

## Adam S. Jermyn

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### Education

PhD, Astronomy, University of Cambridge, Churchill College, Institute of Astronomy	2015-18
Dissertation: <a href="#">Turbulence and Transport in Stars and Planets</a>	
Supervisors: Christopher Tout and Gordon Ogilvie	
BS, Physics, California Institute of Technology	2011-15
Senior Thesis: <a href="#">The Atmospheric Dynamics of Pulsar Companions</a>	
Thesis Advisor: Sterl Phinney	
Academic Advisors: Tom Tombrello and Jason Alicea	

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### Research

Independent Researcher	Current
Flatiron Research Fellow, Center for Computational Astrophysics	2019-2022
KITP Postdoctoral Scholar, UCSB	2018-2019

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### Grants

OpenPhilanthropy Grant to study AI Interpretability	2023
Co-I on SOAR Proposal “Evolutionary history of the enigmatic Blue Large Amplitude Pulsators”	2022
KITP Program “Probes of Transport in Stars”	2021
Harvard Junior Society of Fellows (declined to accept KITP & Flatiron)	2018
Marshall Scholarship	2015-2018
US Department of Energy NERSC Allocation m1824 (PI, 230,000 core-hours)	2013-2018
Hertz Fellowship	2015
NSF Graduate Fellowship	2015
NDSEG Graduate Fellowship (declined to accept NSF)	2015
Barry M. Goldwater Fellowship	2014
Flintridge Foundation Summer Undergraduate Research Fellowship	2014
Jean J. Dixon Summer Undergraduate Research Fellowship	2013
Ph11 Summer Research Fellowship	2012

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### Awards

Alignment Research Center Eliciting Latent Knowledge Prize	2022
Won with Nicholas Schiefer for an algorithm to elicit latent knowledge by compressing the state of an ML system.	
IAU PhD Prize in the Division of Stars and Stellar Physics	2018
Institute of Astronomy Paul Murdin Prize (for best paper by a PhD student)	2017
Awarded for the best paper by a PhD student at the Institute of Astronomy. “Jermyns paper develops a new mechanism for the problem of swollen, hot Jupiter planets. The paper is particularly noteworthy for its development of analytic theory combining radiative insolation, tidal heating, and vibrational modes.”	
APS LeRoy Apker Award	2015
For original contributions to understanding how the atmospheres of pulsar companions are heated and for elucidating the observational consequences.	
Caltech George W. Housner Award for Original Research	2015
Awarded to a senior selected for an outstanding piece of original scientific research.	
Caltech Frederic W. Hinrichs, Jr. Memorial Leadership Award	2015
Awarded to the seniors who, in the opinion of the undergraduate deans, have made the greatest undergraduate contribution to the welfare of the student body and whose qualities of leadership,	

character, and responsibility have been outstanding.	
Caltech Dr. D. S. Kothari Prize	2015
Awarded to a graduating senior in physics who has produced an outstanding research project during the year.	
Caltech Library Senior Thesis Prize	2015
For the thesis titled The Atmospheric Dynamics of Pulsar Companions., described by the prize committee as a tour de force in its breadth of scholarship, creativity and significance.	
Caltech Haren Lee Fisher Memorial Award in Physics	2014
Awarded to a junior physics major who demonstrates the greatest promise of future contributions in physics.	
Caltech Jack E. Froehlich Memorial Award	2014
Awarded to a junior in the upper 5 percent of his or her class who shows outstanding promise for a creative professional career.	
Caltech Perpall Scientific Speaking Competition 2nd Place	2014
Awarded after a three-round competition of presentations following a Summer Undergraduate Research Fellowship.	
US Physics Team (top 20 in US on semifinal exam)	2011
First Place Massachusetts State Science Fair	2010

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## Mentoring

### Graduate Students

<i>Eoin Farrell</i> : Projects on subsurface convection and magnetism in early-type stars (1 paper).	2021-2022
<i>Alexander Dittmann</i> : Projects on stellar evolution in AGN disks (3 papers).	2020-2022
<i>George Varnavides</i> : Projects on electron & phonon transport, hydrodynamics (2 papers).	2017-2022
<i>Evan Anders</i> : Projects on convective boundaries in massive stars (1 paper).	2019-2020

