ANNA LORRAINE ROSEN, PH.D.

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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	*yt*, 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*
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

Panelist, "Writing an Effective Proposal" presented to Harvard Graduate Students *2020*
CfA Inclusion, Diversity, and Equity in Astronomy (CfA-IDEA) Committee Member *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* (accepted), 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* (accepted), 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 (HARM^2): 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 **24** invited talks and **31** contributed talks to date, including

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

PUBLIC OUTREACH

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," *2016*
Lamat REU Program, UCSC

Speaker, "Then and Now: From North Hills Prep to a Ph.D. in Astrophysics," *2016*
North Hills Prep School

Astronomy Outreach Activity, Expanding Your Horizons Workshop for Young Girls, *2015*
Hartnell College

Speaker, "How to Make Stars on a (super)Computer," *2015*
UCSC, Monterey Astronomy Club, Scotts Valley High School

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, *2015*
Soquel High School

Women in Science & Engineering (WiSE) Astronomy Education Outreach Presentation, *2014*
Seaside High School

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*