

Mark Reuben Krumholz

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PROFESSIONAL APPOINTMENTS

Dec 2015 - present	Full Professor (Level E) <i>Research School of Astronomy and Astrophysics, Australian National University</i> Associate Director, Academic (2016-2018) Associate Director, Education (2018-present)
Sep 2012 - Dec 2015	Associate Professor (with tenure) <i>Astronomy and Astrophysics Department, University of California, Santa Cruz</i>
Aug 2008 - Aug 2012	Assistant Professor <i>Astronomy and Astrophysics Department, University of California, Santa Cruz</i>
Aug 2005 - Jul 2008	Hubble, Spitzer, and Council on Science and Technology Postdoctoral Fellow <i>Department of Astrophysical Sciences, Princeton University</i>

EDUCATION

Aug 2005	Doctor of Philosophy, Physics <i>University of California, Berkeley</i> Mary Elizabeth Uhl Prize for best PhD thesis in astrophysics
May 2000	Master of Arts, Physics <i>University of California, Berkeley</i>
Jun 1998	Bachelor of Arts, Physics with Certificate in Applied and Computational Mathematics <i>Princeton University</i> Summa cum laude Kusaka Memorial Prize for excellence in physics

AWARDS AND HONOURS

2018	Australian Research Council Future Fellowship
2016	Hunstead Lectureship, Sydney Institute for Astronomy, University of Sydney
2015	Blaauw Professorship, Kapteyn Astronomical Institute, University of Groningen
2015	Benjamin Dean Lecturer, California Academy of Sciences
2013	Helen B. Warner Prize, American Astronomical Society
2010	National Science Foundation CAREER award
2009	Alfred P. Sloan Research Fellowship
2007	Kavli / National Academy of Sciences / JSPS Frontiers Fellow
2006	Princeton University Society of Fellows membership (declined)
2005	Hubble Postdoctoral Fellowship
2005	NSF Postdoctoral Fellowship (declined)
2005	Lyman Spitzer, Jr. Postdoctoral Fellowship
2005	Council on Science and Technology Fellowship (Princeton University)

BOOKS

1. **Krumholz, M. R.** 2017, *Star Formation*, World Scientific Publishing: Singapore (528 pages), ISBN 978-981-3142-02-2.

MAJOR REVIEWS (REFEREED)

7. **Krumholz, M. R.**, McKee, C. F., & Bland-Hawthorn, J. 2019, “Star Clusters Across Cosmic Time”, *Annual Reviews of Astronomy & Astrophysics*, in press, arXiv:1812.01615.
6. **Krumholz, M. R.** 2015, “The Formation of Very Massive Stars”, in *Very Massive Stars in the Local Universe*, ed. J. S. Vink, Springer, 412, 43.
5. Dobbs, C. L., **Krumholz, M. R.**, Ballesteros-Paredes, J., Bolatto, A., Fukui, Y., Heyer, M., Mac Low, M.-M., Ostriker, E. C., & Vazquez-Semadeni, E. 2014, “Formation of Molecular Clouds and Global Conditions for Star Formation”, in *Protostars & Planets VI*, eds. H. Beuther, R. Klessen, C. Dullemond, Th. Henning, U. of Arizona Press, pp. 3-26.
4. **Krumholz, M. R.**, Bate, M. R., Arce, H. G., Dale, J. E., Gutermuth, R., Klein, R. I., Li, Z.-Y., Nakamura, F., & Zhang, Z. 2014, “Star Cluster Formation and Feedback”, in *Protostars & Planets VI*, eds. H. Beuther, R. Klessen, C. Dullemond, Th. Henning, U. of Arizona Press, pp. 243-266.
3. Tan, J. C., Beltran, M. T., Caselli, P., Fontani, F., Fuente, A., **Krumholz, M. R.**, McKee, C. F., & Stolte, A. 2014, “Massive Star Formation”, in *Protostars & Planets VI*, eds. H. Beuther, R. Klessen, C. Dullemond, Th. Henning, U. of Arizona Press, pp. 149-172.
2. **Krumholz, M. R.** 2014, “The Big Problems in Star Formation: the Star Formation Rate, Stellar Clustering, and the Initial Mass Function”, *Physics Reports*, 539, 49.
1. Klessen, R., **Krumholz, M. R.**, & Heitsch, F. 2011, “Numerical Star-Formation Studies – A Status Report”, *Advanced Science Letters*, 4, 258.

REFEREED JOURNAL ARTICLES

* indicates an author was a student or postdoc under MRK’s direct supervision

155. Gentry, E. S.*, **Krumholz, M. R.**, Madau, P., & Lupi, A. 2019, “The momentum budget of clustered supernova feedback in a 3D, magnetised medium”, *Monthly Notices of the Royal Astronomical Society*, 483, 3647.
 154. Popping, G., Narayanan, D., Somerville, R., Faist, A. L., & **Krumholz, M. R.** 2019, “The art of modeling CO, [C I], and [C II] in cosmological galaxy formation models”, *Monthly Notices of the Royal Astronomical Society*, 482, 4906.
 153. **Krumholz, M. R.**, Adamo, A., Fumagalli, M., & Calzetti, D. 2019, “SLUG IV: a novel forward-modelling method to derive the demographics of star clusters”, *Monthly Notices of the Royal Astronomical Society*, 482, 3550.
- 2018 —
152. Armillotta, L.*, **Krumholz, M. R.**, & Fujimoto, Y.* 2018, “Mixing of metals during star cluster formation: statistics and implications for chemical tagging”, *Monthly Notices of the Royal Astronomical Society*, 481, 5000.
 151. Crocker, R. M.*, **Krumholz, M. R.**, Thompson, T. A., Baumgardt, H., & Mackey, D. 2018, “Radiation Pressure Limits on the Star Formation Efficiency and Surface Density of Compact Stellar Systems”, *Monthly Notices of the Royal Astronomical Society*, 481, 4895.
 150. Li, Q., Narayanan, D., Davè, R., & **Krumholz, M. R.** 2018, “Dark Molecular Gas in Simulations of $z \sim 0$ Disk Galaxies”, *The Astrophysical Journal*, 869, 73.
 149. Gallagher, M., *et al.* 2018, “Do Spectroscopic Dense Gas Fractions Track Molecular Cloud Surface Densities?”, *The Astrophysical Journal*, 868, L38.
 148. Grasha, K., *et al.* 2018, “Connecting young star clusters to CO molecular gas in NGC 7793 with ALMA-LEGUS”, *Monthly Notices of the Royal Astronomical Society*, 481, 1016.
 147. Fujimoto, Y.*, **Krumholz, M. R.**, & Tachibana, S. 2018, “Short-lived radioisotopes in meteorites from Galactic-scale correlated star formation”, *Monthly Notices of the Royal Astronomical Society*, 480, 4025.

