

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 (SELECTED)

2019	Humboldt Research Award, Alexander von Humboldt Foundation
2019	Anne Green Prize, Astronomical Society of Australia
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 (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)

8. **Krumholz, M. R.**, McKee, C. F., & Bland-Hawthorn, J. 2019, “Star Clusters Across Cosmic Time”, *Annual Reviews of Astronomy & Astrophysics*, 57, 227.
7. **Krumholz, M. R.**, & Federrath, C. 2019, “The Role of Magnetic Fields in Setting the Star Formation Rate and the Initial Mass Function”, *Frontiers in Astronomy and Space Sciences*, 6, 7.
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 author is a student or postdoc who was under MRK’s direct supervision

174. Sharda, P.* , Federrath, C., & **Krumholz, M. R.** 2020, “The importance of magnetic fields for the initial mass function of the first stars”, submitted to *Monthly Notices of the Royal Astronomical Society*, arXiv:2002.11502.
173. **Krumholz, M. R.**, Ireland, M. J., & Kratter, K. M. 2020, “Dynamics of small grains in transitional discs”, submitted to *Monthly Notices of the Royal Astronomical Society*, arXiv:1912.06788.
172. Haydon, D. T., Kruijssen, J. M. D., Hygate, A. P. S., Schrubba, A., **Krumholz, M. R.**, Chevance, M., & Longmore, S. N. 2020, “An uncertainty principle for star formation - III. The characteristic emission time-scales of star formation rate tracers”, submitted to *Monthly Notices of the Royal Astronomical Society*, arXiv:1810.10897.
171. Acharyya, A.* , **Krumholz, M. R.**, Federrath, C., Kewley, L. J., Goldbaum, N. J.* , & Sharp, R. 2020, “Quantifying the effects of spatial resolution and noise on galaxy metallicity gradients”, *Monthly Notices of the Royal Astronomical Society*, in press, arXiv:2004.09482.
170. Roy, A.* , Sutherland, R. S., **Krumholz, M. R.**, Heger, A., & Dopita, M. A. 2020, “Helium and nitrogen enrichment in massive main-sequence stars: mechanisms and implications for the origin of WNL stars”, *Monthly Notices of the Royal Astronomical Society*, 494, 3861.
169. **Krumholz, M. R.**, & McKee, C. F. 2020, “How do bound star clusters form?”, *Monthly Notices of the Royal Astronomical Society*, 494, 624.
168. Armillotta, L.* , **Krumholz, M. R.**, & Di Teodoro, E. M. 2020, “The life cycle of the Central Molecular Zone. II: Distribution of atomic and molecular gas tracers”, *Monthly Notices of the Royal Astronomical Society*, 493, 5273.
167. **Krumholz, M. R.**, Crocker, R. M., Xu, S., Lazarian, A., Rosevear, M. T.* , & Bedwell-Wilson, J.* 2020, “Cosmic ray transport in starburst galaxies”, *Monthly Notices of the Royal Astronomical Society*, 493, 2817.

166. Gentry, E. S.*, Madau, P., & **Krumholz, M. R.** 2020, “Momentum injection by clustered supernovae: testing sub-grid feedback prescriptions”, *Monthly Notices of the Royal Astronomical Society*, 492, 1243.

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165. Armillotta, L.*, **Krumholz, M. R.**, Di Teodoro, E. M., & McClure-Griffiths, N. M. 2019, “The life cycle of the Central Molecular Zone. I: Inflow, star formation, and winds”, *Monthly Notices of the Royal Astronomical Society*, 490, 4401.

164. Pleintinger, M. M. M., Siegert, T., Diehl, R., Fujimoto, Y.*, Greiner, J., Krause, M. G. H., & **Krumholz, M. R.** 2019, “Comparing simulated ^{26}Al maps to gamma-ray measurements”, *Astronomy & Astrophysics*, 632, A73.

163. Sharda, P.*, **Krumholz, M. R.**, & Federrath, C. 2019, “The role of the H_2 adiabatic index in the formation of the first stars”, *Monthly Notices of the Royal Astronomical Society*, 490, 513.

162. Crundall, T. D.*, Ireland, M. J., **Krumholz, M. R.**, & Federrath, C. 2019, “CHRONOSTAR: a novel Bayesian method for kinematic age determination. I: Derivation and application to the β Pictoris Moving Group”, *Monthly Notices of the Royal Astronomical Society*, 489, 3625.

161. Dekel, A., Sarkar, K. C., Jiang, F., Bournaud, F., **Krumholz, M. R.**, Ceverino, D., & Primack, J. 2019, “The global star formation law by supernova feedback”, *Monthly Notices of the Royal Astronomical Society*, 488, 4753.

160. Khullar, S.*, **Krumholz, M. R.**, Federrath, C., & Cunningham, A. J. 2019, “Determining star formation thresholds from observations”, *Monthly Notices of the Royal Astronomical Society*, 488, 1407.

159. Forbes, J. C., **Krumholz, M. R.**, & Speagle, J. S. 2019, “Towards a radially-resolved semi-analytic model for the evolution of disc galaxies tuned with machine learning”, *Monthly Notices of the Royal Astronomical Society*, 487, 3581.

