

Emily M. Silich

Department of Astronomy, California Institute of Technology

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Education

California Institute of Technology (Caltech)

Astrophysics, PhD (expected 2026) Astrophysics, MS (2023)

NSF Graduate Research Fellow

2023 - 2026

Wallace L. W. Sargent Graduate Fellow

2021 - 2022

University of Iowa

2017 - 2021

Astronomy, BS Physics, BS Mathematics, minor Major GPA: 4.0

with University Honors, High Distinction, Honors in Astronomy, Phi Beta Kappa

Research

Graduate Research Assistant

2021 -

Division of Physics, Mathematics and Astronomy, Caltech

Undergraduate Research Assistant

2017 - 2021

Department of Physics & Astronomy, University of Iowa

Research Intern

Summer 2020

X-ray Astrophysics Laboratory, NASA Goddard Space Flight Center

Student Researcher

Winter 2019

Canada-Norway Student Sounding Rocket Program (CaNoRock)

Publications (selected)

1. **E.M. Silich**, E. Bellomi, J. Sayers, J. ZuHone, U. Chadayammuri, S. Golwala, D. Hughes, A. Montaña, T. Mroczkowski, D. Nagai, D. Sánchez, S.A. Stanford, G. Wilson, M. Zemcov, and A. Zitrin, “*ICM-SHOX. Paper I: Methodology overview and discovery of a baryon–dark matter velocity decoupling in the MACS J0018.5+1626 merger*”, 2023, submitted to The Astrophysical Journal.
2. **E.M. Silich**, K. Jahoda, L. Angelini, P. Kaaret, A. Zajczyk, D.M. LaRocca, R. Ringuette, and J. Richardson, “*A Search for the 3.5 keV Line from the Milky Way’s Dark Matter Halo with HaloSat*”, 2021, The Astrophysical Journal, 916, 2.
3. A. Zajczyk, P. Kaaret, D. LaRocca, W. Fuelberth, H.C. Gulick, K. Jahoda, D.L. Kirchner, R. McCurdy, W.T. Robison, and **E. Silich**, “*On-ground calibration of the HaloSat science instrument*”, J. Astron. Telesc. Instrum. Syst. 6(4), 044005 (2020).
4. **E.M. Silich**, P. Kaaret, A. Zajczyk, D.M. LaRocca, J. Bluem, R. Ringuette, K. Jahoda, and K.D. Kuntz, “*Global X-Ray Properties of the Vela and Puppis A Supernova Remnants*”, 2020, The Astronomical Journal, 160, 1.
5. P. Kaaret, A. Zajczyk, D.M. LaRocca, R. Ringuette, J. Bluem, W. Fuelberth, H. Gulick, K. Jahoda, T.E. Johnson, D.L. Kirchner, D. Koutroumpa, K.D. Kuntz, R. McCurdy, D.M. Miles, W.T. Robison, and **E.M. Silich**, “*HaloSat - A CubeSat to Study the Hot Galactic Halo*”, 2019, The Astrophysical Journal, 884, 2.

Teaching

Ay 105: Optical Astronomy Instrumentation Lab

Graduate TA // Spring 2023

Ay 122c: High Energy Astronomical Measurements & Instrumentation

Graduate TA // Winter 2023

Ay 127: Astrophysical Cosmology

Graduate TA // Fall 2022

PHYS 1611: Introductory Physics I
PHYS 1512: College Physics II

Undergraduate TA // Spring 2020
Undergraduate TA // Spring 2020

Fellowships & Awards (selected)

Garmire Scholar, France A Cordova Graduate Student Fund (Caltech)	2023
NSF Graduate Research Fellowship (GRFP)	2023 - 2026
Wallace L. W. Sargent Graduate Fellowship (Caltech)	2021 - 2022
Chambliss Astronomy Achievement Student Awards - Honorable Mention	2021
University of Iowa Dare to Discover	2021
Barry Goldwater Scholar	2020
James A. Van Allen Award (Ulowa)	2020
John Mather Nobel Scholar (NASA/GSFC)	2020
Western Dubuque High School Young Accomplished Alumni	2020
APS Division of Astrophysics (DAP) Travel Grant	2020
Manuel Paul & Abraham Chinitz Liberal Arts & Sciences Scholarship (Ulowa)	2019 - 2020, 2020 - 2021
NASA Iowa Space Grant Consortium Research Fellowship	2018 - 2019, 2019 - 2020
Myrtle K. Maier Scholarship (Ulowa)	2019 - 2020
Rhodes Dunlap Award for Excellence in the First/Second Year (Ulowa)	2018 - 2019, 2019 - 2020
ICRU Academic Year Research Fellowship	2018 - 2019, 2019 - 2020
Charles A. Wert Summer Research Fund (Ulowa)	2019
UI Department of Physics & Astronomy Poster Prize	2018, 2019
ICRU Summer Research Fellowship	2018
UI Old Gold Scholarship	2017 - 2021
UI Top Scholars Award	2017 - 2021
UI Academic Success Scholarship	2017 - 2021
CLAS Undergraduate Scholarship (Ulowa)	2018 - 2019
Stanley Merit-Based Study Abroad Scholarship (Ulowa)	2019
Ann Morse Study Abroad Grant (Ulowa)	2019
Iowa Abroad Scholarship	2019
President's List, University of Iowa	2020 - 2021
Dean's List, University of Iowa	2017 - 2021

