

# Evan B. Bauer

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## Employment

2020–2024 CfA Fellow, Center for Astrophysics | Harvard & Smithsonian

2019–2020 Postdoctoral Scholar, Kavli Institute for Theoretical Physics, UC Santa Barbara

## Education

2013–2019 Ph.D. Physics, UC Santa Barbara

Advisor: Lars Bildsten

2009–2013 B.A. University Scholar, Baylor University

Summa Cum Laude, Phi Beta Kappa, Honors Scholar with Distinction

## Refereed Publications

26 total, 7 as first author, 2692 total citations, h-index 13 (ADS July 2022)

Publications on NASA ADS: [ADS Library](#)

ORCID: [0000-0002-4791-6724](https://orcid.org/0000-0002-4791-6724)

### First- and Second-Author Publications:

1. M. E. Caplan, **Evan B. Bauer**, and I. F. Freeman. *Accurate diffusion coefficients for dense white dwarf plasma mixtures*. MNRAS, 513:L52(5pp), June 2022
2. Thomas Kupfer, **Evan B. Bauer**, Jan van Roestel, Eric C. Bellm, Lars Bildsten, Jim Fuller, Thomas A. Prince, Ulrich Heber, and 7 co-authors. *Discovery of a Double-detonation Thermonuclear Supernova Progenitor*. ApJL, 925:L12(10pp), February 2022
3. **Evan B. Bauer**, Vedant Chandra, Ken J. Shen, and J. J. Hermes. *Masses of White Dwarf Binary Companions to Type Ia Supernovae Measured from Runaway Velocities*. ApJL, 923:L34(7pp), December 2021
4. **Evan B. Bauer** and Thomas Kupfer. *Phases of Mass Transfer from Hot Subdwarfs to White Dwarf Companions and Their Photometric Properties*. ApJ, 922:245(13pp), December 2021
5. Josiah Schwab and **Evan B. Bauer**. *The Final Fates of Close Hot Subdwarf-White Dwarf Binaries: Mergers Involving He/C/O White Dwarfs and the Formation of Unusual Giant Stars with C/O-Dominated Envelopes*. ApJ, 920:110(5pp), October 2021
6. **Evan B. Bauer**, Josiah Schwab, Lars Bildsten, and Sihao Cheng. *Multi-gigayear White Dwarf Cooling Delays from Clustering-enhanced Gravitational Sedimentation*. ApJ, 902:93(18pp), October 2020
7. Thomas Kupfer, **Evan B. Bauer**, Kevin B. Burdge, Jan van Roestel, Eric C. Bellm, Jim Fuller, JJ Hermes, Thomas R. Marsh, and 25 co-authors. *A New Class of Roche Lobe-filling Hot Subdwarf Binaries*. ApJL, 898:L25(9pp), July 2020
8. Thomas Kupfer, **Evan B. Bauer**, Thomas R. Marsh, Jan van Roestel, Eric C. Bellm, Kevin B. Burdge, Michael W. Coughlin, Jim Fuller, and 24 co-authors. *The First Ultracompact Roche Lobe-Filling Hot Subdwarf Binary*. ApJ, 891:45(15pp), March 2020

9. **Evan B. Bauer**, Christopher J. White, and Lars Bildsten. *Remnants of Subdwarf Helium Donor Stars Ejected from Close Binaries with Thermonuclear Supernovae*. *ApJ*, 887:68(10pp), December 2019
10. Thomas Kupfer, **Evan B. Bauer**, Kevin B. Burdge, Eric C. Bellm, Lars Bildsten, Jim Fuller, JJ Hermes, Shrinivas R. Kulkarni, and 17 co-authors. *A New Class of Large-amplitude Radial-mode Hot Subdwarf Pulsators*. *ApJL*, 878:L35(6pp), June 2019
11. **Evan B. Bauer** and Lars Bildsten. *Polluted White Dwarfs: Mixing Regions and Diffusion Timescales*. *ApJ*, 872:96(12pp), February 2019
12. **Evan B. Bauer** and Lars Bildsten. *Increases to Inferred Rates of Planetesimal Accretion due to Thermohaline Mixing in Metal-accreting White Dwarfs*. *ApJL*, 859:L19(6pp), June 2018
13. **Evan B. Bauer**, Josiah Schwab, and Lars Bildsten. *Electron Captures on  $^{14}\text{N}$  as a Trigger for Helium Shell Detonations*. *ApJ*, 845:97(8pp), August 2017

