

ANNA LORRAINE ROSEN, PH.D.

anna.rosen@cfa.harvard.edu \diamond www.anna-rosen.com

Institute for Theory and Computation, Center for Astrophysics | Harvard & Smithsonian, Cambridge MA 02138

EDUCATION

Ph.D., Astronomy & Astrophysics, University of California, Santa Cruz 2017
Advisors: Mark Krumholz, Enrico Ramirez-Ruiz
M.S., Astronomy & Astrophysics, University of California, Santa Cruz 2012
B.A., Physics & Astrophysics, University of California, Berkeley 2009
Cumulative GPA: 3.81/4.0 , Major GPA: 3.82/4.0, Honors: Fall 2007-2009, General Distinction
Community College Transfer Student, Los Angeles Pierce College 2007
Cumulative GPA: 3.95/4.0 , Major GPA: 4.0/4.0
Dean's Honors: 2003-2007, President's Honor: 2004-2007

AWARDS AND RESEARCH POSITIONS

Institute for Theory and Computation (ITC) Post-doctoral Fellowship, Harvard University 2020-2022
NASA Einstein Post-doctoral Fellowship, Harvard University 2017-2020
NASA Hubble Post-doctoral Fellowship (declined) 2017
Rodger Doxsey Dissertation Prize (American Astronomical Society) 2017
ARCS Foundation Fellowship 2016
American Association of University Women (AAUW) American Dissertation Year Fellowship 2016
Excellence in Mentoring Award (UC Santa Cruz Astronomy & Astrophysics Department) 2015
American Astronomical Society International Travel Grant 2014, 2016, 2017
National Science Foundation Graduate Research Fellowship Program 2011
Daniel Edward Wark Memorial Scholarship (UC Berkeley Astrophysics Department) 2009
NASA Motivating Undergraduates in Science and Technology Scholarship 2007
Alexander Frolich Award for excellence of achievement in Physics 2007
NASA JPL Undergraduate Scholars Award for excellence of achievement in Physics 2007
Thomas McCutcheon Award for excellence of achievement in Mathematics 2006

SUCCESSFUL PROPOSALS

Total of grants obtained as Principal Investigator: \$174,825

1. Co-I, Chandra Observation, Cycle 21 (awarded 100 ks) 2019
Title: *A Superstar Cluster is Born: Probing the X-ray Emission of H72.97-69.39 in LMC-N79*
2. PI, Chandra Theory, Cycle 16 2014
Title: *To Leak or Not to Leak: Where are the Missing X-ray Photons from Massive Star Clusters?*
3. PI, Hubble Archival, Cycle 21 2013
Title: *Simulating the Birth of Massive Star Clusters: Is Destruction Inevitable?*

TECHNICAL SKILLS

Computer Languages	C++, Fortran, IDL, Python, R, MPI
Simulation Codes	ORION2, GIZMO
Analysis Codes	<i>yt</i> , RADMC-3D, GLUE

ADVISING EXPERIENCE

Graduate Students:

- Grace Olivier (grad student at OSU), 2020-current*
Evolution of Stellar Feedback in H II Regions
- Michael Foley (grad student at Harvard), 2018-2019*
Bubbles around Intermediate and High-mass Stars due to Wind Feedback
- Hope Chen (grad student at Harvard), 2018-2019
Effects of an Embedded B-Star Wind in Ophiuchus

Undergraduate Students:

- Mikayla Wilson (physics & astronomy undergrad at TCU), Banneker Intern at Harvard 2020-current*
Tracing the Evolution of Molecular Outflows in Massive Star Formation
- Monica Gallegos-Garcia (now astro grad at Northwestern), Banneker Intern at Harvard 2018-2020*
Winds in Star Clusters Drive Kolmogorov Turbulence
- Courtney Bishop (physics undergrad at College of William & Mary), SAO NSF REU program 2018
Comparing Molecular Line Tracers in Outflows Generated by Massive Star Formation
- Evan Carter (physics undergrad at UCSC, then astro masters student at Wesleyan), 2014-2016
Synthetic Observations of Low-Mass Star Formation: Implications for Current SED-Fitting Methods

High School Students:

- Shreya Karri 2019
Census of Stellar Feedback in the Milky Way

* Denotes students whose project or contribution led to or will soon lead to a refereed publication

