

MARK REUBEN KRUMHOLZ

CURRICULUM VITAE

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POSITIONS HELD

Starting Sep. 2008	University of California Santa Cruz, Astrophysics Department <i>Assistant Professor</i>	Santa Cruz, CA, USA
Sep. 2005 - Aug. 2008	Princeton University, Astrophysics Department <i>Hubble, Spitzer, and Council on Science and Technology Postdoctoral Fellow</i>	Princeton, NJ, USA

EDUCATION

Aug. 2005	University of California, Berkeley <i>Doctor of Philosophy, Physics</i>	Berkeley, CA, USA
May 2000	University of California, Berkeley <i>Master of Arts, Physics</i>	Berkeley, CA, USA
June 1998	Princeton University <i>Bachelor of Arts, Physics with Certificate in Applied and Computational Mathematics, summa cum laude</i>	Princeton, NJ, USA

AWARDS AND HONORS

2006	Offered membership in the Princeton University Society of Fellows (declined due to conflict with Hubble Fellowship policies)
2005	Hubble Postdoctoral Fellowship
2005	NSF Postdoctoral Fellowship (declined)
2005	Lyman Spitzer Postdoctoral Fellowship <i>Princeton University</i>
2005	Council on Science and Technology Postdoctoral Fellowship <i>Princeton University</i>
2005	Menzel Postdoctoral Fellowship (declined) <i>Harvard-Smithsonian CfA</i>
2005	Mary Elizabeth Uhl Dissertation Prize <i>University of California, Berkeley</i>
2001	NASA Graduate Student Researcher Program Fellowship
2000	Hertz Foundation Fellowship Finalist
1999	Outstanding Graduate Student Instructor Award <i>University of California, Berkeley</i>
1998	NSF Graduate Fellowship
1998	Kusaka Memorial Award <i>Princeton University</i>
1998	Elected to Φ BK and Σ E

PROFESSIONAL SERVICE

- 2005 - present Referee for *Nature*, *Astrophysical Journal*, *Astronomical Journal*, and *Monthly Notices of the Royal Astronomical Society*
- 2005 - 2007 Organizer of Princeton Astrophysics Department Interstellar Medium and Star Formation Seminar

TEACHING AND COMMUNITY SERVICE

- Dec. 2005 - present Founder, director, and instructor
Princeton Project Inside
- PPI is a volunteer program I founded through which Princeton University faculty, staff, and students teach classes at Garden State Youth Correctional Facility in Yardville, NJ.
 - PPI works in conjunction with a program run by Mercer County Community College, and the courses we teach are accredited through MCCC.
 - PPI offered college algebra in the spring 2006 and fall 2006 semesters, and plans to offer algebra and introduction to college writing in spring 2007.
 - I co-taught college algebra in spring and fall 2006.
- Sep. 1998 - Aug. 2005 Advisory board member, director of science instruction, instructor
Prison University Project
- PUP is a non-profit (501(c)(3)) organization that provides free, accredited community college education to inmates at San Quentin State Prison, in San Quentin, CA.
 - As a member of the advisory board (Aug. 2002 - Aug. 2005), I helped set policy for PUP.
 - As director of math and science instruction (June 2000 - Aug. 2005), I helped decide what courses would be taught, recruited instructors, and helped write syllabuses.
 - As an instructor (Sep. 1998 - Aug. 2004) I taught courses including college algebra, introduction to astronomy, introduction to physics, and topics in mathematics.
 - All jobs I performed with PUP were on a strictly volunteer basis.
 - For more on PUP, see <http://PrisonUniversityProject.org>.
- Aug. 1998 - May 1999 Graduate student instructor
UC Berkeley Physics Department
- Feb. 1996 - May 1996 Grader
Princeton University Mathematics Department