### Undergraduate Students

<i>Aidan Simpson</i> : Summer research project on stellar evolution in AGN disks.	2020
<i>Jackie Lodman</i> : Research project on star formation and cosmic rays (1 paper).	2018

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## Software

Spartans - Quantum carrier transport code	2020-2022
Skye - A Differentiable Equation of State for ionized matter	2020-2022
Modules for Experiments in Stellar Astrophysics (MESA) - Developer	2018-2022
PyTNR - Python module for contracting unstructured tensor networks	2017-2021
NESSE - Quantum carrier transport code	2012-2021
AstroStatsSuite - Statistical tools for non-parametric regression in astronomy	2017
TensorDecomp - Python module for computing tree decompositions of tensors	2017
arrfunc - Python module for treating functions as lazily-evaluated arrays	2017
QuantumChains - Numerical Spin Chain Calculation Package (GPLv3, github)	2013-2014
NanoImage - Atomic Force Microscopy Analysis (USPTO 13/534428)	2010-2011

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## Patents

<b>Jermyn, A. S.</b> , Silverman, J, Markovic, N, "System for Lightweight Image Processing", US Patent Number US 9,097,739 B2 (Filed 2011, Awarded 2015).	
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## Refereed Publications

### First or Second Author

1. **Jermyn, A. S.**, Stevenson, D. J. Levitin, D. J.  $1/f$  laws in non-human music. Scientific Reports (2023).