158. Fujimoto, Y.*, Haydon, D. T., Chevance, M., **Krumholz, M. R.**, & Kruijssen, J. M. D. 2019, “A fundamental test for stellar feedback recipes in galaxy simulations”, *Monthly Notices of the Royal Astronomical Society*, 487, 1717.

157. Cook, D. O., *et al.* 2019, “Star cluster catalogues for the LEGUS dwarf galaxies”, *Monthly Notices of the Royal Astronomical Society*, 484, 4897.

156. 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.

155. McCann, J. R., Murray-Clay, R. A., Kratter, K., & **Krumholz, M. R.** 2019, “Morphology of Hydrodynamic Winds: A Study of Planetary Winds in Stellar Environments”, *The Astrophysical Journal*, 873, 89.

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.

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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. Michalowski, 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.

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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.
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19. **Krumholz, M. R. & McKee, C. F.** 2008, “A Minimum Column Density of 1 g cm^{-2} for Massive Star Formation”, *Nature*, 451, 1082.
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.
14. **Krumholz, M. R., Klein, R. I., & McKee, C. F.** 2007, “Molecular Line Emission from Massive Protostellar Disks: Predictions for ALMA and the EVLA”, *Astrophysical Journal*, 665, 478.
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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

- | | |
|-----------------|---|
| 2024 (expected) | Matt Roth (jointly supervised with R. Crocker) |
| 2024 (expected) | Tabassum Tanvir (jointly supervised with C. Federrath) |
| 2024 (expected) | Zefeng Li (jointly supervised with E. Wisnioski and T. Mendel) |
| 2023 (expected) | Piyush Sharda (jointly supervised with C. Federrath, M. Asplund, E. da Cunha) |
| 2020 (expected) | Ayan Acharyya (jointly supervised with C. Federrath and L. Kewley) |
| 2019 | Eric Gentry (jointly supervised with P. Madau, A. Lethaud)
Thesis: <i>The Momentum Yield of Clustered SNe; Machine Learning to Identify Dwarf Galaxies</i> |
| 2017 | Anna Rosen (jointly supervised with E. Ramirez-Ruiz)
Thesis: <i>The Destructive Birth of Massive Stars and Massive Star Clusters</i> |
| 2016 | John Forbes
Thesis: <i>Numerical Experiments in Galactic Disks: Gravitational Instability, Stochastic Accretion, and Galactic Winds</i> |
| 2015 | Nathan Goldbaum
Thesis: <i>Star Formation in Gravitationally Unstable Disk Galaxies: from Clouds to Disks</i> |
| 2014 | Robert da Silva (jointly supervised with J. Xavier Prochaska)
Thesis: <i>Stochastically Lighting Up Galaxies: Statistical Implications of Stellar Clustering</i> |
| 2012 | Michele Fumagalli (jointly supervised with J. Xavier Prochaska)
Thesis: <i>Food for Stars: The Role of Hydrogen in the Formation and Evolution of Galaxies</i> |
| 2011 | Laura Lopez (jointly supervised with E. Ramirez-Ruiz and J. Xavier Prochaska)
Thesis: <i>The Tumultuous Lives and Deaths of Stars</i> |

Masters Students

- | | |
|-----------------|--|
| 2020 (expected) | Donghee Nam (jointly supervised with C. Federrath) |
| 2020 (expected) | Zipeng Hu |
| 2019 | Shivan Khullar (degree awarded by Birla Institute of Technology & Science, Pilani)
Thesis: <i>Star Formation Thresholds: Real and Illusory</i> |
| 2018 | Timothy Crundall (jointly supervised with M. Ireland)
Thesis: <i>Characterising the Kinematic Substructure of Young Stellar Associations: A Bayesian Analysis</i> |

Undergraduate and Honours Students

2020 (expected)	Jasper Bedwell-Wilson (jointly supervised with R. Crocker)
2019	Melanie Robertson (jointly supervised with R. Crocker) Thesis: <i>Gamma-Ray Constraints on the Cosmic Ray Ionisation Rate in Starburst Galaxies</i>
2014	Theodore Rendahl Thesis: <i>Stochasticity in Nebular Emission Lines</i>
2013	Jonathan Parra Thesis: <i>Detecting Variations of the High Mass End of the Stellar Initial Mass Function from Unresolved Star Clusters</i>
2012	Jonathan Craig Thesis: <i>Close Encounters in the Stellar Birth Cluster</i>
2011	Donald Dukes Thesis: <i>Nemesis</i>
2011	Lev Gendelev Thesis: <i>Evolution of Blister-Type H II Regions in a Magnetized Medium</i>

GRANTS AND FELLOWSHIPS

2020	Humboldt Research Award €60,000
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>Modelling 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>
2020 - 2022	Chair, Astronomy Australia Ltd., Astronomical Supercomputer Time Allocation Committee
2016 - 2019	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

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|-------------|---|
| 2009 - 2015 | Founder and Director
<i>UC Santa Cruz Project for Inmate Education</i>
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
<i>Princeton Prison Teaching Initiative</i>
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
<i>Prison University Project</i>
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. |