

MICHAEL K. MCCOURT

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EDUCATION AND ACADEMIC POSITIONS

UC Santa Barbara	2016–2018	KITP and Hubble (NASA) Fellow <ul style="list-style-type: none">· <i>Awarded prestigious fellowships to lead independent astrophysics research.</i>· <i>Authored 25 peer-reviewed papers (2,161 citations as of Apr 2025) on diverse topics including fluid dynamics, cosmology, galaxy formation, and solar system dynamics.</i>· <i>Raised over \$2M in funding and computing resources; hired and mentored junior researchers including postdocs and students.</i>· <i>Designed and taught a fluid dynamics bootcamp at UCSB based on community need.</i>
	2015–2016	Postdoctoral Researcher
Harvard	2014–2015	ITC Fellow <ul style="list-style-type: none">· <i>Awarded prestigious fellowship to lead independent astrophysics research.</i>
	2008–2014	Graduate Student <ul style="list-style-type: none">· 2014: <i>Ph.D. astrophysics</i>· 2010: <i>M.A. astrophysics</i>· <i>advisor: Eliot Quataert</i>
Stanford University	2005–2008	Undergraduate Student <ul style="list-style-type: none">· 2008: <i>B.S. physics</i>· <i>concentration in theoretical physics</i>· <i>advisor: Roger Blandford</i>

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

INDUSTRY EXPERIENCE

Sturdy Statistics	2025–present	<p>Co-Founder & CEO</p> <ul style="list-style-type: none"> · Co-founded Sturdy Statistics to help organizations make sense of unstructured data using accessible, high-quality statistical tools. · Helped design and implement our core technology, and developed key intellectual property. · Guided the company through its initial growth as we built a foundation for long-term impact.
Self-Employed	2024–2025	Statistics & Data Science Consultant
Invoca	2022–2024	<p>Senior Principal Data Scientist</p> <ul style="list-style-type: none"> · Re-architected Invoca's machine learning codebase to enhance scalability and flexibility for both production and research use cases. · Mentored interns and junior scientists, supporting their career development while maintaining rapid R&D progress. · Media Interview: "Real-time conversational insights from phone call data with Mike McCourt from Invoca." (Practical AI #77)
	2020–2022	<p>Principal Data Scientist</p> <ul style="list-style-type: none"> · Spearheaded customer-first R&D initiatives by identifying pain points and developing a novel natural language classifier tailored to client needs. Delivered production-ready code and submitted a supporting patent application. · Collaborated across product and data science leadership to plan and execute the migration of customers from the DialogTech platform following acquisition. · Primary inventor on three AI-focused patents: <ul style="list-style-type: none"> – US 12,230,253 - Automatic classification of phone calls – US 11,429,901 - Incorporating domain knowledge into AI models – US 2024/0312451 (pending) - Topic-based semantic search
	2019–2020	<p>Staff Data Scientist</p> <ul style="list-style-type: none"> · Received the President's Club award for exceptional contributions to the company. · Invented a Bayesian deep learning framework for natural language processing using the hierarchical Pitman-Yor process. (Featured in press, blog, and industry coverage) · Mentored three interns on impactful R&D projects, with one joining the team full-time before starting a Ph.D. · Primary inventor on three AI-focused patents: <ul style="list-style-type: none"> – US 11,115,520 – Signal Discovery using AI Models – US 11,521,601 – Detecting Extraneous Topic Information – US 11,804,216 – Generating Training Datasets Using Discovery Models
	2018–2019	<p>Data Scientist</p> <ul style="list-style-type: none"> · Re-implemented a major third-party ML service in-house, reducing costs and enabling tighter integration with Invoca's platform. · Partnered with product, sales, and customer success teams to uncover customer pain points and rapidly prototype solutions. · Mentored an intern who later joined the team full-time. · Sole inventor on two granted/pending patents: <ul style="list-style-type: none"> – US 10,719,783 – Binary Signal Classifiers – US 11,423,330 – Performance Score Determiner