SERVICE EXPERIENCE

- NASA JWST Cycle 1 Panelist 2021
- Member, Harvard Astronomy Diversity, Equity, and Inclusion (DEI) Committee 2021-Present
- Member, CfA Inclusion, Diversity, and Equity in Astronomy (CfA-IDEA) Committee 2020-Present
- Referee for A&A, ApJ, MNRAS, & RAA
- CfA Galaxies & Cosmology Seminar Organizer 2019-Present
- NASA Theory Astrophysics Program Panelist 1 year
- NASA Earth and Space Science Fellowship (NESSF) Reviewer 2019
- Organizer, Equity & Inclusion Journal Club, Harvard-Smithsonian CfA 2018-2019
- Proposal Reviewer for the Czech Science Foundation 2018
- ITC Post-doctoral Fellowship Committee Member, Harvard-Smithsonian CfA 1 year
- SOC/LOC Member for Harvard-Heidelberg Star Formation meeting, 2017, 2019 (Chair)
Harvard-Smithsonian CfA
- Organizer, Diverse Topics in Astronomy Lecture Series, Lamat REU Program, UCSC 2015, 2016
- Organizer, Space Telescope Proposal Writing Workshop, 2015
UCSC Astronomy & Astrophysics Department
- Member of the LAMAT Research Internship Admissions Committee 2014
- Undergraduate Student Mentor, UCSC Women in Physics Group 2013-2017
- Graduate Student Mentor, UCSC Astronomy & Astrophysics Department 2012-2013, 2016-2017
- Astronomy Graduate Student Representative, UCSC Graduate Student Association 2012-2013
- Organizer, Applying to the NSF GRFP Workshop, 2012-2016
UCSC Astronomy & Astrophysics Department

TEACHING EXPERIENCE

- Co-Instructor, Python Programming Bootcamp, Lamat Program, UCSC 2015
- Activity Designer/Facilitator, Institute for Science & Engineering Educators 2011
Professional Development Program (PDP), Hartnell College

Teaching Assistant, “Astronomy 2: Overview of the Universe”, UCSC	2010
Grader, “Astronomy C161: Relativistic Astrophysics & Cosmology”, UC Berkeley	2010
Undergraduate Student Instructor, “Astronomy C10: Introduction to Astronomy”, UC Berkeley	2009

PROFESSIONAL DEVELOPMENT

Diversity & Inclusion Certificate Program, UCSC Office for Diversity, Equity, and Inclusion	2017
Institute for Science & Engineering Educators, PDP for Inquiry-based Education, UCSC	2011
Astronomy 300: Instruction Techniques in General Astronomy (course), UC Berkeley	2009

REFEREED PUBLICATIONS (7 1ST-AUTHORED PUBLICATIONS)

1. “Evolution of Stellar Feedback in H II Regions”
Olivier, G.M., Lopez, L.A., **Rosen, A. L.**, Nayak, O., Reiter, M., Krumholz, M. R., Bolatto, A.D., *Astrophysical Journal*, 908, 68, [NASA ADS](#)
2. “Continuity of Accretion from Clumps to Class 0 High-Mass Protostars”
Avison, A., Fuller, G.A., N. Peretto, N., Duarte-Cabral, A., **Rosen, A.L.**, Traficante, A., Pineda, J.E., Güsten, R., & Cunningham, N., 2020, *Astronomy & Astrophysics*, 645, A142, [NASA ADS](#)
3. “Winds in Star Clusters Drive Kolmogorov Turbulence”
Gallegos-Garcia, M., Burkhart, B., **Rosen, A.L.**, Naiman, J.P., Ramirez-Ruiz, E., 2020, *Astrophysical Journal Letters*, 899, 30, [NASA ADS](#)
4. “The Role of Outflows, Radiation Pressure, and Magnetic Fields in Massive Star Formation”
Rosen, A. L., Krumholz, M. R., 2020, *Astronomical Journal*, 160, 78, [NASA ADS](#)
5. “Zooming in on Individual Star Formation: Low- and High-mass Stars”
Rosen, A.L., Offner, S.S.R., Sadavoy, S.I., Bhandare, A., Vázquez-Semadeni, Ginsburg, A., 2020, *Space Science Reviews*, 216, 62, [NASA ADS](#)
6. “Formation and Evolution of Disks Around Young Stellar Objects”
Zhao, B, Tomida, K, Hennebelle, P., Tobin, J.J., Maury, A., Hirota, T., Sánchez-Monge, Á., Kuiper, R., **Rosen, A.**, Bhandare, A., Padovani, M., Lee, Y., 2020, *Space Science Reviews*, 216, 43, [NASA ADS](#)
7. “Circumbinary Disks: Accretion and Torque as a Function of Mass Ratio and Disk”
Duffell, P.C., D’Orazio, D., Derdzinski, A., Haiman, Z., MacFayden, A., **Rosen, A.L.**, & Zrake, J., 2020, *Astrophysical Journal*, 901, 25, [NASA ADS](#)
8. “Massive Star Formation via the Collapse of Subvirial and Virialized Turbulent Massive Cores”
Rosen, A.L., Li, P.S., Zhang, Q., Burkhart, B., 2019, *Astrophysical Journal*, 887, 108, [NASA ADS](#)
9. “unyt: Handle, manipulate, and convert data with units in Python”
Goldbaum, N.J., ZuHone, J.A., Turk, M.J., Kowalik, K., & **Rosen, A.L.**, 2018, *Journal of Open Source Software*, 3, 28, 809; [NASA ADS](#)
10. “Hybrid Adaptive Ray-Moment Method (HARM²): A Highly Parallel Method for Radiation Hydrodynamics on Adaptive Grids”
Rosen, A. L., Krumholz, M. R., Oishi, J.S., Lee, A.T., & Klein, R.I., 2017, *Journal of Computational Physics*, 330, 924; [NASA ADS](#)
11. “An Unstable Truth: How Massive Stars get their Mass”
Rosen, A. L., Krumholz, M. R., McKee, C.F., & Klein, R.I., 2016, *Monthly Notices of the Royal Astronomical Society*, 463, 2553; [NASA ADS](#)
12. “Gone with the Wind: Where is the Missing Stellar Wind Energy from Massive Star Clusters?”
Rosen, A. L., Lopez, L.A., Krumholz, M. R., & Ramirez-Ruiz, E.; 2014, *Monthly Notices of the Royal Astronomical Society*, 442, 2701; [NASA ADS](#)
13. “What Sets the Initial Rotation Rates of Massive Stars?”
Rosen, A. L., Krumholz, M. R., & Ramirez-Ruiz, E.; 2012, *Astrophysical Journal*, 748, 97; [NASA ADS](#)