2. **Jermyn, A. S.**, Bauer, E. B., Schwab, J., Farmer, R., Ball, W. H., Bellinger, E. P., Dotter, A., Joyce, M., Marchant, P., Mombarg, J. S. G., Wolf, W. M., Wong, T. L. S., Cinquegrana, G. C., Farrell, E., Smolec, R., Thoul, A., Cantiello, M., Herwig, F., Toloza, O., Bildsten, L., Townsend, R. H. D., Timmes, F. X. Modules for Experiments in Stellar Astrophysics (MESA): Time-Dependent Convection, Energy Conservation, Automatic Differentiation, and Infrastructure. *The Astrophysical Journal Supplement* (2022, [arXiv](#)).
3. Dittmann, A. J., **Jermyn, A. S.**, Cantiello, M. The Influence of Disk Composition on the Evolution of Stars in the Disks of Active Galactic Nuclei. *The Astrophysical Journal* (2022).
4. Izzard, R. G., **Jermyn, A. S.**. Circumbinary discs for stellar population models. (2022, *MNRAS*).
5. Margalit, B., **Jermyn, A. S.**, Metzger, B. D., Roberts, L. F., Quataert, E. Angular Momentum Transport in Proto-Neutron Stars and the Fate of Neutron Star Merger Remnants. *The Astrophysical Journal* (2022, [arXiv](#)).
6. Farrell, E., **Jermyn, A. S.**, Cantiello, M., Foreman-Mackey, D. The Initial Magnetic Field Distribution in AB Stars. *The Astrophysical Journal* (2022, [Nasa ADS](#)).
7. **Jermyn, A. S.**, Anders, E. H., Lecoanet, D., Cantiello, M. An Atlas of Convection in Main-Sequence Stars. *The Astrophysical Journal Supplement* (2022, [arXiv](#)).
8. **Jermyn, A. S.**, Anders, E. H., Lecoanet, D., Cantiello, M. Convective Penetration in Early-Type Stars. *The Astrophysical Journal* (2022, [arXiv](#)).
9. **Jermyn, A. S.**, Dittmann, A. J., McKernan, B., Ford, K. E. S., Cantiello, M. Effects of an Immortal Stellar Population in AGN Disks. *The Astrophysical Journal* (2022, [arXiv](#), [AASNova Highlight](#)).
10. Anders, E. H., **Jermyn, A. S.**, Lecoanet, D., Fraser, A. E., Cresswell, I. G., Joyce, M., Fuentes, J. R. Schwarzschild and Ledoux are equivalent on evolutionary timescales. *The Astrophysical Journal Letters* (2022, [arXiv](#)).
11. **Jermyn, A. S.**, Anders, E. H., Cantiello, M. A Transparent Window into Early-Type Stellar Variability. *The Astrophysical Journal* (2022, [arXiv](#)).
12. **Jermyn, A. S.**, Cantiello, M. Magnetic Archaeology of Early-Type Stellar Dynamos. *The Astrophysical Journal* (2021, [arXiv](#)).
13. Anders, E. H., **Jermyn, A. S.**, Lecoanet, D., Brown, B. P. Stellar convective penetration: parameterized theory and dynamical simulations. *The Astrophysical Journal* (2021, [arXiv](#)).
14. **Jermyn, A. S.**, Dittmann, A. J., Cantiello, M., Perna, R. Stellar Evolution in the Disks of Active Galactic Nuclei Produces Rapidly Rotating Massive Stars. *The Astrophysical Journal* (2021, [arXiv](#)).
15. **Jermyn, A. S.**, Schwab, J., Timmes, F. X., Bauer, E. Potekhina, A. Y. Skye: A Differentiable Equation of State. *The Astrophysical Journal* (2021, [arXiv](#)).
16. Cantiello, M. **Jermyn, A. S.**, Lin, D. N. C. Stellar Evolution in AGN Disks. *The Astrophysical Journal* (2021, [arXiv](#)). **Featured in AAS NOVA.**
17. Gandhi, S. N., **Jermyn, A. S.** Coupled Day-Night Models of Exoplanetary Atmospheres. *Monthly Notices of the Royal Astronomical Society* (2020, [arXiv](#)).
18. **Jermyn, A. S.**, Chitre, Shashikumar, M., Lesaffre, P., Tout, A. C. Convective Differential Rotation in Stars and Planets II: Observational and Numerical Tests. *Monthly Notices of the Royal Astronomical Society* (2020, [arXiv](#)).
19. **Jermyn, A. S.**, Chitre, Shashikumar, M., Lesaffre, P., Tout, A. C. Convective Differential Rotation in Stars and Planets I: Theory. *Monthly Notices of the Royal Astronomical Society* (2020, [arXiv](#)).
20. Varnavides, G., **Jermyn, A. S.**, Anikeeva, P., Felser, C., Narang, P. Generalized Electron Hydrodynamics, Vorticity Coupling, and Hall Viscosity in Crystals. *Nature Communications* (2020, [arXiv](#)).
21. **Jermyn, A. S.**, Cantiello, M. The Origin of the Bimodal Distribution of Magnetic Fields in Early-type Stars. *The Astrophysical Journal* (2020, [arXiv](#)).
22. Shindler, F., **Jermyn, A. S.** Algorithms for Tensor Network Contraction Ordering. *Machine Learning: Science and Technology* (2020, [arXiv](#)).
23. **Jermyn, A. S.**, Cao, W., Elam, W. A., De La Cruz, E. M., Lin, M. M. Directional allosteric regulation of protein filament length. *Physical Review E* (2020).
24. **Jermyn, A. S.** Automatic Contraction of Unstructured Tensor Networks. *SciPost Physics* (2020, ).

