

Josiah Schwab

Curriculum Vitae

Department of Astronomy & Astrophysics
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Santa Cruz, CA 95064
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Academic Positions

Sep. 2016– **Hubble Fellow**, *University of California, Santa Cruz, Santa Cruz, CA.*
Faculty Host: Enrico Ramirez-Ruiz

Education

2009–2016 **Ph.D. in Physics**, *University of California, Berkeley, Berkeley, CA.*
Advisor: Eliot Quataert

2005–2009 **S.B. in Physics**, *Massachusetts Institute of Technology, Cambridge, MA.*
Advisor: Saul Rappaport

Publication Summary

29 refereed publications (10 first-author, 9 second-author) + 3 in preparation

Individual Awards

- 2016–2019 Hubble Fellow (National Award)
- 2018 Finalist, APS Division of Astrophysics Thesis Award (National Award)
- 2017 Best Poster, Deciphering the Violent Universe (Conference Award)
- 2016 Mary Elizabeth Uhl Prize (Departmental Award)
- 2010–2015 NSF Graduate Research Fellow (National Award)
- 2009–2010 Sessler Fellowship (Departmental Award)
- 2009–2010 Outstanding Graduate Student Instructor (Departmental Award)
- 2009 Alan H. Barrett Prize for Excellence in Astrophysics (Departmental Award)
- 2005 Presidential Scholar (National Award)

Group Awards

- 2012–2015 APS Award for Improving Undergraduate Physics Education (National Award)
As member of The Compass Project at UC Berkeley

Meetings Organized

- Jul. 2019 *The Beginnings and Ends of Double White Dwarfs*, Copenhagen, DK
- May 2019 *Electron-Capture-Induced Stellar Collapse*, Lorentz Center, Leiden, NL

Invited Presentations

- Sep. 2018 Talk, *Hydrogen Deficient Stars*
- Apr. 2018 Talk, *APS April Meeting*
- Feb. 2018 Talk, *Observational Signatures of Type Ia Supernova Progenitors III*
- Sep. 2017 Talk, *The Dynamic Infrared Sky*
- May 2017 CGCA Seminar, *University of Wisconsin, Milwaukee*
- Nov. 2015 CCAPP Seminar, *The Ohio State University*
- Nov. 2015 FLASH Seminar, *University of California, Santa Cruz*
- Nov. 2015 ITC Seminar, *Harvard University*
- Oct. 2015 Astronomy Seminar, *Columbia University*
- Aug. 2015 Talk, *Synoptic Surveys: Boutique & Experiments*
- Jul. 2015 SPI-MAX Seminar, *University of Oxford*
- May 2015 Astronomy Tea Talk, *California Institute of Technology*

Contributed Presentations

- Jul. 2018 Talk and Poster, *21st European Workshop on White Dwarfs*
- Dec. 2017 Poster, *Deciphering the Violent Universe*
- Jul. 2017 Talk, *Eighth Meeting on Hot Subdwarfs and Related Objects*
- Mar. 2017 Talk, *The AGB-Supernovae Mass Transition*
- Jul. 2016 Talk and Poster, *20th European Workshop on White Dwarfs*
- Feb. 2016 Talk, *Electron Capture Supernovae and Super-AGB Star Workshop*
- Jan. 2016 Dissertation Talk, *227th Meeting of the American Astronomical Society*
- Jul. 2015 Talk, *Seventh Meeting on Hot Subdwarfs and Related Objects*
- Jan. 2015 Poster, *225th Meeting of the American Astronomical Society*
- Sep. 2014 Poster, *Binary Systems: Their Evolution and Environments*
- Jul. 2014 Poster, *Why Galaxies Care about AGB Stars III*
- Jul. 2012 Poster, *Rattle and Shine: GW and EM Studies of Compact Binary Mergers*
- Sep. 2011 Poster, *IAU Symposium 285: New Horizons in Time Domain Astronomy*

Grants

- 2019 Lorentz Center Workshop (International Award; €25k)
- 2016–2019 Hubble Fellowship (National Award; \$350k)
- 2018–2019 XSEDE Startup Allocation (National Award; 50k SUs, \$1k equivalent)
- 2010–2015 NSF Graduate Research Fellowship (National Award; \$150k)
- 2009–2015 Various Research Travel Grants (Campus & National Awards; \$10k)

Service

- 2017–Present Co-organizer, UCSC Department Seminar (FLASH)
- 2015–Present Director, MESA Summer School
- 2015–Present Referee (A&A, ApJ, MNRAS, Phys. Rev. D, JOSS, Nature Physics)
 - 2018 Reviewer, NASA Earth and Space Science Fellowship
 - 2015 Graduate student representative for Department of Astronomy faculty search
- 2012–Present Extremely active on mesa-users mailing list