146. **Krumholz, M. R.** 2018, “Resolution Requirements and Resolution Problems in Simulations of Radiative Feedback in Dusty Gas”, *Monthly Notices of the Royal Astronomical Society*, 480, 3468.
145. Ashworth, G., Fumagalli, M., Adamo, A., & **Krumholz, M. R.** 2018, “Theoretical predictions for IMF diagnostics in UV spectroscopy of star clusters”, *Monthly Notices of the Royal Astronomical Society*, 480, 3091.
144. Guszejnov, D., Hopkins, P. F., Grudić, **Krumholz, M. R.**, & Federrath, C. 2018, “Isothermal Fragmentation: Is there a low-mass cut-off?”, *Monthly Notices of the Royal Astronomical Society*, 480, 182.
143. Micha lowski, M. J., *et al.* 2018, “Molecular gas masses of gamma-ray burst host galaxies”, *Astronomy & Astrophysics*, 617, A143.
142. Onus, A.* , **Krumholz, M. R.**, & Federrath, C. 2018, “Numerical calibration of the HCN-star formation correlation”, *Monthly Notices of the Royal Astronomical Society*, 479, 1702.
141. Jeffreson, S. M. R., Kruijssen, J. M. D., **Krumholz, M. R.**, & Longmore, S. N. 2018, “On the physical mechanisms governing the cloud lifecycle in the Central Molecular Zone of the Milky Way”, *Monthly Notices of the Royal Astronomical Society*, 478, 3380.
140. Crocker, R. M.* , **Krumholz, M. R.**, Thompson, T. A., & Clutterbuck, J. 2018, “The maximum flux of star-forming galaxies”, *Monthly Notices of the Royal Astronomical Society*, 478, 81.
139. Wibking, B. D., Thompson, T. D., & **Krumholz, M. R.** 2018, “Radiation pressure in galactic disks: stability, turbulence, and winds in the single-scattering limit”, *Monthly Notices of the Royal Astronomical Society*, 477, 4665.
138. Padnos, D., Mandelker, N., Birnboim, Y., Dekel, A., **Krumholz, M. R.**, & Sternberg, E. 2018, “Instability of Supersonic Cold Streams Feeding Galaxies II. Nonlinear Evolution of Surface and Body Modes of Kelvin-Helmholtz Instability”, *Monthly Notices of the Royal Astronomical Society*, 477, 3293.
137. **Krumholz, M. R.**, Burkhardt, B., Forbes, J. C., & Crocker, R. M.* 2018, “A unified model for galactic discs: star formation, turbulence driving, and mass transport”, *Monthly Notices of the Royal Astronomical Society*, 477, 2716.
136. Cunningham, A. J., **Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2018, “The effects of magnetic fields and protostellar feedback on low-mass cluster formation”, *Monthly Notices of the Royal Astronomical Society*, 476, 771.
135. Gallagher, M. J., *et al.* 2018, “Dense Gas, Dynamical Equilibrium Pressure, and Star Formation in Nearby Star-forming Galaxies”, *The Astrophysical Journal*, 858, 90.
134. Cormier, D., *et al.* 2018, “Full-disc $^{13}\text{CO}(1-0)$ mapping across nearby galaxies of the EMPIRE survey and the CO-to- H_2 conversion factor”, *Monthly Notices of the Royal Astronomical Society*, 475, 3909.
133. Sabbi, E., *et al.* 2018, “The resolved stellar populations in the LEGUS galaxies”, *The Astrophysical Journal Supplement Series*, 235, 23.
132. Kahre, L., *et al.* 2018, “Extinction Maps and Dust-to-Gas Ratios in Nearby Galaxies with LEGUS”, *The Astrophysical Journal*, 855, 133.
131. **Krumholz, M. R.**, & Ting, Y. S. 2018, “Metallicity Fluctuation Statistics in the Interstellar Medium and Young Stars. I. Variance and Correlation”, *Monthly Notices of the Royal Astronomical Society*, 475, 2236.
130. Birnboim, Y., Federrath, C., & **Krumholz, M. R.** 2018, “Compression of Turbulent Magnetised Gas in Giant Molecular Clouds”, *Monthly Notices of the Royal Astronomical Society*, 473, 2144.

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129. **Krumholz, M. R.**, Thompson, T. A., Ostriker, E. C., & Martin, C. L. 2017, “The Observable Properties of Cool Winds from Galaxies, AGN, and Star Clusters. I. Theoretical Framework”, *Monthly Notices of the Royal Astronomical Society*, 471, 4061.
128. Issaoun, S., Goddi, C., Matthews, L. D., Greenhill, L. J., Gray, M. D., Humphreys, E. M. L., Chandler, C. J., **Krumholz, M. R.**, & Falcke, H. 2017, “VLBA imaging of the 3mm SiO maser emission in the disk-wind from the massive protostellar system Orion Source I”, *Astronomy & Astrophysics*, 606, A26.
127. Ashworth, G., *et al.* 2017, “Exploring the IMF of star clusters: a joint SLUG and LEGUS effort”, *Monthly Notices of the Royal Astronomical Society*, 469, 2464.

