Michael K. McCourt

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EDUCATION AND ACADEMIC POSITIONS

UC Santa Barbara	*2016–2018*	KITP and Hubble Fellow
	2015–2016	Postdoc
Harvard	*2014–2015*	ITC Fellow
UC Berkeley	*2008–2014*	Graduate Student

- *2014: Ph.D. astrophysics*
- *2010: M.A. astrophysics*
- *advisor: Eliot Quataert*

Stanford University	*2005–2008*	Undergraduate Student

- *2008: B.S. physics*
- *concentration in theoretical physics*
- *advisor: Roger Blandford*

ACADEMIC AWARDS

UC Berkeley	*April 2014*	Mary Elizabeth Uhl Prize
	May 2012	Robert J. Trumpler Graduate Student Excellence Award
Stanford University	*Fall 2007*	Nomination for the Churchill Scholarship
	Summer 2006	VPUE Grant for Undergraduate Research
Rose Hills Foundation	*Summer 2007*	Rose Hills Award for Undergraduate Research

PROFESSIONAL SERVICE

- Co-instituted and co-organized a new lunch talk series at UCSB

- Organizer ("Mentor Master") for the UC Berkeley Astronomy Department peer-mentoring system.

- Referee for the *Astrophysical Journal* (and *ApJ Letters*), *MNRAS* (and *MNRAS Letters*), *Astrophysics and Space Science*, *Journal of Fluid Mechanics*, and *Nature Letters*.

- Author of several open-source emacs packages, including a popular major mode for editing gnuplot scripts and a browser for fetching BibTeX entries from ADS. Both are available in the MELPA package repository

FUNDING PROPOSALS

	grant	award ($k)	year
5	HST THEORY GRANT	120	2018
4*	ATP THEORY GRANT	642	2017
3	ATP THEORY GRANT	410	2017
2	HUBBLE FELLOWSHIP	350	2015
1	CHANDRA THEORY GRANT	60	2011
	total:	1582	

* denotes proposals where I was a Co-I

COMPUTING GRANTS

	agency	award ($\times 10^6$ hour)	value ($k)	year
8	NSF	5.6	23	2017
7	NSF	1.6	55	2016
6	NSF	1.2	40	2016
5	NSF	0.6	20	2015
4	NSF	3.2	110	2015
3	NASA	4.7	100	2015
2	NSF	2.6	89	2014
1	NASA	2.4	75	2014
	total:	21.9	512	

most of these proposals are collaborative; this list includes only grants where I was a primary author

OBSERVING PROPOSALS

	facility	award (hours)	year
4	VLA	6.0	2017
3	GEMINI	1.0	2016
2	VLA	4.0	2015
1	VLA	6.0	2014

TEACHING EXPERIENCE

UC Santa Barbara

2017 — Organized and taught a fluid dynamics "bootcamp" for graduate students

2016–present — Supervising undergraduate research
· *will soon result in two student-led publications*

UC Berkeley

2008–2009 — Graduate Student Instructor

Stanford University

2008 — Undergraduate Instructor
· *co-designed and taught a course on numerical methods (Physics 90SI) under the student-initiated course program.*

25. Madigan, Zderic, er, McCourt, et al., *AJ* (2018)
"On the Dynamics of the Inclination Instability"

24. Ji, Oh, & McCourt, *MNRAS* (2018)
"The impact of magnetic fields on thermal instability"

23. Madigan, Halle, rew, Moody, et al., *ApJ* (2018)
"Dynamical Properties of Eccentric Nuclear Disks: Stability, Longevity, and Implications for Tidal Disruption Rates in Post-merger Galaxies"

22. McCourt, Oh, O'Leary, & Madigan, *MNRAS* (2018)
"A characteristic scale for cold gas"

21. Gronke, Dijkstra, McCourt, & Oh, *A&A* (2017)
"Resonant line transfer in a fog: using Lyman-alpha to probe tiny structures in atomic gas"

20. Fielding, Quataert, McCourt, & Thompson, *MNRAS* (2017)
"The impact of star formation feedback on the circumgalactic medium"

19. Madigan, McCourt, & O'Leary, *MNRAS* (2017)
"Using gas clouds to probe the accretion flow around Sgr A: G2's delayed pericentre passage"*

18. Guillochon & McCourt, *ApJ* (2017)
"Simulations of Magnetic Fields in Tidally Disrupted Stars"

17. Gronke, Dijkstra, McCourt, & Oh, *ApJ* (2016)
"From Mirrors to Windows: Lyman-alpha Radiative Transfer in a Very Clumpy Medium"

16. Guillochon, McCourt, Chen, Johnson, et al., *ApJ* (2016)
"Unbound Debris Streams and Remnants Resulting from the Tidal Disruptions of Stars by Supermassive Black Holes"

15. Madigan & McCourt, *MNRAS* (2016)
"A new inclination instability reshapes Keplerian discs into cones: application to the outer Solar system"

14. Lecoanet, McCourt, Quataert, Burns, et al., *MNRAS* (2016)
"A validated non-linear Kelvin-Helmholtz benchmark for numerical hydrodynamics"

13. McCourt & Madigan, *MNRAS* (2016)
"Going with the flow: using gas clouds to probe the accretion flow feeding Sgr A"*

12. McCourt, O'Leary, Madigan, & Quataert, *MNRAS* (2015)
"Magnetized gas clouds can survive acceleration by a hot wind"

11. McBride & McCourt, *MNRAS* (2014)
"Bent radio jets reveal a stripped interstellar medium in NGC 1272"

10. Wagh, Sharma, & McCourt, *MNRAS* (2014)
"Thermal conduction and multiphase gas in cluster cores"

9. McCourt, Quataert, & Parrish, *MNRAS* (2013)
"What sets temperature gradients in galaxy clusters? Implications for non-thermal pressure support and mass-observable scaling relations"