Academic Presentations (selected)

Oral presentations:

1. Observing the Universe at Millimetre Wavelengths, "*Characterizing the dynamics of galaxy cluster mergers with multi-wavelength observations and hydrodynamical simulations*", Grenoble, FR. June 2023.
2. Caltech Observational Cosmology Seminar, "*Characterizing the dynamics of galaxy cluster mergers with multi-wavelength observations and hydrodynamical simulations*", Pasadena, CA. February 2023.
3. Galaxy Cluster Discussion Group Meeting – Center for Astrophysics, Harvard & Smithsonian, "*Characterizing the dynamics of galaxy cluster mergers with multi-wavelength observations and hydrodynamical simulations*", Virtual. November 2022.
4. 240th American Astronomical Society (AAS) Meeting, "*Characterizing the dynamics of galaxy cluster mergers with multi-wavelength observations and hydrodynamical simulations*", Pasadena, CA. June 2022.
5. University of Iowa Department of Physics & Astronomy Awards Colloquium, "*A Search for the 3.5 keV Line from the Milky Way's Dark Matter Halo with HaloSat*", Virtual. April 2021.
6. University of Iowa Department of Physics & Astronomy Colloquium, "*A Search for Dark Matter with HaloSat*", Virtual. October 2020.

7. Gulf Coast Undergraduate Research Symposium, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Virtual. October 2020.
8. NASA/GSFC Code 660 Intern Presentation Symposium, “*A Search for Dark Matter with HaloSat*”, Virtual. August 2020.
9. Iowa Space Grant Consortium Student Research Symposium, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Virtual. April 2020.
10. Conference for Undergraduate Women in Physical Sciences, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Lincoln, NE. November 2019.
11. University of Iowa Astrophysics & Space Physics Seminar, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Iowa City, IA. October 2019.

Poster presentations:

1. STScI Galaxy Clusters 2022: Challenging Our Cosmological Perspectives, “*Characterizing the dynamics of galaxy cluster mergers with multi-wavelength observations and hydrodynamical simulations*”, Virtual. April 2022.
2. 237th American Astronomical Society (AAS) Meeting, “*A Search for Dark Matter with HaloSat*”, Virtual. January 2021.
3. American Physical Society (APS) April Meeting, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Virtual. April 2020.
4. Iowa Space Grant Consortium Student Research Symposium, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Virtual. April 2020.
5. APS Conference for Undergraduate Women in Physics, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Minneapolis, MN. January 2020.
6. ICRU Fall Undergraduate Research Festival, “*HaloSat Observations of the Vela and Puppis A Supernova Remnants*”, Iowa City, IA. November 2019.
7. ICRU Fall Undergraduate Research Festival, “*HaloSat: a CubeSat Mission in Search of Missing Baryons*”, Iowa City, IA. November 2018.
8. Conference for Undergraduate Women in Physical Sciences, “*HaloSat: a CubeSat Mission in Search of Missing Baryons*”, Lincoln, NE. October 2018.

Computer Skills

Languages	Python, R, HTML
Applications	Xspec/PyXspec, \LaTeX , CIAO/Sherpa, IRAF/dsimulator, SLURM, Keck Remote Observing Software (DEIMOS, LRIS), yt, SpecPro, Pypelt, CASA, ds9
Operating Systems	macOS, Linux, Windows

Outreach

Lectures & speaking engagements:

1. Caltech stargazing lectures, “*Galaxy Clusters Collide: The Most Energetic Events since the Big Bang*”, Pasadena, CA. August 2023. Watch here: https://www.youtube.com/watch?v=X2.5uiAL_vE
2. Death Valley NP Dark Sky Festival, “*Ask an Astrophysicist*” Q&A panelist, DVNP, CA. March 2023.

Volunteering:

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| 1. Astronomy on Tap – Los Angeles | Volunteer & telescope operator // 2022 - |
| 2. Caltech stargazing lectures & public observing | Telescope operator // 2022 - |
| 3. Gabrielino High School physics classrooms | Guest lab assistant & speaker // 2021 - |

4. Girl Scouts Troop 6371 (Monrovia, CA)	Guest speaker	//	2023
5. Death Valley NP Dark Sky Festival	Science booth & telescope operator	//	2022, 2023
6. Astrobites	Guest author	//	2021
7. Iowa Center for Research by Undergraduates	Research ambassador	//	2020 - 2021
8. Society of Physics Students	Vice president & secretary	//	2017 - 2021
9. Van Allen Observatory public observing	Volunteer & telescope operator	//	2017 - 2021
10. Drexler Middle School FIRST Lego League	Team mentor	//	2018