

Jamie Alexander Powell Law-Smith

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RESEARCH INTERESTS

My interests are in high energy astrophysics theory and high energy physics theory. Particular problems I am interested in include tidal disruptions of stars by black holes, the formation of gravitational wave sources, the structure of active galactic nucleus disks with embedded stars, the host galaxies of high energy astrophysical phenomena, black holes and de Sitter matrix theory, vacuum decay, and de Sitter space in string theory.

POSITIONS HELD

ITC Fellow, Center for Astrophysics | Harvard & Smithsonian, 2021-2023

Assistant Professor, Department of Astronomy and Astrophysics, University of Chicago, starting 2023

EDUCATION

University of California Santa Cruz, Ph.D. in Astronomy & Astrophysics, 2015-2021

Harvard University, A.B. in Physics, Astrophysics (double), 2010-2014

AWARDS

Harvard ITC Fellowship (5-yr), 2021

IAS Membership, 2021, *declined*

AAS Doxsey Prize, 2021

Elmer A. Fridley Scholarship in the Physical Sciences (UC Santa Cruz), 2020

Regents' Fellowship (UC Santa Cruz), 2019

Whitford Prize for highest achievement in research, coursework, and preliminary exam (UCSC), 2017

NR Tuition Fellowship (UC Santa Cruz), 2015

Leo Goldberg Award for outstanding Junior thesis in Astronomy (Harvard University), 2013

David Rockefeller International Experience Grant, 2012

Harvard College Research Program Fellowship (Harvard University), 2012

GRANTS

Collaborator, NSF, "Multiple Approaches to Multiple-Messenger Astronomy," \$688K, 2019-2022

Collaborator, NSF MRI, "Acquisition of a High Performance Computer for Computational Science at UC Santa Cruz," \$1.547 million, 2018-2021

Co-I, NASA HEC supercomputing allocation, "Modeling of Panchromatic Tidal Disruption Flares," 400K SBU, 2018

Co-I, NASA ATP TCAN, "Modeling of Panchromatic Transients," \$397K, 2014-2018

Collaborator, NSF, “Tidal Disruption of Stars in Galaxy Centers: Connecting Models to Observations,” \$264K, 2016-2019

Co-I, NASA HEC supercomputing allocation, “Modeling of Panchromatic Tidal Disruption Flares,” 213K SBU, 2017

Co-I, NASA HEC supercomputing allocation, “Modeling of Panchromatic Tidal Disruption Flares,” 102K SBU, 2016

TALKS

CfA Summer Luncheon, 2022

UMass Dartmouth Seminar, Department of Physics, 2022

UCLA Colloquium, Department of Physics & Astronomy, 2021

ITC Colloquium, Center for Astrophysics | Harvard & Smithsonian, 2021

University of Chicago Colloquium, Department of Astronomy & Astrophysics, 2021

UT Austin Colloquium, Department of Astronomy, 2021

237th Annual Meeting of the AAS, 2021

SFSU Colloquium, Department of Physics and Astronomy, 2020

Caltech TAPIR Seminar, 2020

Harvard CfA Galaxies & Cosmology and Stars & Planets Seminar, 2020

MIT Brown Bag Lunch, 2020

UC Berkeley “Explosive Astro”, 2020

Harvard-Monash University Meeting, 2020

Princeton University, Quataert group meeting, 2020

Northwestern CIERA Seminar, 2020

DARK Cake Talk, DARK Cosmology Centre, Niels Bohr Institute, University of Copenhagen, 2020

Tidal Disruptions in Kyoto: Confronting Theory with Observations, Japan, 2020

Compact Objects for All Conference (review talk), Lund Observatory, Sweden, 2020

Dunlap Institute for Astronomy & Astrophysics, University of Toronto, Canada, 2018

Using Tidal Disruption Events to Study Supermassive Black Holes, Aspen, CO, 2018

TDE17: Piercing the sphere of influence, Cambridge, UK, 2017

UC Santa Cruz FLASH Seminar, 2017

UC Santa Cruz Transient Lunch, 2017

Jerusalem Tidal Disruption Event Workshop, Israel, 2015

Tidal Disruption Event Fest at UC Santa Cruz, 2015

TEACHING

Astronomy 1, Introduction to the Cosmos, UCSC, Teaching Assistant, 2021

Astronomy 1, Introduction to the Cosmos, UCSC, Teaching Assistant, 2019

Astronomy 111, Order of Magnitude Astrophysics, UCSC. Taught half of lecture (~40 students), 2018