126. Guszejnov, D., Hopkins, P. F., & **Krumholz, M. R.** 2017, “Protostellar Feedback in Turbulent Fragmentation: Consequences for Stellar Clustering and Multiplicity”, *Monthly Notices of the Royal Astronomical Society*, 468, 4093.
125. Grasha, K., *et al.* 2017, “Hierarchical Star Formation in Turbulent Media: Evidence from Young Star Clusters”, *The Astrophysical Journal*, 842, 25.
124. Adamo, A., *et al.* 2017, “Legacy ExtraGalactic UV Survey with The Hubble Space Telescope. Stellar cluster catalogues and first insights into cluster formation and evolution in NGC 628”, *The Astrophysical Journal*, 841, 131.
123. Narayanan, D., & **Krumholz, M. R.** 2017, “A physical model for the [C II]-FIR deficit in luminous galaxies”, *Monthly Notices of the Royal Astronomical Society*, 467, 50.
122. **Krumholz, M. R.**, Kruijssen, J. M. D., & Crocker, R. 2017, “A Dynamical Model for Gas Flows, Star Formation, and Nuclear Winds in Galactic Centres”, *Monthly Notices of the Royal Astronomical Society*, 466, 1213.
121. Jiménez-Donaire, M. J., *et al.* 2017, “Optical depth estimates and effective critical densities of dense gas tracers in the inner parts of nearby galaxy discs”, *Monthly Notices of the Royal Astronomical Society*, 466, 49.
120. Gentry, E. S.*, **Krumholz, M. R.**, Dekel, A., & Madau, P. M. 2017, “Enhanced momentum feedback from clustered supernovae”, *Monthly Notices of the Royal Astronomical Society*, 465, 2471.
119. Safranek-Shrader, C. T.*, **Krumholz, M. R.**, Kim, C.-G., Ostriker, E. C., Klein, R. I., Li, S., McKee, C. F., & Stone, J. M. 2017, “Chemistry and radiative shielding in star forming galactic disks”, *Monthly Notices of the Royal Astronomical Society*, 465, 885.
118. Rosen, A. L.*, **Krumholz, M. R.**, Oishi, J. S., Lee, A. T., & Klein, R. I. 2017, “Hybrid Adaptive Ray-Moment Method (HARM²): A Highly Parallel Method for Radiation Hydrodynamics on Adaptive Grids”, *Journal of Computational Physics*, 330, 924.
117. Jiménez-Donaire, M. J., *et al.* 2017, “¹³CO / C¹⁸O Gradients Across the Discs of Nearby Spiral Galaxies”, *The Astrophysical Journal*, 836, L29.

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116. Guo, Y., *et al.* 2016, “The Bursty Star Formation Histories of Low-mass Galaxies at $0.4 < z < 1$ Revealed by Star Formation Rates Measured from FUV and H β ”, *The Astrophysical Journal*, 833, 37.
115. Mandelker, N., Padnos, D., Dekel, A., Birnboim, Y., Burkert, A., **Krumholz, M. R.**, & Steinberg, E. 2016, “Instability of Supersonic Cold Streams Feeding Galaxies I: Linear Kelvin-Helmholtz Instability with Body Modes”, *Monthly Notices of the Royal Astronomical Society*, 463, 3921.
114. Rosen, A. L.*, **Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2016, “An Unstable Truth: How Massive Stars Get Their Mass”, *Monthly Notices of the Royal Astronomical Society*, 463, 2553.
113. **Krumholz, M. R.**, Myers, A. T., Klein, R. I., & McKee, C. F. 2016, “What physics determines the peak of the IMF? Insights from the structure of cores in radiation-magnetohydrodynamic simulations”, *Monthly Notices of the Royal Astronomical Society*, 460, 3272.
112. Goldbaum, N. J.*, **Krumholz, M. R.**, & Forbes, J. C.* 2016, “Mass Transport and Turbulence in Gravitationally-Unstable Disk Galaxies. II: The Effects of Star Formation Feedback”, *The Astrophysical Journal*, 827, 28.
111. Forbes, J. C.*, **Krumholz, M. R.**, Goldbaum, N. J.*, & Dekel, A. 2016, “Suppression of star formation in dwarf galaxies by grain photoelectric feedback”, *Nature*, 535, 523.
110. **Krumholz, M. R.**, & Burkhardt, B. 2016, “Is Turbulence in the Interstellar Medium Driven by Feedback or Gravity? An Observational Test”, *Monthly Notices of the Royal Astronomical Society*, 458, 1671.
109. Guszejnov, D., **Krumholz, M. R.**, & Hopkins, P. F. 2016, “The Necessity of Feedback Physics in Setting the Peak of the Initial Mass Function”, *Monthly Notices of the Royal Astronomical Society*, 458, 673.
108. Thompson, T. A., & **Krumholz, M. R.** 2016, “Sub-Eddington Star-Forming Regions are Super-Eddington: Momentum Driven Outflows from Supersonic Turbulence”, *Monthly Notices of the Royal Astronomical Society*, 455, 334.

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107. Goldbaum, N. J.* , **Krumholz, M. R.**, & Forbes, J. C.* 2015, “Mass Transport and Turbulence in Gravitationally-Unstable Disk Galaxies. I: The Case of Pure Self-Gravity”, *The Astrophysical Journal*, 814, 131.
106. **Krumholz, M. R.**, & Kruijssen, J. M. D. 2015, “A Dynamical Model for the Formation of Gas Rings and Episodic Starbursts Near Galactic Centres”, *Monthly Notices of the Royal Astronomical Society*, 453, 739.
105. **Krumholz, M. R.**, *et al.* 2015, “Star Cluster Properties in LEGUS Galaxies Computed with Stochastic Stellar Population Synthesis Models”, *The Astrophysical Journal*, 812, 147.
104. Calzetti, D., *et al.* 2015, “The Brightest Young Star Clusters in NGC 5253”, *The Astrophysical Journal*, 811, 75.
103. Micha lowski, M. J., *et al.* 2015, “Massive stars formed in atomic hydrogen reservoirs: HI observations of gamma-ray burst host galaxies”, *Astronomy & Astrophysics*, 582, A78.
102. Tripathi, A.* , Kratter, K. M., Murray-Clay, R., & **Krumholz, M. R.** 2015, “Simulated Photoevaporative Mass Loss from Hot Jupiters in 3D”, *The Astrophysical Journal*, 808, 173.
101. **Krumholz, M. R.**, Fumagalli, M., da Silva, R. L.* , Rendahl, T.* , & Parra, J.* 2015, “Stochastically Lighting Up Galaxies III: A Suite of Tools for Simulated Photometry, Spectroscopy, and Bayesian Inference with Stochastic Stellar Populations”, *Monthly Notices of the Royal Astronomical Society*, 452, 1447.
100. Kriek, M., *et al.* 2015, “The MOSFIRE Deep Evolution Field (MOSDEF) Survey: Rest-Frame Optical Spectroscopy For ~ 1500 H-Selected Galaxies at $1.37 < z < 3.8$ ”, *The Astrophysical Journal Supplement*, 218, 15.
99. **Krumholz, M. R.**, & Forbes, J. C.* 2015, “VADER: A Flexible, Robust, Open-Source Code for Simulating Viscous Thin Accretion Disks”, *Astronomy and Computing*, 11, 1.
98. Petit, A.* , **Krumholz, M. R.**, Goldbaum, N. J.* , & Forbes, J. C.* 2015, “Mixing and transport of metals by gravitational instability-driven turbulence in galactic discs”, *Monthly Notices of the Royal Astronomical Society*, 449, 2588.
97. Calzetti, D., *et al.* 2015, “Legacy ExtraGalactic UV Survey (LEGUS) with The Hubble Space Telescope. I. Survey Description”, *The Astronomical Journal*, 149, 51.

