

MATTHEW SIEBERT - CURRICULUM VITAE

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PHD INFORMATION

Affiliation: University of California Santa Cruz

PhD Topic: Type Ia Supernova Spectroscopy

PhD Advisor: Ryan Foley

EDUCATION

Cornell University, Ithaca, NY

August 2012 - June 2016

Bachelor of Science: Engineering Physics

AWARDS AND FELLOWSHIPS

UC Santa Cruz Department of Astronomy Whitford Prize

2018

National Science Foundation Graduate Research Fellowship

2017-2018

PUBLICATIONS

First Author Publications

“A Possible Distance Bias for Type Ia Supernovae with Different Ejecta Velocities” **M. R. Siebert**, R. J. Foley, D. O. Jones, and K. W. Davis. 2020. [arXiv:2002.09490]

“Investigating the Diversity of Type Ia Supernova Spectra with the Open-Source Relational Database Kaepora” **M. R. Siebert**, R. J. Foley, D. O. Jones, R. Angulo, K. Davis, A. Duarte, E. Strasburger, M. Conlon, N. Kazmi, R. Nishimoto, M. Schubert, L. Sun, and R. Tippens. 2019. MNRAS, Volume 486, Issue 4, p.5785-5808. [arXiv:1905.02204]

“The Unprecedented Properties of the First Electromagnetic Counterpart to a Gravitational-wave Source”. **Siebert, M. R.**; Foley, R. J.; Drout, M. R.; Kilpatrick, C. D.; Shappee, B. J.; Coulter, D. A.; Kasen, D.; Madore, B. F.; Murguia-Berthier, A.; Pan, Y. -C.; Piro, A. L.; Prochaska, J. X.; Ramirez-Ruiz, E.; Rest, A.; Contreras, C.; Morrell, N.; Rojas-Bravo, C.; Simon, J. D. ApJL, Volume 848, Issue 2, article id. L26, 6 pp. 2017. [arXiv:1710.05440]

Co-authored Publications

“The Foundation Supernova Survey: Measuring Cosmological Parameters with Supernovae from a Single Telescope”. Jones, D. O.; Scolnic, D. M.; Foley, R. J.; Rest, A.; Kessler, R.; Challis, P. M.; Chambers, K. C.; Coulter, D. A.; Dettman, K. G.; Foley, M. M.; Huber, M. E.; Jha, S. W.; Johnson, E.; Kilpatrick, C. D.; Kirshner, R. P.; Manuel, J.; Narayan, G.; Pan, Y. -C.; Riess, A. G.; Schultz, A. S. B. **Siebert, M. R.**; Berger, E.; Chornock, R.; Flewelling, H.; Magnier, E. A.; Smartt, S. J.; Smith, K. W.; Wainscoat, R. J.; Waters, C.; Willman, M. ApJ, Volume 881, Issue 1, article id. 19, 23 pp. 2019. [arXiv:1811.09286]

“Discovery of Highly Blueshifted Broad Balmer and Metastable Helium Absorption Lines in a Tidal Disruption Event”. Hung, T.; Cenko, S. B.; Roth, Nathaniel; Gezari, S.; Veilleux, S.; van Velzen, Sjoert; Gaskell, C. Martin; Foley, Ryan J.; Blagorodnova, N.; Yan, Lin; Graham, M. J.; Brown, J. S.; **Siebert, M. R.**; Frederick, Sara; Ward, Charlotte; Gatkine, Pradip; Gal-Yam, Avishay; Yang, Yi; Schulze, S.; Dimitriadis, G. Kupfer, Thomas; Shupe, David L.; Rusholme, Ben; Masci, Frank J.; Riddle, Reed; Soumagnac, Maayane T.; van Roestel, J.; Dekany, Richard. ApJ, Volume 879, Issue 2, article id. 119, 17 pp. 2019. [arXiv:1903.05637]

“Gravity and Light: Combining Gravitational Wave and Electromagnetic Observations in the 2020s”.