25. Steinhardt, C. L., **Jermyn, A. S.**, Lodman, J. Thermal Regulation and the Star-Forming Main Sequence. *The Astrophysical Journal* (2019, [arXiv](#)).
26. **Jermyn, A. S.**, Tayar, J., Fuller, J. Differential Rotation in Convective Envelopes: Constraints from Eclipsing Binaries. *Monthly Notices of the Royal Astronomical Society* (2019, [arXiv](#)).
27. Varnavides, G., **Jermyn, A. S.**, Anikeeva, P., Narang, P. Non-Equilibrium Phonon Transport Across Nanoscale Interfaces. *Physical Review B* (2019, [arXiv](#)).
28. **Jermyn, A. S.**, Tagliabue, G., Atwater, H., Goddard, W., Sundararaman, R., Narang, P. Far-from-equilibrium transport of excited carriers in nanostructures. *Physical Review Materials* (2019, [arXiv](#)).
29. **Jermyn, A. S.** Efficient Decomposition of High-Rank Tensors. *Journal of Computational Physics* (2019, [arXiv](#)).
30. **Jermyn, A. S.**, Steinhardt, C. L., Tout, C. A. The Cosmic Microwave Background and the Stellar Initial Mass Function. *Monthly Notices of the Royal Astronomical Society* (2018, [arXiv](#)).
31. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M. Enhanced Mixing in Massive Rotating Stars. *Monthly Notices of the Royal Astronomical Society* (2018, [arXiv](#)).
32. Rasmussen, A\*, **Jermyn, A. S.\*** Gapless Topological Order, Gravity, and Black Holes. *Physical Review B* (2018, [arXiv](#)).
33. **Jermyn, A. S.**, Kama, M. Stellar Photospheric Abundances as a Probe of Disks and Planets. *Monthly Notices of the Royal Astronomical Society* (2018, [arXiv](#)).
34. **Jermyn, A. S.**, Lesaffre, P., Tout, C. A., Chitre, S. M. Turbulence Closure for Mixing Length Theories. *Monthly Notices of the Royal Astronomical Society* (2018 476 (1): 646-662, [arXiv:1803.00579](#)). **Invited listing in the newsletter of the IAU Working Group on Red Giants and Supergiants.**
35. Steinhardt, L., C., **Jermyn, A. S.** Nonparametric Methods in Astronomy: Think, Regress, Observe – Pick Any Three. *Proceedings of the Astronomical Society of the Pacific* (2017, [arXiv](#)).
36. Tagliabue, G., **Jermyn, A. S.**, Sundararaman, R., Welch, A. J., DuChene, J. S., Davoyan, A. R., Narang, P., Atwater, H. Quantifying the role of surface plasmon excitation and hot carrier transport in plasmonic devices. [Nature Communications](#) (2017).
37. **Jermyn, A. S.**, Tout, A. C., Ogilvie, I. G. Tidal heating and solar irradiation of Hot Jupiters. *Monthly Notices of the Royal Astronomical Society* (2017, [arXiv](#)).
38. Chatwin-Davies, A., **Jermyn, A. S.**, Carroll, S. How to Recover a Qubit That Has Fallen into a Black Hole. *Physical Review Letters* (2015, [arXiv](#)). **Highlighted in [Science Alert](#), [arsTechnica](#).**
39. **Jermyn, A. S.**, Mong, R., Alicea, J. Stability of zero-modes in parafermion chains. *Physical Review B* (2014, [arXiv](#)). **Editor’s Suggestion.**

#### Co-Author

1. Johnston, C., Michielsen, M., Anders, E. H., Renzo, M., Cantiello, M., Marchant, P., Goldberg, J. A., Townsend, R. H. D., Sabhahit, G., **Jermyn, A. S.** Modelling time-dependent convective penetration in 1D stellar evolution. (2023 [arXiv](#)).
2. Anders, E. H., Lecoanet, D., Cantiello, M., Burns, K. J., Hyatt, B. A., Kaufman, E., Townsend, R. H. D., Brown, B. P., Vasil, G. M., Oishi, J. S., **Jermyn, A. S.** The photometric variability of massive stars due to gravity waves excited by core convection. (2023 [arXiv](#), [Nature Astronomy](#)).
3. Kama, M., Folsom, C. P., **Jermyn, A. S.**, Teske, J. K. KELT-9 and its ultra-hot Jupiter: stellar parameters, composition, and pollution. (2022, [MNRAS](#), [arXiv](#)).
4. Steinhardt, C. L., Sneppen, A., Hensley, H., **Jermyn, A. S.**, Mostafa, B., Weaver, J., Brammer, G., Davidzon, I., Mobasher, B., Rusakov, V., Toft, S. Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence. (2022, [ApJ](#)).
5. McKernan, B., Ford, K. E. S., Cantiello, M., Graham, M. J., **Jermyn, A. S.**, Leigh, N. W. C., Ryu, T., Stern, D. Starfall: A heavy rain of stars in ‘turning on’ AGN. *MNRAS* (2022, [arXiv](#)).
6. Steinhardt, C. L., Sneppen, A., Mostafa, B., Hensley, H. **Jermyn, A. S.**, Lopez, A., Weaver, J., Brammer, G., Clark, T. H., Davidzon, I., Diaconu, A. C., Mobasher, B., Rusakov, V., Toft, S. Implications of a Temperature Dependent IMF II: An Updated View of the Star-Forming Main Sequence. 2021.
7. Sneppen, A., Steinhardt, C. L., Hensley, H., **Jermyn, A. S.**, Mostafa, B., Weaver, John. R. Implications of a Temperature Dependent IMF I: Photometric Template Fitting. *The Astrophysical Journal* (2022).