Outreach

- Apr. 2018 Public Talk, *Astronomy on Tap*, Santa Cruz, CA
- May 2017 Public Talk, *Café KITP*, Santa Barbara, CA

Teaching Experience

- 2017–2018 **Project Mentor**, *Department of Astronomy & Astrophysics*, UC Santa Cruz.
Guided undergraduate students through a first research project as part of the course “Introduction to Research in Physics and Astrophysics”
- 2013–2018 **Teaching Staff**, *MESA Summer School*, UC Santa Barbara.
Developed and presented tutorials on how to use the MESA stellar evolution code
- 2009–2016 **Compass Project**, UC Berkeley.
Involved in teaching and curriculum design as well as in various leadership roles
- 2013 **Graduate Student Instructor**, *Department of Astronomy*, UC Berkeley.
Designed and taught sections for a non-majors course “Origins: From the Big Bang to the Emergence of Humans”
- 2011 **Graduate Student Instructor**, *Department of Astronomy*, UC Berkeley.
Taught sections for upper-division course on stellar structure & evolution
- 2009–2010 **Graduate Student Instructor**, *Department of Physics*, UC Berkeley.
Taught sections for introductory physics for non-majors

Peer-Reviewed Publications

First or Second Author

- Oct. 2018 **Minimum Orbital Period of Precataclysmic Variables**
L. Nelson, J. Schwab, M. Ristic, and S. Rappaport
ApJ, 866, p. 88
- Oct. 2018 **Mixing via Thermocompositional Convection in Hybrid C/O/Ne White Dwarfs**
J. Schwab, and P. Garaud
Submitted to ApJ, arXiv:1810.07193 (astro-ph.SR)
- Oct. 2018 **Residual Carbon in Oxygen-Neon White Dwarfs and its Implications for Accretion-Induced Collapse**
J. Schwab, and K. A. Rocha
Submitted to ApJ, arXiv:1810.13002 (astro-ph.SR)
- June 2018 **Hot subdwarfs formed from the merger of two He white dwarfs**
J. Schwab
MNRAS, 476, pp. 5303–5311
- Feb. 2018 **Modules for Experiments in Stellar Astrophysics (MESA): Convective Boundaries, Element Diffusion, and Massive Star Explosions**
B. Paxton, J. Schwab, E. B. Bauer, L. Bildsten, S. Blinnikov, P. Duffell, R. Farmer, J. A. Goldberg, P. Marchant, E. Sorokina, A. Thoul, R. H. D. Townsend, and F. X. Timmes
ApJS, 234, p. 34
- Dec. 2017 **Exploring the Carbon Simmering Phase: Reaction Rates, Mixing, and the Convective Urca Process**
J. Schwab, H. Martínez-Rodríguez, A. L. Piro, and C. Badenes
ApJ, 851, p. 105
- Dec. 2017 **Fast and Luminous Transients from the Explosions of Long-lived Massive White Dwarf Merger Remnants**
J. Brooks, J. Schwab, L. Bildsten, E. Quataert, B. Paxton, S. Blinnikov, and E. Sorokina
ApJ, 850, p. 127
- Dec. 2017 **The importance of Urca-process cooling in accreting ONe white dwarfs**
J. Schwab, L. Bildsten, and E. Quataert
MNRAS, 472, pp. 3390–3406
- Aug. 2017 **Electron Captures on ^{14}N as a Trigger for Helium Shell Detonations**
E. B. Bauer, J. Schwab, and L. Bildsten
ApJ, 845, p. 97
- July 2017 **Accretion-induced Collapse from Helium Star + White Dwarf Binaries**
J. Brooks, J. Schwab, L. Bildsten, E. Quataert, and B. Paxton
ApJ, 843, p. 151
- Jan. 2017 **Convection Destroys the Core/Mantle Structure in Hybrid C/O/Ne White Dwarfs**
J. Brooks, J. Schwab, L. Bildsten, E. Quataert, and B. Paxton
ApJL, 834, p. L9