#### Other Publications:

- Vedant Chandra, Hsiang-Chih Hwang, Nadia L. Zakamska, Simon Blouin, Andrew Swan, Thomas R. Marsh, Ken J. Shen, Boris T. Gänsicke, J. J. Hermes, Odelia Putterman, **Evan B. Bauer**, and 4 co-authors. *The SN Ia runaway LP 398-9: detection of circumstellar material and surface rotation*. *MNRAS*, 512:6122(12pp), June 2022
- Vedant Chandra, Hsiang-Chih Hwang, Nadia L. Zakamska, Boris T. Gänsicke, J. J. Hermes, Axel Schwöpe, Carles Badenes, Gagik Tovmassian, **Evan B. Bauer**, and 6 co-authors. *A 99-minute Double-lined White Dwarf Binary from SDSS-V*. *ApJ*, 921:160(11pp), November 2021
- Adam S. Jermyn, Josiah Schwab, **Evan Bauer**, F. X. Timmes, and Alexander Y. Potekhin. *Skye: A Differentiable Equation of State*. *ApJ*, 913:72(20pp), May 2021
- Tim Cunningham, Pier-Emmanuel Tremblay, **Evan B. Bauer**, Odette Toloza, Elena Cukanovaite, Detlev Koester, Jay Farihi, Bernd Freytag, Boris T. Gänsicke, Hans-Günter Ludwig, and Dimitri Veras. *Horizontal spreading of planetary debris accreted by white dwarfs*. *MNRAS*, 503:1646(22pp), May 2021
- Morgan T. Chidester, F. X. Timmes, Josiah Schwab, Richard H. D. Townsend, Ebraheem Farag, Anne Thoul, C. E. Fields, **Evan B. Bauer**, and Michael H. Montgomery. *On the Impact of  $^{22}\text{Ne}$  on the Pulsation Periods of Carbon-Oxygen White Dwarfs with Helium-dominated Atmospheres*. *ApJ*, 910:24(17pp), March 2021
- Jeffrey K. Ratzloff, Thomas Kupfer, Brad N. Barlow, David Schneider, Thomas R. Marsh, Ulrich Heber, Kyle A. Corcoran, **Evan B. Bauer**, and 5 co-authors. *EVR-CB-004: An Inflated Hot Subdwarf O Star + Unseen WD Companion in a Compact Binary Discovered with the Evryscope*. *ApJ*, 902:92(18pp), October 2020
- Anna J. G. O'Grady, Maria R. Drout, B. J. Shappee, **Evan B. Bauer**, Jim Fuller, C. S. Kochanek, T. Jayasinghe, B. M. Gaensler, and 4 co-authors. *Cool, Luminous, and Highly Variable Stars in the Magellanic Clouds from ASAS-SN: Implications for Thorne-Żytkow Objects and Super-asymptotic Giant Branch Stars*. *ApJ*, 901:135(32pp), October 2020
- Jeffrey K. Ratzloff, Brad N. Barlow, Thomas Kupfer, Kyle A. Corcoran, Stephan Geier, **Evan B. Bauer**, Henry T. Corbett, Ward S. Howard, and 2 co-authors. *EVR-CB-001: An Evolving, Progenitor, White Dwarf Compact Binary Discovered with the Evryscope*. *ApJ*, 883:51(12pp), September 2019
- F. X. Timmes, Richard H. D. Townsend, **Evan B. Bauer**, Anne Thoul, C. E. Fields, and William M. Wolf. *The Impact of White Dwarf Luminosity Profiles on Oscillation Frequencies*. *ApJL*, 867:L30(6pp), November 2018
- Monika D. Soraisam, Lars Bildsten, Maria R. Drout, **Evan B. Bauer**, Marat Gilfanov, Thomas Kupfer, Russ R. Laher, Frank Masci, and 4 co-authors. *Variability of Red Supergiants in M31 from the Palomar Transient Factory*. *ApJ*, 859:73(14pp), May 2018
- Bill Paxton, Josiah Schwab, **Evan B. Bauer**, Lars Bildsten, Sergei Blinnikov, Paul Duffell, R. Farmer, Jared A. Goldberg, and 5 co-authors. *Modules for Experiments in Stellar Astrophysics (MESA): Convective Boundaries, Element Diffusion, and Massive Star Explosions*. *ApJS*, 234:34(50pp), February 2018
- Bill Paxton, Pablo Marchant, Josiah Schwab, **Evan B. Bauer**, Lars Bildsten, Matteo Cantiello, Luc Dessart, R. Farmer, and 5 co-authors. *Modules for Experiments in Stellar Astrophysics (MESA): Binaries, Pulsations, and Explosions*. *ApJS*, 220:15(44pp), September 2015