— 2014 —

96. da Silva, R. L.* , Fumagalli, M., & **Krumholz, M. R.** 2014, “Stochastically Lighting Up Galaxies II: Quantifying the Effects of Stochasticity on Star Formation Rate Indicators”, *Monthly Notices of the Royal Astronomical Society*, 444, 3275.
95. Lopez, L. A.* , **Krumholz, M. R.**, Bolatto, A. D., Prochaska, J. X., Ramirez-Ruiz, E., & Castro, D. 2014, “The Role of Stellar Feedback in the Dynamics of HII Regions”, *The Astrophysical Journal*, 795, 121.
94. Feng, Y.* , & **Krumholz, M. R.** 2014, “On the Origin of Chemical Homogeneity in Open Star Clusters”, *Nature*, 513, 523.
93. Forbes, J. C.* , **Krumholz, M. R.**, Burkert, A., & Dekel, A. 2014, “On the Origin of the Fundamental Metallicity Relation and the Scatter in Galaxy Scaling Relations”, *Monthly Notices of the Royal Astronomical Society*, 443, 168.
92. Andrews, J. E., *et al.* 2014, “Big Fish in Small Ponds: Massive Stars in the Low Mass Clusters of M83”, 2014, *The Astrophysical Journal*, 793, 4.
91. Rosen, A. L.* , Lopez, L. A., **Krumholz, M. R.**, & Ramirez-Ruiz, E. 2014, “Gone with the Wind: Where is the Missing Stellar Wind Energy from Massive Star Clusters?”, 2014, *Monthly Notices of the Royal Astronomical Society*, 442, 2701.
90. Narayanan, D., & **Krumholz, M. R.** 2014, “A Theory for the Excitation of CO in Star-Forming Galaxies”, *Monthly Notices of the Royal Astronomical Society*, 442, 1411.
89. Myers, A. T., Klein, R. I., McKee, C. F., & **Krumholz, M. R.** 2014, “Star Cluster Formation in Turbulent, Magnetized Dense Clumps with Radiative and Outflow Feedback”, *Monthly Notices of the Royal Astronomical Society*, 439, 3420.
88. da Silva, R. L.* , **Krumholz, M. R.**, Fumagalli, M., & Fall, S. M. 2014, “An Analytic Method to Compute Cluster Luminosity Statistics”, *Monthly Notices of the Royal Astronomical Society*, 438, 2355.
87. Forbes, J. C.* , **Krumholz, M. R.**, Burkert, A., & Dekel, A. 2014, “Balance Among Gravitational Instability, Star Formation, and Accretion Determines the Structure and Evolution of Disk Galaxies”, *Monthly Notices of the Royal Astronomical Society* 438, 1551.

86. Kim, J.-H.* , *et al.* 2014, “The AGORA High-Resolution Galaxy Simulations Comparison Project”, *The Astrophysical Journal Supplement*, 210, 14.
85. **Krumholz, M. R.** 2014, “DESPOTIC – A New Software Library to Derive the Energetics and SPectra of Optically Thick Interstellar Clouds”, *Monthly Notices of the Royal Astronomical Society*, 437, 1662.

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84. **Krumholz, M. R.** 2013, “The Star Formation Law in Molecular-Poor Galaxies”, *Monthly Notices of the Royal Astronomical Society*, 426, 2747.
83. Kim, J.-H.* , **Krumholz, M. R.**, Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T. 2013, “Dwarf Galaxies with Ionizing Radiation Feedback. II: Spatially-Resolved Star Formation Related”, *The Astrophysical Journal*, 779, 8.
82. Kuhlen, M., Madau, P., & **Krumholz, M. R.** 2013, “Dwarf Galaxy Formation with H₂-Regulated Star Formation: II. Gas-Rich Dark Galaxies at Redshift 2.5”, *The Astrophysical Journal*, 776, 34.
81. Kim, J.-H.* , **Krumholz, M. R.**, Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T. 2013, “Dwarf Galaxies with Ionizing Radiation Feedback. I: Escape of Ionizing Photons”, *The Astrophysical Journal*, 775, 109.
80. **Krumholz, M. R.**, & Thompson, T. A. 2013, “Numerical Simulations of Radiatively-Driven Dusty Winds”, *Monthly Notices of the Royal Astronomical Society*, 434, 2329.
79. Dekel, A., & **Krumholz, M. R.** 2013, “Steady Outflows in Giant Clumps of High-*z* Disk Galaxies During Migration and Growth by Accretion”, *Monthly Notices of the Royal Astronomical Society*, 432, 455.
78. Craig, J.* , & **Krumholz, M. R.** 2013, “Close Stellar Encounters in Young, Substructured, Dissolving Star Clusters: Statistics and Effects on Planetary Systems”, *The Astrophysical Journal*, 769, 150.
77. Verdolini, S.* , Yeh, S. C. C., **Krumholz, M. R.**, Matzner, C. D., & Tielens, A. G. G. M. 2013, “Line Emission from Radiation-Pressurized HII Regions: II. Dynamics and Population Synthesis”, *The Astrophysical Journal*, 769, 12.
76. Yeh, S. C. C., Verdolini, S.* , **Krumholz, M. R.**, Matzner, C. D., & Tielens, A. G. G. M. 2013, “Line Emission from Radiation-Pressurized HII Regions: I. Internal Structure and Line Ratios”, *The Astrophysical Journal*, 769, 11.
75. **Krumholz, M. R.**, Crutcher, R. M., & Hull, C. F. 2013, “Protostellar Disk Formation Enabled by Weak, Misaligned Magnetic Fields”, *The Astrophysical Journal Letters*, 767, L11.
74. Andrews, J. E., *et al.* 2013, “An IMF Study of the Dwarf Starburst Galaxy NGC 4214”, *The Astrophysical Journal*, 767, 51.
73. Myers, A. T., McKee, C. F., Cunningham, A. J., Klein, R. I., & **Krumholz, M. R.** 2013, “The Fragmentation of Massive, Magnetized Star-Forming Cores with Radiative Feedback”, *The Astrophysical Journal*, 766, 97.