Foley, R. J.; Alexander, K. D.; Andreoni, I.; Arcavi, I.; Auchetl, K.; Barnes, J.; Baym, G.; Bellm, E. C.; Beloborodov, A. M.; Blagorodnova, N.; Blakeslee, J. P.; Brady, P. R.; Branchesi, M.; Brown, J. S.; Butler, N.; Cantiello, M.; Chornock, R.; Cook, D. O.; Cooke, J.; Coppejans, D. L. Corsi, A.; Couch, S. M.; Coughlin, M. W.; Coulter, D. A.; Cowperthwaite, P. S.; Dietrich, T.; Dimitriadis, G.; Drout, M. R.; Elias, J. H.; Farr, B.; Fernandez, R.; Filippenko, A. V.; Fong, W.; Fragos, T.; Frail, D. A.; Freedman, W. L.; Fryer, C. L.; Golkhou, V. Z.; Hiramatsu, D.; Hjorth, J.; Horesh, A.; Hosseinzadeh, G.; Hotokezaka, K.; Howell, D. A.; Hung, T.; Jones, D. O.; Kalogera, V.; Kasen, D.; Kerzendorf, W. E.; Kilpatrick, C. D.; Kirshner, R. P.; Krisciunas, K.; Lattimer, J. M.; Lazzati, D.; Levan, A. J.; MacFadyen, A. I.; Maeda, K.; Mandel, I.; Mandel, K. S.; Margalit, B.; Margutti, R.; McIver, J.; Metzger, B. D.; Mooley, K.; Moriya, T.; Murguia-Berthier, A.; Narayan, G.; Nicholl, M.; Nissanke, S.; Nomoto, K.; O’Meara, J. M.; O’Shaughnessy, R.; O’Connor, E.; Palmese, A.; Pan, Y. -C.; Pankow, C.; Paterson, K.; Perley, D. A.; Perna, R.; Piro, A. L.; Pritchard, T. A.; Quataert, E.; Radice, D.; Ramirez-Ruiz, E.; Reddy, S.; Rest, A.; Riess, A. G.; Rodriguez, C. L.; Rojas-Bravo, C.; Rossi, E. M.; Rosswog, S.; Ruiz, M.; Shapiro, S. L.; Shoemaker, D. H.; **Siebert, M. R.**; Siegel, D. M.; Siellez, K.; Smith, N.; Soares-Santos, M.; Suntzeff, N. B.; Surman, R.; Tanaka, M.; Tanvir, N. R.; Terreran, G.; Valenti, S.; Villar, V. A.; Wang, L.; Webb, S. A.; Wheeler, J. C.; Williams, P. K. G.; Woosley, S.; Zaldarriaga, M.; Zevin, M. White Paper. 2019. [arXiv:1903.04553]

“SN 2017ens: The Metamorphosis of a Luminous Broadlined Type Ic Supernova into an SN IIn”. Chen, T. -W.; Inserra, C.; Fraser, M.; Moriya, T. J.; Schady, P.; Schweyer, T.; Filippenko, A. V.; Perley, D. A.; Ruiter, A. J.; Seitzzahl, I.; Sollerman, J.; Taddia, F.; Anderson, J. P.; Foley, R. J.; Jerkstrand, A.; Ngeow, C. -C.; Pan, Y. -C.; Pastorello, A.; Points, S.; Smartt, S. J. Smith, K. W.; Taubenberger, S.; Wiseman, P.; Young, D. R.; Benetti, S.; Berton, M.; Bufano, F.; Clark, P.; Della Valle, M.; Galbany, L.; Gal-Yam, A.; Gromadzki, M.; Gutierrez, C. P.; Heinze, A.; Kankare, E.; Kilpatrick, C. D.; Kuncarayakti, H.; Leloudas, G.; Lin, Z. -Y.; Maguire, K.; Mazzali, P.; McBrien, O.; Prentice, S. J.; Rau, A.; Rest, A.; **Siebert, M. R.**; Stalder, B.; Tonry, J. L.; Yu, P. -C. ApJL, Volume 867, Issue 2, article id. L31, 8 pp. 2018. [arXiv:1808.04382]

“Should Type Ia Supernova Distances Be Corrected for Their Local Environments?”. Jones, D. O.; Riess, A. G.; Scolnic, D. M.; Pan, Y. -C.; Johnson, E.; Coulter, D. A.; Dettman, K. G.; Foley, M. M.; Foley, R. J.; Huber, M. E.; Jha, S. W.; Kilpatrick, C. D.; Kirshner, R. P.; Rest, A.; Schultz, A. S. B.; **Siebert, M. R.** ApJ, Volume 867, Issue 2, article id. 108, 14 pp. 2018. [arXiv:1805.05911]

“Three Hypervelocity White Dwarfs in Gaia DR2: Evidence for Dynamically Driven Double degenerate Double-detonation Type Ia Supernovae”. Shen, Ken J.; Boubert, Douglas; Gnsicke, Boris T.; Jha, Saurabh W.; Andrews, Jennifer E.; Chomiuk, Laura; Foley, Ryan J.; Fraser, Morgan; Gromadzki, Mariusz; Guillochon, James; Kotze, Marissa M.; Maguire, Kate; **Siebert, Matthew R.**; Smith, Nathan; Strader, Jay; Badenes, Carles; Kerzendorf, Wolfgang E.; Koester, Detlev; Kromer, Markus; Miles, Broxton Pakmor, Rdiger; Schwab, Josiah; Toloza, Odette; Toonen, Silvia; Townsley, Dean M.; Williams, Brian J. ApJ, Volume 865, Issue 1, article id. 15, 14 pp. 2018. [arXiv:1804.11163]