## Invited Talks

White Dwarf Pollution: The Key to Exoplanet Interiors.

*CfA Summer Lunch Seminar*. Harvard & Smithsonian. July 2022

Binary Hot Subdwarf + White Dwarf Systems as Progenitors for AM CVn Systems.

*10th Meeting on Hot Subdwarfs and Related Objects*. University of Liège, Liège, Belgium. June 13–17, 2022

Mass Estimates for Hypervelocity Runaways from Thermonuclear Supernovae.

*Harvard ITC Luncheon*, March 2022

Runaway Stars and What They Tell Us about Thermonuclear Supernovae.

*UMass Dartmouth Physics Seminar*, December 2021

Discovering a Large Potential Population of Hot Subdwarfs in the Galactic Plane.

*sdOB9.5, Breaking News*. University of Potsdam, Potsdam, Germany. August 16–18, 2021

What's going on with white dwarf cooling?

*University of Warwick Astronomy Seminar*, April 2021

The Q Branch: Where White Dwarfs Stop Cooling. (with Sihao Cheng)

*White Dwarfs from Physics to Astrophysics*.

Kavli Institute for Theoretical Physics (Virtual). March 29–30, 2021

Runaway Subdwarfs and White Dwarfs from Thermonuclear Supernovae.

*Harvard ITC Colloquium*, November 2020

Compositions and Accretion Rates of Planetary Debris: Implications of Thermohaline Mixing.

*UCLA Astronomy & Astrophysics Tuesday Lunch Talk*, March 2020

Betelgeuse, Betelgeuse, Betelgeuse: Is it about to explode? (with Jared Goldberg)

*Astronomy on Tap Santa Barbara*, February 2020

White Dwarfs, Runaway Stars, and Thermonuclear Supernovae.

*Los Alamos National Lab Astrophysics Seminar*, January 2020

Thermonuclear Supernovae and White Dwarf Pollution.

*IAU Symposium 357: White Dwarfs as Probes of Fundamental Physics*. Hilo, HI. October 21–25, 2019

Remnants of Donor Stars Ejected from Close Binaries with Thermonuclear Supernovae.

*Stars in the Run II*. University of Potsdam, Potsdam, Germany. August 25–30, 2019

Runaway White Dwarfs after Shocks from Supernova Ejecta.

*The Beginnings and Ends of Double White Dwarfs*. Copenhagen, Denmark. July 1–5, 2019

Binary Mass Transfer and the Growth of Helium White Dwarfs.

*9th Meeting on Hot Subdwarfs and Related Objects*. Hendaye, France. June 23–28, 2019

Shocking Simulations of Type Ia Supernova Companions.

*UC Santa Barbara Astro Lunch*, May 2019

White Dwarf Pollution and Surface Mixing.