- Jan. 2017 **Wait for It: Post-supernova Winds Driven by Delayed Radioactive Decays**
K. J. Shen, and [J. Schwab](#)
ApJ, 834, p. 180
- Dec. 2016 **The evolution and fate of super-Chandrasekhar mass white dwarf merger remnants**
[J. Schwab](#), E. Quataert, and D. Kasen
MNRAS, 463, pp. 3461–3475
- Nov. 2016 **Turbulent Chemical Diffusion in Convectively Bounded Carbon Flames**
D. Lecoanet, [J. Schwab](#), E. Quataert, L. Bildsten, F. X. Timmes, K. J. Burns, G. M. Vasil, J. S. Oishi, and B. P. Brown
ApJ, 832, p. 71
- Oct. 2015 **Thermal runaway during the evolution of ONeMg cores towards accretion-induced collapse**
[J. Schwab](#), E. Quataert, and L. Bildsten
MNRAS, 453, pp. 1910–1927
- Nov. 2012 **The viscous evolution of white dwarf merger remnants**
[J. Schwab](#), K. J. Shen, E. Quataert, M. Dan, and S. Rosswog
MNRAS, 427, pp. 190–203
- Aug. 2010 **Further Evidence for the Bimodal Distribution of Neutron-star Masses**
[J. Schwab](#), P. Podsiadlowski, and S. Rappaport
ApJ, 719, pp. 722–727
- Jan. 2010 **Galaxy-Scale Strong-Lensing Tests of Gravity and Geometric Cosmology: Constraints and Systematic Limitations**
[J. Schwab](#), A. S. Bolton, and S. A. Rappaport
ApJ, 708, pp. 750–757
- Jan. 2008 **Big bang nucleosynthesis constraints on the self-gravity of pressure**
S. Rappaport, [J. Schwab](#), S. Burles, and G. Steigman
Phys. Rev. D, 77.2, p. 023515
- [Co-Author](#)
- Nov. 2018 **The long-term evolution of Type Ia postgenitor stars**
M. Zhang, J. Fuller, [J. Schwab](#), and R. Foley
Submitted to ApJ
- Sept. 2018 **A search for a surviving companion in SN 1006**
W. E. Kerzendorf, G. Strampelli, K. J. Shen, [J. Schwab](#), R. Pakmor, T. Do, J. Buchner, and A. Rest
MNRAS, 479, pp. 192–199

- Sept. 2018 **Three Hypervelocity White Dwarfs in Gaia DR2: Evidence for Dynamically Driven Double-degenerate Double-detonation Type Ia Supernovae**
K. J. Shen, D. Boubert, B. T. Gänsicke, S. W. Jha, J. E. Andrews, L. Chomiuk, R. J. Foley, M. Fraser, M. Gromadzki, J. Guillochon, M. M. Kotze, K. Maguire, M. R. Siebert, N. Smith, J. Strader, C. Badenes, W. E. Kerzendorf, D. Koester, M. Kromer, B. Miles, R. Pakmor, [J. Schwab](#), O. Toloza, S. Toonen, D. M. Townsley, and B. J. Williams
ApJ, 865, p. 15
- July 2016 **Neutronization During Carbon Simmering In Type Ia Supernova Progenitors**
H. Martínez-Rodríguez, A. L. Piro, [J. Schwab](#), and C. Badenes
ApJ, 825, p. 57
- Apr. 2016 **Carbon Shell or Core Ignitions in White Dwarfs Accreting from Helium Stars**
J. Brooks, L. Bildsten, [J. Schwab](#), and B. Paxton
ApJ, 821, p. 28
- Sept. 2015 **Modules for Experiments in Stellar Astrophysics (MESA): Binaries, Pulsations, and Explosions**
B. Paxton, P. Marchant, [J. Schwab](#), E. B. Bauer, L. Bildsten, M. Cantiello, L. Dessart, R. Farmer, H. Hu, N. Langer, R. H. D. Townsend, D. M. Townsley, and F. X. Timmes
ApJS, 220, p. 15
- May 2015 **The interplay of disc wind and dynamical ejecta in the aftermath of neutron star-black hole mergers**
R. Fernández, E. Quataert, [J. Schwab](#), D. Kasen, and S. Rosswog
MNRAS, 449, pp. 390–402
- June 2014 **Type Ia Supernovae from Merging White Dwarfs. II. Post-merger Detonations**
C. Raskin, D. Kasen, R. Moll, [J. Schwab](#), and S. Woosley
ApJ, 788, p. 75
- June 2009 **The Dark-matter Fraction in the Elliptical Galaxy Lensing the Quasar PG 1115+080**
D. Pooley, S. Rappaport, J. Blackburne, P. L. Schechter, [J. Schwab](#), and J. Wambsganss
ApJ, 697, pp. 1892–1900
- Mar. 2007 **The Kinetic Luminosity Function and the Jet Production Efficiency of Growing Black Holes**
S. Heinz, A. Merloni, and [J. Schwab](#)
ApJL, 658, pp. L9–L12