8. Sharma, McCourt, Parrish, & Quataert, *MNRAS* (2012)
"On the structure of hot gas in haloes: implications for the L_X-T_X relation and missing baryons"

7. Parrish, McCourt, Quataert, & Sharma, *MNRAS* (2012)
   "The effects of anisotropic viscosity on turbulence and heat transport in the intracluster medium"

6. Sharma, McCourt, Quataert, & Parrish, *MNRAS* (2012)
   "Thermal instability and the feedback regulation of hot haloes in clusters, groups and galaxies"

5. McCourt, Sharma, Quataert, & Parrish, *MNRAS* (2012)
   "Thermal instability in gravitationally stratified plasmas: implications for multiphase structure in clusters and galaxy haloes"

4. Parrish, McCourt, Quataert, & Sharma, *MNRAS* (2012)
   "Turbulent pressure support in the outer parts of galaxy clusters"

3. McCourt, Parrish, Sharma, & Quataert, *MNRAS* (2011)
   "Can conduction induce convection? On the non-linear saturation of buoyancy instabilities in dilute plasmas"

2. Bradač, Schrabback, Erben, McCourt, et al., *ApJ* (2008)
   "Dark Matter and Baryons in the X-Ray Luminous Merging Galaxy Cluster RX J1347.5-1145"

1. Samulon, Islam, Sebastian, Brooks, et al., *Phys. Rev. B* (2006)
   "Low-temperature structural phase transition and incommensurate lattice modulation in the spin-gap compound $BaCuSi_2O_6$"

SELECTED PRESENTATIONS

29.	*Invited Talk*, What matter(s) around galaxies	June 2017
28.	*Lunch Talk*, UC Santa Barbara	March 2017
27.	*Contributed Talk*, Hubble Fellow Symposium	March 2017
26.	*Astronomy Colloquium*, University of Washington	February 2017
25.	*MPS Seminar*, UC Santa Cruz	October 2016
24.	*Invited Talk*, Fellows at the Frontier Conference	September 2016
23.	*Invited Talk*, Theory & Computation in the ICM	August 2016
22.	*Seminar*, Cold Universe Workshop	June 2016
21.	*Astronomy Seminar*, UCSB	April 2016
20.	*Lunch Talk*, Harvard ITC	April 2015
19.	*Pizza Lunch*, Harvard ITC	April 2015
18.	*Lunch Talk*, UCSB	April 2015
17.	*Lunch Talk*, UC Berkeley	March 2015
16.	*Contributed Talk*, Black Holes in Dense Star Clusters	January 2015
15.	*Cosmology Seminar*, Yale	September 2014
14.	*CIERA Astrophysics Seminar*, Northwestern	September 2014
13.	*Lunch Talk*, UC Berkeley	February 2014
12.	*TAPIR Seminar*, Caltech	October 2013
11.	*KIPAC "Tea-Talk" Seminar*, Stanford	October 2013
10.	*ITC Seminar*, Harvard CfA	September 2013
9.	*Geo- and Astro-physical Fluid Dynamics Seminar*, UCSC	April 2013

8. *Invited Talk*, SnowCluster conference   March 2013

7. *Astrophysics Seminar*, UCSB   October 2012

6. *Theory Seminar*, CITA   October 2012

5. *Informal Astrophysics Seminar*, Princeton IAS   October 2012

4. *Invited Talk*, Theory & Computation in the ICM   August 2012

3. *KITP Theory Lunch talk*, UCSB   April 2011

2. *Contributed Talk*, Theory & Computation in the ICM   August 2010

1. *KIPAC "Tea-Talk" Seminar*, Stanford   August 2006

PATENTS

9. McCourt, *Patent Number: US 12,230,253 B2, Awarded: Feb 18, 2025*
   "Automatic classification of phone calls using representation learning based on the hierarchical pitman-yor process"

8. McCourt, Ghodoussi & Borda, *Pending Patent Application, Patent Number: US 2024/0312451 A1, Filed: Mar 17, 2023*
   "Topic-based semantic search of electronic documents based on machine learning models from bayesian belief networks"

7. McCourt & Borda, *Patent Number: US 11,429,901 B1, Awarded: Aug 30, 2022*
   "Pitman-Yor process topic modeling pre-seeded by keyword groupings"

6. McCourt & Praturu, *Patent Number: US 11,804,216 B2, Awarded: Oct 31, 2023*
   "Generating training datasets for a supervised learning topic model from outputs of a discovery topic model"

5. McCourt & Lawrence, *Patent Number: US 11,521,601 B2, Awarded: Dec 6, 2022*
   "Detecting extraneous topic information using artificial intelligence models"

4. McCourt, Storlie, Borda, Lawrence, et al., *Patent Number: US 11,115,520 B2, Awarded: Sep 7, 2021*
   "Signal discovery using artificial intelligence models"

3. McCourt, *Patent Number: US 10,719,783 B2, Awarded: Jul 21, 2020*
   "Binary signal classifiers that tolerate incorrect training data"

2. McCourt, *Patent Number: US 11,423,330 B2, Awarded: Aug 23, 2022*
   "Performance score determiner for binary signal classifiers"

1. Storlie, Borda, McCourt, Kirchhoff, et al., *Patent Number: US 10,332,546 B1, Awarded: Jun 25 2019*
   "Desired signal spotting in noisy, flawed environments"

USELESS AND UNUSUAL SKILLS

· *building wooden boats and furniture*
· *restoring old railroad lanterns (hot- and cold-blast)*
· *restoring vintage cameras and fountain pens*
· *converting cinema film for use in still cameras*

· *designing and building lightweight camping gear*
· *onetime holder of a federal pyrotechnics permit*