“SN 2016esw: a luminous Type II supernova observed within the first day after the explosion”. de Jaeger, Thomas; Galbany, Llus; Gutierrez, Claudia P.; Filippenko, Alexei V.; Zheng, WeiKang; Brink, Thomas G.; Foley, Ryan J.; Snchez, Sebastian F.; Channa, Sanyum; de Kouchkovsky, Maxime; Halevi, Goni; Kilpatrick, Charles D.; Kumar, Sahana; Molloy, Jeffrey; Pan, Yen-Chen; Ross, Timothy W.; Shivers, Isaac; **Siebert, Matthew R.**; Stahl, Benjamin; Stegman, Samantha Yunus, Sameen. MNRAS, Volume 478, Issue 3, p.3776-3792. 2018. [arXiv:1905.02204]

“The Foundation Supernova Survey: motivation, design, implementation, and first data release”. Foley, Ryan J.; Scolnic, Daniel; Rest, Armin; Jha, S. W.; Pan, Y. -C.; Riess, A. G.; Challis, P.; Chambers, K. C.; Coulter, D. A.; Dettman, K. G.; Foley, M. M.; Fox, O. D.; Huber, M. E.; Jones, D. O.; Kilpatrick, C. D.; Kirshner, R. P.; Schultz, A. S. B.; **Siebert, M. R.**; Flewelling, H. A.; Gibson, B. Magnier, E. A.; Miller, J. A.; Primak, N.; Smartt, S. J.; Smith, K. W.; Wainscoat, R. J.; Waters, C.; Willman, M.

“Electromagnetic evidence that SSS17a is the result of a binary neutron star merger”. Kilpatrick, C. D.; Foley, R. J.; Kasen, D.; Murguia-Berthier, A.; Ramirez-Ruiz, E.; Coulter, D. A.; Drout, M. R.; Piro, A. L.; Shappee, B. J.; Boutsia, K.; Contreras, C.; Di Mille, F.; Madore, B. F.; Morrell, N.; Pan, Y. -C.; Prochaska, J. X.; Rest, A.; Rojas-Bravo, C.; **Siebert, M. R.**; Simon, J. D. Ulloa, N. Science, Volume 358, Issue 6370, pp. 1583-1587. 2017. [arXiv:1710.05434]

“Early spectra of the gravitational wave source GW170817: Evolution of a neutron star merger”. Shappee, B. J.; Simon, J. D.; Drout, M. R.; Piro, A. L.; Morrell, N.; Prieto, J. L.; Kasen, D.; Holoien, T. W. -S.; Kollmeier, J. A.; Kelson, D. D.; Coulter, D. A.; Foley, R. J.; Kilpatrick, C. D.; **Siebert, M. R.**; Madore, B. F.; Murguia-Berthier, A.; Pan, Y. -C.; Prochaska, J. X.; Ramirez-Ruiz, E.; Rest, A. Adams, C.; Alatalo, K.; Baados, E.; Baughman, J.; Bernstein, R. A.; Bitsakis, T.; Boutsia, K.; Bravo, J. R.; Di Mille, F.; Higgs, C. R.; Ji, A. P.; Maravelias, G.; Marshall, J. L.; Placco, V. M.; Prieto, G.; Wan, Z. Science, Volume 358, Issue 6370, pp. 1574-1578. 2017. [arXiv:1710.05432]

“Light curves of the neutron star merger GW170817/SSS17a: Implications for r-process nucleosynthesis”. Drout, M. R.; Piro, A. L.; Shappee, B. J.; Kilpatrick, C. D.; Simon, J. D.; Contreras, C.; Coulter, D. A.; Foley, R. J.; **Siebert, M. R.**; Morrell, N.; Boutsia, K.; Di Mille, F.; Holoien, T. W. -S.; Kasen, D.; Kollmeier, J. A.; Madore, B. F.; Monson, A. J.; Murguia-Berthier, A.; Pan, Y. -C.; Prochaska, J. X. Ramirez-Ruiz, E.; Rest, A.; Adams, C.; Alatalo, K.; Baados, E.; Baughman, J.; Beers, T. C.; Bernstein, R. A.; Bitsakis, T.; Campillay, A.; Hansen, T. T.; Higgs, C. R.; Ji, A. P.; Maravelias, G.; Marshall, J. L.; Moni Bidin, C.; Prieto, J. L.; Rasmussen, K. C.; Rojas-Bravo, C.; Strom, A. L.; Ulloa, N.; Vargas-Gonzalez, J.; Wan, Z.; Whitten, D. D. Science, Volume 358, Issue 6370, pp. 1570-1574. Page 3. 2017. [arXiv:1710.05443]