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72. **Krumholz, M. R.**, & Thompson, T. A. 2012, “Direct Numerical Simulation of Radiation Pressure-Driven Turbulence and Winds in Star Clusters and Galactic Disks”, *The Astrophysical Journal*, 760, 155.
71. **Krumholz, M. R.** 2012, “Star Formation in Atomic Gas”, *The Astrophysical Journal*, 759, 9.
70. Yang, C.-C.* , & **Krumholz, M. R.** 2012, “Thermal-Instability-Driven Turbulent Mixing in Galactic Disks: I. Effective Mixing of Metals”, *The Astrophysical Journal*, 758, 48.
69. **Krumholz, M. R.**, Klein, R. I., & McKee, C. F. 2012, “Radiation-Hydrodynamic Simulations of the Formation of Orion-Like Star Clusters II. The Initial Mass Function from Winds, Turbulence, and Radiation”, *The Astrophysical Journal*, 754, 71.
68. Dukes, D.* , & **Krumholz, M. R.** 2012, “Was the Sun Born in a Massive Cluster?”, *The Astrophysical Journal*, 754, 56.
67. Forbes, J. C.* , **Krumholz, M. R.**, & Burkert, A. 2012, “Evolving Gravitationally Unstable Disks Over Cosmic Time: Implications For Thick Disk Formation”, *The Astrophysical Journal*, 754, 48.
66. **Krumholz, M. R.**, & Dekel, A. 2012, “Metallicity-Dependent Quenching of Star Formation at High Redshift in Small Galaxies”, *The Astrophysical Journal*, 753, 16.
65. Walter, F., *et al.* 2012, “The Intense Starburst HDF850.1 in a Galaxy Overdensity at $z = 5.2$ in the Hubble Deep Field”, *Nature*, 486, 233.

64. Narayanan, D., **Krumholz, M. R.**, Ostriker, E. C., & Hernquist, L. 2012, “A General Model for the CO-H₂ Conversion Factor in Galaxies with Applications to the Star Formation Law”, *Monthly Notices of the Royal Astronomical Society*, 421, 3127.
63. Kuhlen, M., **Krumholz, M. R.**, Madau, P., Smith, B., & Wise, J. 2012, “Dwarf Galaxy Formation with H₂-Regulated Star Formation”, *The Astrophysical Journal*, 749, 36.
62. Rosen, A. L.* , **Krumholz, M. R.**, & Ramirez-Ruiz, E. 2012, “What Sets the Initial Rotation Rates of Massive Stars?”, *The Astrophysical Journal*, 748, 97.
61. Gendeleev, L.* , & **Krumholz, M. R.** 2012, “Evolution of Blister-Type H II Regions in a Magnetized Medium”, *The Astrophysical Journal*, 745, 158.
60. da Silva, R. L.* , Fumagalli, M.* , & **Krumholz, M. R.** 2012, “SLUG - Stochastically Lighting Up Galaxies I: Methods and Validating Tests”, *The Astrophysical Journal*, 745, 145.
59. **Krumholz, M. R.**, Dekel, A., & McKee, C. F. 2012, “A Universal, Local Star Formation Law in Galactic Clouds, Nearby Galaxies, High-Redshift Disks, and Starbursts”, *Astrophysical Journal*, 745, 69.
58. Cunningham, A. J., McKee, C. F., Klein, R. I., **Krumholz, M. R.**, & Teyssier, R. 2012, “Radiatively Efficient Magnetized Bondi Accretion”, *The Astrophysical Journal*, 744, 185.

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57. **Krumholz, M. R.** 2011, “On the Origin of Stellar Masses”, *The Astrophysical Journal*, 743, 110.
56. Narayanan, D., **Krumholz, M. R.**, Ostriker, E. C., & Hernquist, L. 2011, “The CO-H₂ Conversion Factor in Disc Galaxies and Mergers”, *Monthly Notices of the Royal Astronomical Society*, 418, 664.
55. Fumagalli, M.* , da Silva, R. L.* , & **Krumholz, M. R.** 2011, “Stochastic Star Formation and a (Nearly) Uniform Stellar Initial Mass Function”, *Astrophysical Journal Letters*, 741, L26.
54. Cunningham, A. J., Klein, R. I., McKee, C. F., & **Krumholz, M. R.** 2011, “Radiation-Hydrodynamic Simulations of Massive Star Formation with Protostellar Outflows”, *The Astrophysical Journal*, 740, 107.
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46. Lopez, L. A.* , **Krumholz, M. R.**, Bolatto, A. D., Prochaska, J. X., & Ramirez-Ruiz, E. 2011, “What Drives the Expansion of Giant H II Regions?: A Study of Stellar Feedback in 30 Doradus”, *Astrophysical Journal*, 731, 91.