*Institute for Advanced Study / Princeton University Bahcall Lunch*, December 2018

White Dwarfs and Their Neighbors: From Exoplanets to Explosions.

*UC Berkeley TAC Explosive Astrophysics Lunch*, October 2018

White Dwarfs and Their Neighbors: From Exoplanets to Explosions.  
*Caltech TAPIR Seminar*, October 2018

Mixing Disrupted Planetesimals into White Dwarf Surfaces.  
*Harvard-Smithsonian CfA Stars and Planets Seminar*, October 2018

Thermohaline Mixing in Polluted White Dwarfs.  
*Cambridge DAMTP Astrophysics Seminar*, October 2018

Diffusion and Other Mixing for Pollution Inferences in White Dwarfs.  
*21st European White Dwarf Workshop*. University of Texas, Austin, TX. July 23–27, 2018

Mixing Disrupted Planetesimals into White Dwarf Surfaces.  
*UC Santa Cruz FLASH Seminar*, June 2018

Thermohaline Mixing in Polluted White Dwarfs.  
*UC Santa Barbara Astro Lunch*, April 2018

How to Make a Star Explode Using Nitrogen.  
*UC Santa Cruz Transient Lunch*, May 2017

Nitrogen as a Trigger for Helium Shell Ignition.  
*UC Santa Barbara Astro Lunch*, April 2017

Thermonuclear Supernovae from Helium Accumulation and Detonation on White Dwarfs.  
 (with Lars Bildsten)  
*Frontiers in Nuclear Physics (KITP Program)*, October 2016

Accretion and Diffusion of Metals on Cold DB White Dwarfs.  
*20th European White Dwarf Workshop*. University of Warwick, Coventry, UK. July 25–29, 2016

## Professional Service

Subject-matter expert reviewer in a NASA peer review. 2022

Seminar Organizer, *CfA Seminar Series*. 2021–2022

Journal Referee

*Astronomy & Astrophysics*

*The Astrophysical Journal*

*Monthly Notices of the Royal Astronomical Society*

MESA Summer School. UCSB, Santa Barbara, CA.

Organization and Planning Committee, 2022

Teaching Assistant:

- Aaron Dotter, Ilaria Caiazzo, and Evan B. Bauer.  
*How to not Make Red Giants*. August 12–16, 2019
- Lars Bildsten, Jared A. Goldberg, and Evan B. Bauer.  
*The Onset of Full Convection on the Lower Main Sequence*. August 13–17, 2018
- Lars Bildsten, Evan B. Bauer, and William M. Wolf.  
*Gravitational Contraction of Low-Mass Fully Convective Objects*. August 14–18, 2017

- Conny Aerts, Timothy Van Reeth, and Evan B. Bauer.  
*Gravity-Mode Oscillations of Massive Stars*. August 15–19, 2016
- Lars Bildsten, Evan B. Bauer, and Monique Windju.  
*Particle Diffusion*. August 10–14, 2015

## Teaching Experience

Teaching Assistant, UC Santa Barbara

PHYS 232, Stellar Structure and Evolution (Graduate), Spring 2018

PHYS 132, Stellar Structure and Evolution, Fall 2016

PHYS CS 36, Quantum Physics (College of Creative Studies), Spring 2015

PHYS CS 35, Electromagnetism and Optics (College of Creative Studies), Winter 2015

PHYS CS 34, Electromagnetism (College of Creative Studies), Fall 2014

PHYS 43/RGST 43, Origins: A Dialogue Between Scientists and Humanists, Spring 2014

Lab Instructor, UC Santa Barbara

PHYS 6BL, Introductory Experimental Physics, Spring 2014

PHYS 6AL, Introductory Experimental Physics, Winter 2014

PHYS 3L, Physics Laboratory, Fall 2013

## References (contact information available upon request)

Lars Bildsten, Kavli Institute for Theoretical Physics, UC Santa Barbara

Charlie Conroy, Harvard University

Warren Brown, Smithsonian Astrophysical Observatory

Boris Gänsicke, University of Warwick

Frank Timmes, Arizona State University