PATENTS

9. McCourt, [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, [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, [US 11,429,901 B1](#) (Awarded: Aug 30, 2022)
“Pitman-Yor process topic modeling pre-seeded by keyword groupings”
6. McCourt & Praturu, [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, [US 11,521,601 B2](#) (Awarded: Dec 6, 2022)
“Detecting extraneous topic information using artificial intelligence models”
4. McCourt, Storlie, Borda, Lawrence, et al., [US 11,115,520 B2](#) (Awarded: Sep 7, 2021)
“Signal discovery using artificial intelligence models”
3. McCourt, [US 10,719,783 B2](#) (Awarded: Jul 21, 2020)
“Binary signal classifiers that tolerate incorrect training data”
2. McCourt, [US 11,423,330 B2](#) (Awarded: Aug 23, 2022)
“Performance score determiner for binary signal classifiers”
1. Storlie, Borda, McCourt, Kirchhoff, et al., [US 10,332,546 B1](#) (Awarded: Jun 25, 2019)
“Desired signal spotting in noisy, flawed environments”

ACADEMIC 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
	<i>total:</i>	1,582	

* denotes proposals
where I was a Co-I
but not the primary
author

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
	<i>total:</i>	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 · <i>will soon result in two student-led publications</i>
UC Berkeley	2008–2009	Graduate Student Instructor
Stanford University	2008	Undergraduate Instructor · <i>co-designed and taught a course on numerical methods (Physics 90SI) under the student-initiated course program.</i>

PUBLICATIONS

25. Madigan, Zderic, et al., 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, et al., 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 $\text{BaCuSi}_2\text{O}_6$ ”

SELECTED PRESENTATIONS

29. <i>Invited Talk</i> , What matter(s) around galaxies	June 2017
28. <i>Lunch Talk</i> , UC Santa Barbara	March 2017
27. <i>Contributed Talk</i> , Hubble Fellow Symposium	March 2017
26. <i>Astronomy Colloquium</i> , University of Washington	February 2017
25. <i>MPS Seminar</i> , UC Santa Cruz	October 2016
24. <i>Invited Talk</i> , Fellows at the Frontier Conference	September 2016
23. <i>Invited Talk</i> , Theory & Computation in the ICM	August 2016
22. <i>Seminar</i> , Cold Universe Workshop	June 2016
21. <i>Astronomy Seminar</i> , UCSB	April 2016
20. <i>Lunch Talk</i> , Harvard ITC	April 2015
19. <i>Pizza Lunch</i> , Harvard ITC	April 2015
18. <i>Lunch Talk</i> , UCSB	April 2015
17. <i>Lunch Talk</i> , UC Berkeley	March 2015
16. <i>Contributed Talk</i> , Black Holes in Dense Star Clusters	January 2015
15. <i>Cosmology Seminar</i> , Yale	September 2014
14. <i>CIERA Astrophysics Seminar</i> , Northwestern	September 2014
13. <i>Lunch Talk</i> , UC Berkeley	February 2014
12. <i>TAPIR Seminar</i> , Caltech	October 2013
11. <i>KIPAC "Tea-Talk" Seminar</i> , Stanford	October 2013
10. <i>ITC Seminar</i> , Harvard CfA	September 2013
9. <i>Geo- and Astro-physical Fluid Dynamics Seminar</i> , UCSC	April 2013
8. <i>Invited Talk</i> , SnowCluster conference	March 2013
7. <i>Astrophysics Seminar</i> , UCSB	October 2012
6. <i>Theory Seminar</i> , CITA	October 2012
5. <i>Informal Astrophysics Seminar</i> , Princeton IAS	October 2012
4. <i>Invited Talk</i> , Theory & Computation in the ICM	August 2012
3. <i>KITP Theory Lunch talk</i> , UCSB	April 2011
2. <i>Contributed Talk</i> , Theory & Computation in the ICM	August 2010
1. <i>KIPAC "Tea-Talk" Seminar</i> , Stanford	August 2006

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*