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41. Fu, J., Qi, G., Kauffman, G., & **Krumholz, M. R.** 2010, “The Atomic to Molecular Transition and its Relation to the Scaling Properties of Galaxy Disks in the Local Universe”, *Monthly Notices of the Royal Astronomical Society*, 409, 515.
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39. **Krumholz, M. R.**, & Burkert, A. 2010, “Dynamics and Evolution of Gravitational Instability-Dominated Disks”, *Astrophysical Journal*, 724, 895.
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36. **Krumholz, M. R.**, & Dekel, A. 2010, “Survival of Star-Forming Giant Clumps in High-Redshift Galaxies”, *Monthly Notices of the Royal Astronomical Society*, 406, 112.
35. **Krumholz, M. R.**, Cunningham, A. J., Klein, R. I., & McKee, C. F. 2010, “Radiation Feedback, Fragmentation, and the Environmental Dependence of the Initial Mass Function”, *Astrophysical Journal*, 713, 1120.
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33. Fall, S. M., **Krumholz, M. R.**, & Matzner, C. D., 2010, “Stellar Feedback in Molecular Clouds and its Influence on the Mass Function of Young Star Clusters”, *Astrophysical Journal Letters*, 710, L142.
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29. **Krumholz, M. R.**, & Matzner, C. D. 2009, “The Dynamics of Radiation Pressure-Dominated H II Regions”, *Astrophysical Journal*, 703, 1352.
28. Offner, S. S. R., Klein, R. I., McKee, C. F., & **Krumholz, M. R.** 2009, “The Effects of Radiative Transfer on Low-Mass Star Formation”, *Astrophysical Journal*, 703, 131.
27. **Krumholz, M. R.**, Ellison, S. L., Prochaska, J. X., & Tumlinson, J. 2009, “On the Absence of High Metallicity-High Column Density Damped Lyman Alpha Systems: Molecule Formation in a Two-Phase Interstellar Medium”, *Astrophysical Journal Letters*, 701, 12.
26. **Krumholz, M. R.**, McKee, C. F., & Tumlinson, J. 2009, “The Star Formation Law in Atomic and Molecular Gas”, *Astrophysical Journal*, 699, 850.
25. Fumagalli, M., **Krumholz, M. R.**, Prochaska, J. X., Gavazzi, G., & Boselli, A. 2009, “Detection of Molecular Hydrogen Deficiency in H I-Poor Galaxies and Implications for their Star Formation Activity”, *Astrophysical Journal*, 697, 1811.
24. Offner, S. S. R., & **Krumholz, M. R.** 2009, “The Shapes of Molecular Cloud Cores in Simulations and Observation”, *Astrophysical Journal*, 693, 914.
23. **Krumholz, M. R.**, McKee, C. F., & Tumlinson, J. 2009, “The Atomic to Molecular Transition in Galaxies. II: H I and H₂ Column Densities”, *Astrophysical Journal*, 693, 216.

22. **Krumholz**, M. R., Klein, R. I., McKee, C. F., Offner, S. S. R., & Cunningham, A. J. 2009, “The Formation of Massive Star Systems by Accretion”, *Science*, 323, 754.

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18. Kratter, K. M., Matzner, C. D., & **Krumholz**, M. R. 2008, “Global Models for the Evolution of Embedded, Accreting Protostellar Disks”, *Astrophysical Journal*, 681, 375.

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17. **Krumholz**, M. R., Stone, J. M & Gardiner, T. A. 2007, “Magnetohydrodynamic Evolution of H II Regions: Simulation Methodology, Convergence Tests, and Uniform Media”, *Astrophysical Journal*, 671, 518.
16. **Krumholz**, M. R., & Thompson, T. A. 2007, “The Relationship Between Molecular Gas Tracers and Kennicutt-Schmidt Laws”, *Astrophysical Journal*, 669, 289.
15. **Krumholz**, M. R., Klein, R. I., McKee, C. F., & Bolstad, J. 2007, “Equations and Algorithms for Mixed-Frame Flux Limited Diffusion Radiation Hydrodynamics”, *Astrophysical Journal*, 667, 626.
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11. **Krumholz**, M. R., & Tan, J. C. 2007, “Slow Star Formation in Dense Gas: Evidence and Implications”, *Astrophysical Journal*, 654, 304.

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10. **Krumholz**, M. R., Matzner, C. D., & McKee, C. F. 2006, “The Global Evolution of Giant Molecular Clouds. I: Model Formulation and Quasi-Equilibrium Behavior”, *Astrophysical Journal*, 653, 361.
9. Tan, J. C., **Krumholz**, M. R., & McKee, C. F. 2006, “Equilibrium Star Cluster Formation”, *Astrophysical Journal Letters*, 641, 121.
8. **Krumholz**, M. R. 2006, “Radiation Feedback and Fragmentation in Massive Protostellar Cores”, *Astrophysical Journal Letters*, 641, 45.
7. **Krumholz**, M. R., McKee, C. F., & Klein, R. I. 2006, “Bondi-Hoyle Accretion in a Turbulent Medium”, *Astrophysical Journal*, 638, 369.

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6. **Krumholz**, M. R., McKee, C. F., & Klein, R. I. 2005, “The Formation of Stars by Gravitational Collapse Rather Than Competitive Accretion”, *Nature*, 438, 332.
5. **Krumholz**, M. R., & McKee, C. F. 2005, “A General Theory of Turbulence-Regulated Star Formation, From Spirals to Ultraluminous Infrared Galaxies”, *Astrophysical Journal*, 630, 250.
4. **Krumholz**, M. R., McKee, C. F., & Klein, R. I. 2005, “How Protostellar Outflows Help Massive Stars Form”, *Astrophysical Journal Letters*, 618, 33.
3. **Krumholz**, M. R., McKee, C. F., & Klein, R. I. 2005, “Bondi Accretion in the Presence of Vorticity”, *Astrophysical Journal*, 618, 757.

2. **Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2004, “Embedding Lagrangian Sink Particles in Eulerian Grids”, *Astrophysical Journal*, 611, 399.
1. **Krumholz, M. R.**, Thorsett, S. E., & Harrison, F. A. 1998, “Gamma-Ray Bursts and the Cosmic Star Formation Rate,” *Astrophysical Journal Letters*, 506, 81.