Astronomy 119, Introduction to Scientific Computing, UCSC, Teaching Assistant, 2018

Astronomy 111, Order of Magnitude Astrophysics, UCSC. Taught half of lecture (~25 students), 2016

Astronomy 111, Order of Magnitude Astrophysics, UCSC. Taught half of lecture (~25 students), 2015

Physics 15b Laboratory, Introductory Electromagnetism, Harvard University, Teaching Fellow, 2011

OUTREACH

Mentor, Lamat Summer Research Program, UCSC. Mentor for undergraduate research program aimed at underrepresented minorities. Helped students with research and posters that were presented at conferences, 2016.

Visiting Teacher, Taktse International School, Sikkim, India. Physics, Astronomy, and Computer Science teaching, curriculum design, and mentoring for K-12. Developed new Computer Science course and helped two mentees become first-generation college students at schools in the US, 2014.

STUDENTS ADVISED

Chang Liu, undergraduate (Peking University); now PhD at Northwestern; 2020-2021

Monica Gallegos-Garcia, undergraduate (UCSC); paper published; now PhD at Northwestern; 2015-2018

Priscilla Camacho Olachea, “post-bac” student (UCSC); now PhD at University of Kentucky; 2016-2017

PUBLICATIONS

Up-to-date list available on [ADS](#), [INSPIRE](#), or [Google Scholar](#).

* indicates alphabetical authorship order. † indicates advised student.

1. Aleo, P. D., et al., incl. **Law-Smith, J. A. P.**, 2022, “The Young Supernova Experiment Data Release 1 (YSE DR1): Light Curves and Photometric Classification of 1975 Supernovae,” submitted to ApJ [arXiv:2211.07128].
2. † Liu, C., Mockler, B., Ramirez-Ruiz, E., Yarza, R., **Law-Smith, J. A. P.**, Naoz, S., Melchor, D., & Rose, S., 2022, “Tidal disruption events from eccentric orbits and lessons learned from the noteworthy ASASSN-14ko,” submitted to ApJ [arXiv:2206.13494].
3. Zellmann, S., Seifried, D., Morrical, N., Wald, I., Usher, W., **Law-Smith, J. A. P.**, Walch-Gassner, S., & Hinkenjann, A., 2022, “Point Containment Queries on Ray Tracing Cores for AMR Flow Visualization,” CiSE, 24, 2 [arXiv:2202.12020].
4. Mockler, B., Twum, A. A., Auchettl, K., Dodd, S., French, K. D., **Law-Smith, J. A. P.**, & Ramirez-Ruiz, E., 2022, “Evidence for the Preferential Disruption of Moderately Massive Stars by Supermassive Black Holes,” ApJ, 924, 70 [arXiv:2110.03013].
5. Rossi, E. M., Stone, N. C., **Law-Smith, J. A. P.**, Macleod, M., Lodato, G., Dai, J. L., & Mandel, I., 2021, “The Process of Stellar Tidal Disruption by Supermassive Black Holes,” SSRv, 217, 40 [arXiv:2005.12528].
6. * Dine, M., **Law-Smith, J. A. P.**, Sun, S., Wood, D., & Yu, Y., 2021, “Obstacles to constructing de Sitter space in string theory,” JHEP, 2021, 50 [arXiv:2008.12399].
7. Jones, D. O., Foley, R. J., Narayan, G., Hjorth, J., Huber, M. E., Aleo, P. D., Alexander, K. D., Angus, C. R., Auchettl, K., Baldassare, V. F., Bruun, S. H., Chambers, K. C., Chatterjee, D., Coppejans, D. L., Coulter, D. A., DeMarchi, L., Dimitriadis, G., Drout, M. R., Engel, A., French, K. D., Gagliano, A., Gall, C., Hung, T., Izzo, L., Jacobson-Galán, W. V., Kilpatrick, C. D., Korhonen, H., Margutti, R., Raimundo, S. I., Ramirez-Ruiz, E., Rest, A., Rojas-Bravo, C., Siebert, M. R., Smartt, S. J., Smith, K. W., Terreran, G., Wang, Q., Wojtak, R., Agnello, A., Ansari, Z., Arendse, N., Baldeschi, A., Blanchard, P. K., Brethauer, D., Bright, J. S., Brown, J. S., de Boer, T. J. L., Dodd, S. A., Fairlamb, J. R., Grillo, C., Hajela, A., Hede, C., Kolborg, A. N., **Law-Smith, J. A. P.**, Lin, C.-C., Magnier, E. A., Malanchev, K., Matthews, D., Mockler, B., Muthukrishna, D., Pan, Y.-C., Pfister, H.,