- Offner, S. S. R., **Krumholz, M. R.**, Klein, R. I., & McKee, C. F. 2008, “The Dynamics of Molecular Cloud Cores in Driven and Undriven Turbulence Environments”, *Astronomical Journal*, submitted, arXiv:0712:3053.
- Krumholz, M. R.** & McKee, C. F. 2008, “A Minimum Column Density of 1 g cm^{-2} for Massive Star Formation”, *Nature*, in press.
- Kratter, K. M., Matzner, C. D., & **Krumholz, M. R.** 2008, “Global Models for the Evolution of Embedded, Accreting Protostellar Disks”, *Astrophysical Journal*, in press, arXiv:0709.4252.
- Krumholz, M. R.**, Stone, J. M & Gardiner, T. A. 2007, “Magnetohydrodynamic Evolution of HII Regions: Simulation Methodology, Convergence Tests, and Uniform Media”, *Astrophysical Journal*, 671, 518.
- Krumholz, M. R.**, & Thompson, T. A. 2007, “The Relationship Between Molecular Gas Tracers and Kennicutt-Schmidt Laws”, *Astrophysical Journal*, 669, 289.
- 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.
- 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.
- Krumholz, M. R.** & Thompson, T. A. 2007, “Mass Transfer in Close, Rapidly Accreting Protobinaries: An Origin for Massive Twins?”, *Astrophysical Journal*, 661, 1034.
- Krumholz, M. R.**, Klein, R. I., & McKee, C. F. 2007, “Simulations of Collapse and Fragmentation in Massive Protostellar Cores”, *Astrophysical Journal*, 656, 959.
- Krumholz, M. R.**, & Tan, J. C. 2007, “Slow Star Formation in Dense Gas: Evidence and Implications”, *Astrophysical Journal*, 654, 304.
- 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.
- Tan, J. C., **Krumholz, M. R.**, & McKee, C. F. 2006, “Equilibrium Star Cluster Formation”, *Astrophysical Journal Letters*, 641, 121.
- Krumholz, M. R.** 2006, “Radiation Feedback and Fragmentation in Massive Protostellar Cores”, *Astrophysical Journal Letters*, 641, 45.
- Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2006, “Bondi-Hoyle Accretion in a Turbulent Medium”, *Astrophysical Journal*, 638, 369.
- Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2005, “The Formation of Stars by Gravitational Collapse Rather Than Competitive Accretion”, *Nature*, 438, 332.
- 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.
- Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2005, “How Protostellar Outflows Help Massive Stars Form”, *Astrophysical Journal Letters*, 618, 33.
- Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2005, “Bondi Accretion in the Presence of Vorticity”, *Astrophysical Journal*, 618, 757.
- Krumholz, M. R.**, McKee, C. F., & Klein, R. I. 2004, “Embedding Lagrangian Sink Particles in Eulerian Grids”, *Astrophysical Journal*, 611, 399.

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 AND REVIEW CONFERENCE PROCEEDINGS

Krumholz, M. R. 2007, “Collapse, Fragmentation, and Accretion in Massive Cores”, in “Massive Star Formation: Observations Confront Theory”, eds. H. Beuther *et al.*, in press.

Krumholz., M. R. & Bonnell, I. A., 2007, “Models for the Formation of Massive Stars”, in “Structure Formation in the Universe”, in “Structure Formation in the Universe”, ed. G. Chabrier, in press, arXiv:0712.0828.

Krumholz, M. R. 2007, “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, in press, arXiv:0706.3702.

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”, in press, astro-ph/0607429.

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, (San Francisco: ASP), 352, 31.

CONTRIBUTED CONFERENCE PROCEEDINGS

Kratter, K. M., Matzner, C. D., & **Krumholz, M. R.** 2007, “Embedded, Accreting Disks in Massive Star Formation”, in “Massive Star Formation: Observations Confront Theory”, eds. H. Beuther *et al.*, in press, arXiv:0712.0853.

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, (Cambridge: Cambridge University Press), 237, 378.

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, (Cambridge: Cambridge University Press), 227, 231.

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, (San Francisco: ASP), 323, 401.

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.

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.

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, (San Francisco: ASP), 23.

PUBLICATIONS IN THE POPULAR PRESS

Krumholz, M. R. Review of *Parallax*, by Alan Hirshfeld, *San Francisco Bay Guardian*, Sep. 1, 2001.

Krumholz, M. R. Review of *The Neptune File*, by Tom Standage, *San Francisco Bay Guardian*, Apr. 1, 2001.

Krumholz, M. R. “Astronomy and its Discontents” (feature article), *San Francisco Bay Guardian*, Mar. 7, 2001.