INVITED CONFERENCE PROCEEDINGS (REFEREED AND NON-REFEREED)

9. Vink, J. S., Heger, A., **Krumholz, M. R.**, *et al.* 2013, “Very Massive Stars (VMS) in the Local Universe”, in “Highlights of Astronomy, Volume 16, XXVIIth IAU General Assembly”, ed. T. Montmerle, 16, 51.
8. **Krumholz, M. R.** 2011, “Star Formation in Molecular Clouds”, in “XVth Special Courses at the National Observatory of Rio de Janeiro”, eds. E. Telles, R. Dupke, & D. Lazzaro, AIP Conference Proceedings, (Melville, NY: AIP), 1386, 9.
7. **Krumholz, M. R.** 2011, “Star Formation with Adaptive Mesh Refinement Radiation Hydrodynamics” (refereed review), in “IAU Symposium 270: Computational Star Formation”, eds. B. Elmegreen, J. Girart, & V. Trimble, (Cambridge: Cambridge University Press), 270, 187.
6. **Krumholz, M. R.** 2010, “How Radiation Feedback Affects Fragmentation and the IMF”, in “Up2010: Have Observations Revealed a Variable Upper End of the Initial Mass Function?”, eds. M. Treyer, T. Wyder, D. Neill, M. Seibert, & J. Lee, ASP Conference Series, (San Francisco: ASP), 440, 91.
5. **Krumholz, M. R.** & Bonnell, I. A. 2009, “Models for the Formation of Massive Stars”, in “Structure Formation in the Universe”, in “Structure Formation in the Universe”, ed. G. Chabrier, (Cambridge: Cambridge University Press), 288.
4. **Krumholz, M. R.** 2008, “From Massive Cores to Massive Stars”, in “Pathways Through an Eclectic Universe: A Conference Celebrating John Beckman’s 40 Years of Active Research in Astrophysics”, eds. J. Knapen, T. Mahoney, & A. Vazdekis, ASP Conference Series, (San Francisco: ASP), 390, 16.
3. **Krumholz, M. R.** 2008, “Collapse, Fragmentation, and Accretion in Massive Cores”, in “Massive Star Formation: Observations Confront Theory”, eds. H. Beuther, H. Linz, and T. Henning, ASP Conference Series, (San Francisco: ASP), 387, 200.
2. **Krumholz, M. R.** 2006, “High Mass Star Formation by Gravitational Collapse of Massive Cores”, in “Proceedings of the 2006 Space Telescope Science Institute May Symposium: Massive Star Formation: From Pop III and GRBs to the Milky Way”, astro-ph/0607429.
1. **Krumholz, M. R.** 2006, “Massive Star Formation: A Tale of Two Theories”, in “New Horizons in Astronomy, Proceedings of the 2005 Frank N. Bash Symposium”, eds. S. Kannappan, S. Redfield, N. Drory, J. Kessler-Silacci, & M. Landriau, ASP Conference Series, (San Francisco: ASP), 352, 31.

CONTRIBUTED CONFERENCE PROCEEDINGS (NON-REFEREED)

8. Fumagalli, M.*, & da Silva, R.*, **Krumholz, M. R.**, & Bigiel, F. 2010, “SLUG: A New Way to Stochastically Light Up Galaxies”, in “Up2010: Have Observations Revealed a Variable Upper End of the Initial Mass Function?”, eds. M. Treyer, T. Wyder, D. Neill, M. Seibert, & J. Lee, ASP Conference Series, (San Francisco: ASP), 440, 155.
7. Kratter, K. M., Matzner, C. D., & **Krumholz, M. R.** 2008, “Embedded, Accreting Disks in Massive Star Formation”, in “Massive Star Formation: Observations Confront Theory”, eds. H. Beuther, H. Linz, and T. Henning, ASP Conference Series, (San Francisco: ASP), 387, 262.
6. **Krumholz, M. R.** 2007, “Turbulence, Feedback, and Slow Star Formation”, in “IAU Symposium 237: Triggered Star Formation in a Turbulent ISM”, eds. B. G. Elmegreen & J. Palous, IAU Symposium Series, (Cambridge: Cambridge University Press), 237, 378.
5. **Krumholz, M. R.**, Klein, R. I., & McKee, C. F. 2005, “Radiation Pressure in Massive Star Formation”, in “IAU Symposium 227: Massive Star Birth: A Crossroads of Astrophysics”, eds. R. Cesaroni, E. Churchwell, M. Felli, & C. M. Walmsley, IAU Symposium Series, (Cambridge: Cambridge University Press), 227, 231.

4. **Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2004, “Embedding Lagrangian Sink Particles in Eulerian Grids”, in “Star Formation in the Interstellar Medium, a workshop in honor of David Hollenbach, Chris McKee, and Frank Shu”, eds. F. C. Adams, D. Johnstone, D. N. C. Lin, & E. C. Ostriker, ASP Conference Series, (San Francisco: ASP), 323, 401.
3. **Krumholz, M. R.**, Fisher, R. T., Klein, R. I., & McKee, C. F. 2003, “Realistic Initial Conditions for Star Formation Simulations”, *Revista Mexicana de Astronomía y Astrofísica*, 15, 138.
2. Klein, R. I., Fisher, R. T., **Krumholz, M. R.**, & McKee, C. F. 2003, “Recent Advances in Collapse and Fragmentation of Turbulent Molecular Cloud Cores”, *Revista Mexicana de Astronomía y Astrofísica*, 15, 92.
1. Shrauner, J. A., Stairs, I. H., Dewey, R. J., **Krumholz, M. R.**, Taylor, H. E., Taylor, J. H., & Thorsett, S. E. 1996, “Mark IV: A Phase Coherent Observing System for Pulsars,” in “IAU Symposium 160: Pulsars: Problems and Progress”, eds. S. Johnson, M. A. Walker, & M. Bailes, ASP Conference Series, (San Francisco: ASP), 23.

POPULAR PRESS PUBLICATIONS

3. **Krumholz, M. R.** Review of *Parallax*, by Alan Hirshfeld, *San Francisco Bay Guardian*, Sep 1, 2001.
2. **Krumholz, M. R.** Review of *The Neptune File*, by Tom Standage, *San Francisco Bay Guardian*, Apr 1, 2001.
1. **Krumholz, M. R.** “Astronomy and its Discontents” (feature article), *San Francisco Bay Guardian*, Mar 7, 2001.