SELECTED SCIENTIFIC PRESENTATIONS

Given **25** invited talks and **31** contributed talks to date, including

1. Invited Colloquium; Rice University Physics & Astronomy Colloquium; Houston, TX 2021
2. Invited Colloquium; University of Chicago Astronomy & Astrophysics Colloquium; Chicago, IL 2021
3. Invited Talk, Tuesday Lunch Seminar; UCLA Astronomy Department; Los Angeles, CA 2020
4. Invited Review, Radiation Hydrodynamics: Implementation and Application; Royal Astronomical Society; London, UK 2020
5. Invited Talk, Astronomy Seminar, Rutgers University Physics & Astronomy Department; Piscataway, NJ 2019
6. Invited Review, International Space Science Institute (ISSI), Star Formation Workshop; Bern, Switzerland 2019
7. Invited Talk, Gas Fueling of Galaxy Structures Across Cosmic Time, Astro 3D Workshop; Barossa Valley, South Australia 2018
8. Invited Colloquium, University of Florida Astronomy Department; Gainesville, FL 2018
9. Invited Review, Stars Birth & Death: GMT Community Science Meeting; Honolulu, HI 2018
10. Invited Talk, Astrophysical Shocks Meeting, AIP Potsdam; Potsdam, Germany 2018
11. Invited Colloquium, University of Massachusetts Amherst Astronomy Department; Amherst, MA 2017

PUBLIC OUTREACH

- Panelist, “Meet a Scientist” Panel for Women’s History Month, Marin Community College 2021
- Panelist, “Writing an Effective Proposal” presented to Harvard Graduate Students 2020
- Interviewee, “How to Make Stars on a (super)Computer,” 2020
- Astrochats Interview hosted by MicroObservatory, [Link to YouTube video](#)
- Speaker, “How to Make Massive Stars on a (super)Computer,” Astronomy on Tap Boston Event 2020
- Presenter, “Visualizing Numerical Simulations with *yt*” Center for Astrophysics | Harvard & Smithsonian *Demofest* 2019
- Speaker, “How to Make Stars on a (super)Computer,” Women in Science and Engineering (WiSE) Science on Tap Event 2017
- Speaker, “An Unstable Truth: How Massive Stars get their Mass,” AAUW Monterey Peninsula Chapter Meeting 2017
- Speaker, “How to Write an Effective Abstract,” Lamat REU Program, UCSC 2016
- Organizer and Panelist, “Astronomy Grad Student and Post-doc Panel,” Lamat REU Program, UCSC 2016
- Speaker, “Then and Now: From North Hills Prep to a Ph.D. in Astrophysics,” North Hills Prep School 2016
- Astronomy Outreach Activity, Expanding Your Horizons Workshop for Young Girls, Hartnell College 2015
- Speaker, “How to Make Stars on a (super)Computer,” UCSC, Monterey Astronomy Club, Scotts Valley High School 2015
- Speaker, “Computational Astrophysics”, Stanford Pre-collegiate Summer Courses, Stanford 2015
- Speaker, “Star Formation and Stellar Feedback”, Lamat Research Experience 2015, 2016

for Undergraduates (REU) Program, UCSC
Speaker, "Reading Scientific Literature," Lamat REU Program, UCSC 2015
Graduate Student Panelist, Advancement Via Individual Determination (AVID) Program,
Soquel High School 2015
Women in Science & Engineering (WiSE) Astronomy Education Outreach Presentation,
Seaside High School 2014
Panelist, STEM Diversity Professional Development Workshop Series, UCSC 2014
Author, www.astrobites.org, [Link to my articles](#) 2011-2013
WiSE Education Outreach Presentation, Santa Cruz High School 2011
Panelist, Girls Scouts "Girls Go Tech" Event, NASA Ames, Moffatt Field, CA 2011