“Swope Supernova Survey 2017a (SSS17a), the optical counterpart to a gravitational wave source”. Coulter, D. A.; Foley, R. J.; Kilpatrick, C. D.; Drout, M. R.; Piro, A. L.; Shappee, B. J.; **Siebert, M. R.**; Simon, J. D.; Ulloa, N.; Kasen, D.; Madore, B. F.; Murguia-Berthier, A.; Pan, Y. -C.; Prochaska, J. X.; Ramirez-Ruiz, E.; Rest, A.; Rojas-Bravo, C. Science, Volume 358, Issue 6370, pp. 1556-1558. 2017. [arXiv:1710.05452]

“A gravitational-wave standard siren measurement of the Hubble constant”. Abbott, B. P. et al. Nature, Volume 551, Issue 7678, pp. 85-88. 2017. [arXiv:1710.05835]

“A Neutron Star Binary Merger Model for GW170817/GRB 170817A/SSS17a”. Murguia-Berthier, A.; Ramirez-Ruiz, E.; Kilpatrick, C. D.; Foley, R. J.; Kasen, D.; Lee, W. H.; Piro, A. L.; Coulter, D. A.; Drout, M. R.; Madore, B. F.; Shappee, B. J.; Pan, Y. -C.; Prochaska, J. X.; Rest, A.; Rojas-Bravo, C.; **Siebert, M. R.**; Simon, J. D. . ApJL, Volume 848, Issue 2, article id. L34, 8 pp. 2017. [arXiv:1710.05453]

“The Old Host-galaxy Environment of SSS17a, the First Electromagnetic Counterpart to a Gravitational-wave Source”. Pan, Y. -C.; Kilpatrick, C. D.; Simon, J. D.; Xhakaj, E.; Boutsia, K.; Coulter, D. A.; Drout, M. R.; Foley, R. J.; Kasen, D.; Morrell, N.; Murguia-Berthier, A.; Osip, D.; Piro, A. L.; Prochaska, J. X.; Ramirez-Ruiz, E.; Rest, A.; Rojas-Bravo, C.; Shappee, B. J.; **Siebert, M. R.** ApJL, Volume 848, Issue 2, article id. L30, 7 pp. 2017. [arXiv:1710.05439]

“Multi-messenger Observations of a Binary Neutron Star Merger”. Abbott, B. P. et al. ApJL, Volume 848, Issue 2, article id. L12, 59 pp. 2017. [arXiv:1710.05833]

“On the Progenitor of the Type IIb Supernova 2016gkg”. Kilpatrick, Charles D.; Foley, Ryan J.; Abramson, Louis E.; Pan, Yen-Chen; Lu, Cicero-Xinyu; Williams, Peter; Treu, Tommaso; **Siebert, Matthew R.**; Fassnacht, Christopher D.; Max, Claire E. MNRAS, Volume 465, Issue 4, p.4650-4657. 2017. [arXiv:1610.04587]

21 first authored

51 co-authored

OBSERVING EXPERIENCE

Keck Optical Spectroscopy/Adaptive Optics Imaging

Shane (Lick) Optical Spectroscopy

SOAR Optical Spectroscopy (Goodman)

KPNO Mayall Optical Spectroscopy (KOSMOS)

Nickel (Lick) Direct Imaging

George H. Herbig Observational Astronomy Workshop. Lick Observatory, Mt. Hamilton, CA. Shane and Nickel.

PRESENTATIONS

Talks

Conference - Progenitors of Type Ia Supernovae, Lijiang, China. *Using a Relational Database to Investigate Spectral Diversity in a Cosmological Sample.* 8/8/2019.

FLASH Talk, Department of Astronomy, University of Arizona. *Investigating the Diversity of Type Ia Supernova Observations with a Relational Database.* 8/2/2018.

FLASH Talk, Department of Astronomy and Astrophysics, UC Santa Cruz. *Familiar and Exotic Events in the Current Transient Landscape.* 4/20/2018.

Posters

F.O.E. Fifty-One Erg Supernova Conference. Corvallis, OR. *A Relational Database for Type Ia Supernova Observations.* 6/5/2017.

OTHER RESEARCH EXPERIENCE

MIT Haystack Observatory

A New Software User Interface for the Upgraded Haystack 37-meter Radio Telescope June 2015 - August 2015

REFERENCES

Ryan Foley: foley@ucsc.edu (University of California Santa Cruz)

James Lloyd: james.lloyd@cornell.edu (Cornell University)

EXTRA-CIRRICULAR

Co-Organized Nirmitee 2017 - a National Symposium of Civil Department of MIT, Pune

Attended a workshop on Autodesk Revit at IIT Bombay in 2014.

Winner of Inter Departmental Football Competition 2015.

Member of the Rotaract Club Of Pune Pride from 2014 to 2017.

Worked for a start-up company Named OUST as a Regional Marketing Manager

PERSONAL TRAITS

Highly motivated and eager to learn new things.

Strong motivational and leadership skills.

Ability to work as an individual as well as in group.