- Ramanah, D. K., Rest, S., Sarangi, A., Schröder, S. L., Stauffer, C., Stroh, M. C., Taggart, K. L., Tinyanont, S., Wainscoat, R. J., & Young Supernova Experiment, 2021, “The Young Supernova Experiment: Survey Goals, Overview, and Operations,” *ApJ*, 908, 143 [arXiv:2010.09724].
8. † Dodd, S. A., **Law-Smith, J. A. P.**, Auchettl, K., Ramirez-Ruiz, E., & Foley, R. J., 2021, “The Landscape of Galaxies Harboring Changing-look Active Galactic Nuclei in the Local Universe,” *ApJL*, 907, L21 [arXiv:2010.10527].
 9. **Law-Smith, J. A. P.**, Coulter, D. A., Guillochon, J., Mockler, B., & Ramirez-Ruiz, E., 2020, “Stellar Tidal Disruption Events with Abundances and Realistic Structures (STARS): Library of Fallback Rates,” *ApJ*, 905, 141 [arXiv:2007.10996].
 10. **Law-Smith, J. A. P.**, Everson, R. W., Ramirez-Ruiz, E., de Mink, S. E., van Son, L. A. C., Götberg, Y., Zellmann, S., Vigna-Gómez, A., Renzo, M., Wu, S., Schröder, S. L., Foley, R. J., & Hutchinson-Smith, T., 2020, “Successful Common Envelope Ejection and Binary Neutron Star Formation in 3D Hydrodynamics,” submitted to *ApJ* [arXiv:2011.06630].
 11. Hung, T., Foley, R. J., Ramirez-Ruiz, E., Dai, J. L., Auchettl, K., Kilpatrick, C. D., Mockler, B., Brown, J. S., Coulter, D. A., Dimitriadis, G., Holoien, T. W.-S., **Law-Smith, J. A. P.**, Piro, A. L., Rest, A., Rojas-Bravo, C., & Siebert, M. R., 2020, “Double-peaked Balmer Emission Indicating Prompt Accretion Disk Formation in an X-Ray Faint Tidal Disruption Event,” *ApJ*, 903, 31 [arXiv:2003.09427].
 12. **Law-Smith, J. A. P.**, Coulter, D. A., & Mockler, B., 2020, “jamielaw-smith/STARS_library”, v1.0.5, Zenodo, doi:10.5281/zenodo.4062018.
 13. French, K. D., Wevers, T., **Law-Smith, J. A. P.**, Graur, O., & Zabludoff, A. I., 2020, “The Host Galaxies of Tidal Disruption Events,” *SSRv*, 216, 32 [arXiv:2003.02863].
 14. **Law-Smith, J. A. P.**, Guillochon, J., & Ramirez-Ruiz, E., 2019, “The Tidal Disruption of Sun-like Stars by Massive Black Holes,” *ApJL*, 882, L25 [arXiv:1907.04859].
 15. † Gallegos-Garcia, M., **Law-Smith, J. A. P.**, & Ramirez-Ruiz, E., 2018, “Tidal Disruptions of Main-sequence Stars of Varying Mass and Age: Inferences from the Composition of the Fallback Material,” *ApJ*, 857, 109 [arXiv:1801.03497].
 16. **Law-Smith, J. A. P.**, Ramirez-Ruiz, E., Ellison, S. L., & Foley, R. J., 2017, “Tidal Disruption Event Host Galaxies in the Context of the Local Galaxy Population,” *ApJ*, 850, 22 [arXiv:1707.01559].
 17. **Law-Smith, J. A. P.**, MacLeod, M., Guillochon, J., Macias, P., & Ramirez-Ruiz, E., 2017, “Low-mass White Dwarfs with Hydrogen Envelopes as a Missing Link in the Tidal Disruption Menu,” *ApJ*, 841, 132 [arXiv:1701.08162].
 18. **Law-Smith, J. A. P.**, & Eisenstein, D. J., 2017, “The Color and Stellar Mass Dependence of Small-scale Galaxy Clustering in SDSS-III BOSS,” *ApJ*, 836, 87 [arXiv:1702.03933].