STUDENT SUPERVISION

PhD Students

- 2021 (expected) Piyush Sharda (jointly supervised with C. Federrath, M. Asplund, E. da Cunha)
- 2019 (expected) Eric Gentry (jointly supervised with P. Madau)
- 2019 (expected) Ayan Acharyya (jointly supervised with C. Federrath and L. Kewley)
- 2017 Anna Rosen (jointly supervised with E. Ramirez-Ruiz)
Thesis: *The Destructive Birth of Massive Stars and Massive Star Clusters*
- 2016 John Forbes
Thesis: *Numerical Experiments in Galactic Disks: Gravitational Instability, Stochastic Accretion, and Galactic Winds*
- 2015 Nathan Goldbaum
Thesis: *Star Formation in Gravitationally Unstable Disk Galaxies: from Clouds to Disks*
- 2014 Robert da Silva (jointly supervised with J. Xavier Prochaska)
Thesis: *Stochastically Lighting Up Galaxies: Statistical Implications of Stellar Clustering*
- 2012 Michele Fumagalli (jointly supervised with J. Xavier Prochaska)
Thesis: *Food for Stars: The Role of Hydrogen in the Formation and Evolution of Galaxies*
- 2011 Laura Lopez (jointly supervised with E. Ramirez-Ruiz and J. Xavier Prochaska)
Thesis: *The Tumultuous Lives and Deaths of Stars*

Masters Students

- 2020 (expected) Zipeng Hu
- 2018 Timothy Crundall (jointly supervised with M. Ireland)
Thesis: *Characterising the Kinematic Substructure of Young Stellar Associations: A Bayesian Analysis*

Undergraduate and Honours Students

- 2014 Theodore Rendahl
Thesis: *Stochasticity in Nebular Emission Lines*
- 2013 Jonathan Parra
Thesis: *Detecting Variations of the High Mass End of the Stellar Initial Mass Function from Unresolved Star Clusters*
- 2012 Jonathan Craig
Thesis: *Close Encounters in the Stellar Birth Cluster*
- 2011 Donald Dukes
Thesis: *Nemesis*
- 2011 Lev Gendelev
Thesis: *Evolution of Blister-Type H II Regions in a Magnetized Medium*

GRANTS AND FELLOWSHIPS

2018 - 2022	<i>The Cosmic Distribution of Metals</i> Australian Research Council Future Fellowship (FT180100375) AU\$978,125
2019 - 2021	<i>The Role of Radiation and Cosmic Rays in Galaxy Formation</i> Australian Research Council Discovery Projects (DP190101258) AU\$430,000 Chief investigator
2018 - 2019	<i>The Life Cycle of Star-Forming Regions in the Era of Next Generation Telescopes</i> Universities Australia - Deutscher Akademischer Austauschdienst AU\$18,000 Chief investigator
2016 - 2018	<i>Modeling the Distribution of Metals in the Universe</i> Australian Research Council Discovery Projects (DP160100695) AU\$389,800 Chief investigator
2015 - 2017	<i>The Origin of the Stellar Mass Spectrum in Turbulence and Feedback</i> NASA Astrophysics Theory Program US\$394,043 Principal investigator
2014 - 2016	<i>Transport of Metals in Galactic Disks and Beyond</i> NSF Astronomy & Astrophysics Research Program US\$460,107 Principal investigator
2014 - 2016	<i>From the ISM to the IMF: Multi-Scale, Multi-Physics Simulations of Star Formation</i> NASA Theoretical and Computational Astrophysics Networks US\$498,368 Principal investigator (UC Santa Cruz node)
2013 - 2014	<i>LEGUS: Legacy Extragalactic UV Survey</i> NASA / STScI HST General Observer Program US\$31,691 Co-investigator
2013 - 2014	<i>Simulating the Birth of Massive Star Clusters: Is Destruction Inevitable?</i> NASA / STScI HST Theory Program US\$119,825 Administrative principal investigator (Science PI: Anna Rosen)
2013 - 2014	<i>Tools for Stellar Population Synthesis in the Stochastic Regime</i> NASA / STScI HST Theory Program US\$80,109 Principal investigator
2012	<i>Acquisition of a High-Performance Parallel Computing Cluster for Astrophysics</i> NSF Major Research Infrastructure Program US\$910,000 Senior associate

2010 - 2015	<i>Toward a Predictive Theory of Star Formation</i> NSF CAREER Program US\$663,347 Principal investigator
2012 - 2015	<i>The Effect of Feedback on the Formation of High Mass Stars: From High Mass Cores to Massive Star Clusters</i> NASA Astrophysics Theory Program US\$92,214 Co-investigator
2011 - 2013	<i>Probing X-Ray Emission in H II Regions with Chandra</i> NASA <i>Chandra</i> Telescope Theory Program US\$60,800 Administrative principle investigator (Science PI: Laura Lopez)
2009 - 2013	Alfred P. Sloan Research Fellowship US\$50,000
2009 - 2012	<i>The Formation of High Mass Stars and their Feedback Effects</i> NASA Astrophysics Theory Program US\$85,979 Co-investigator
2008 - 2011	<i>The Hidden Lives of Massive Protostars</i> NSF Astronomy & Astrophysics Research Program US\$425,514 Principal investigator
2008 - 2010	<i>Simulating Star Formation in Space and Time</i> NASA / Jet Propulsion Laboratory <i>Spitzer</i> Theoretical Research US\$125,000 Principal investigator

PROFESSIONAL SERVICE

2011 - present	Editorial Board Member, <i>Scientific Reports</i>
2017 - 2020	Member, Australian National Computational Merit Allocation Committee
2017 - 2018	Member, Astronomy Australia Ltd. eResearch Advisory Committee
2014	Member, Committee of Visitors, Astronomy Division, National Science Foundation
2013	Director, UC High Performance AstroComputing Center (HiPACC) summer school
2013	Invited lecturer, 30th Jerusalem Winter School in Theoretical Physics , Hebrew University
2012	Invited lecturer, Science Journalism Boot Camp , UC Santa Cruz
2010	Invited lecturer, 15th Cycle of Special Courses at the National Observatory, Rio de Janeiro

COMMUNITY SERVICE

- 2009 - 2015 | Founder and Director
UC Santa Cruz Project for Inmate Education
PIE is a program I founded in which UC Santa Cruz faculty, staff, and students teach accredited community college-level classes for inmates at the Santa Cruz main jail.
- 2009 - 2015 | Founder and Director
Princeton Prison Teaching Initiative
PTI is a volunteer program I founded through which Princeton University faculty, staff, and students teach accredited college classes to New Jersey prison inmates.
- 1998 - 2005 | Advisory Board Member | Director of Science Instruction
Prison University Project
PUP is a non-profit organisation that provides free, accredited community college education to inmates at San Quentin State Prison, in San Quentin, CA. PUP was awarded the National Humanities Medal by President Barack Obama in 2016.