroline Morley, Joseph Rodriguez, and Jennifer Winters.