8. Cantiello, M., Lecoanet, D., **Jermyn, A. S.**, Grassitelli, L. On the Origin of Stochastic, Low-Frequency Photometric Variability in Massive Stars. *The Astrophysical Journal* (2021, [arXiv](#)).
9. Dittmann, A. J., Cantiello, M., **Jermyn, A. S.**. Accretion onto Stars in the Disks of Active Galactic Nuclei. *The Astrophysical Journal* (2021, [arXiv](#)).
10. Gilkis, A., Shenar, T., Ramachandran, V., **Jermyn, A. S.**, Mahy, L., Oskinova, L. M., Arcavi, I., Sana, H. The excess of cool supergiants from contemporary stellar evolution models defies the metallicity-independent Humphreys-Davidson limit. *Monthly Notices of the Royal Astronomical Society* (2021, [arXiv](#)).
11. Fielding, D., Ostriker, E. C., Bryan, G. L., **Jermyn, A. S.** Multiphase Gas and the Fractal Nature of Radiative Turbulent Mixing Layers. *The Astrophysical Journal Letters* (2020, [arXiv](#)).
12. Lecoanet, D., Cantiello, M., Quataert, E., Couston, L. A., Burns, K. J., Pope, B. J. S, **Jermyn, A. S.**, Favier, B., Le Bars, M. Low-frequency variability in massive stars: Core generation or surface phenomenon? *The Astrophysical Journal Letters* (2019, [arXiv](#)).
13. Kama, M., Shorttle, O., **Jermyn, A. S.**, Folsom, C. P., Furuya, K., Bergin, E. A., Walsh, C., Keller, L. Abundant refractory sulfur in protoplanetary disks. *The Astrophysical Journal* (2019, [arXiv](#)).
14. Paxton, B., ..., **Jermyn, A. S.**, ..., Timmes, F. X. Modules for Experiments in Stellar Astrophysics (MESA): Pulsating Variable Stars, Rotation, Convective Boundaries, and Energy Conservation. *The Astrophysics Journal Supplement Series* (2019, [arXiv](#)).
15. Fuller, J., Piro, A. L., **Jermyn, A. S.** Slowing the Spins of Stellar Cores. *Monthly Notices of the Royal Astronomical Society* (2019, [arXiv](#)).
16. Corts, E, Xie, W, Cambiasso, J, **Jermyn, A. S.**, Sundararaman, R, Narang, P, Schlücker, S, Maier, S. Plasmonic hot electron transport drives nano-localized chemistry. *Nature Communications* (2017, [arXiv](#)).
17. Narang, P\*, Sundararaman, R\*, **Jermyn, A. S.**, Atwater, H, Goddard, W. Cubic nonlinearity driven upconversion in high-field plasmonic hot carrier systems. *The Journal of Physical Chemistry C* (2016).
18. Sundararaman, R\*, Narang, P\*, **Jermyn, A. S.\***, Atwater, H, Goddard, W. Theoretical predictions for hot carrier generation from surface plasmon decay. *Nature Communications* (2014).

## Unrefereed Publications

1. Hubinger, E., Denison, C., ..., **Jermyn, A. S.**, ..., Schiefer, N., Perez, E. Sleeper Agents: Training Deceptive LLMs that Persist Through Safety Training. (2024, [arXiv](#)).
2. Anthropic Circuits Update: January 2024. [Anthropic](#).
3. Bricken, T., Templeton, A., Batson, J., Chen, B., **Jermyn, A. S.**, Conerly, T., Turner, N. L., Anil, C., Denison, C., Askell, A., Lasenby, R., Wu, Y., Kravec, S., Schiefer, N. Maxwell, T., Joseph, N., Tamkin, A., Nguyen, K., McLean, B., Burke, J. E., Hume, T., Carter, S., Henighan, T., Olah, C. Towards Monosemanticity: Decomposing Language Models With Dictionary Learning. [Anthropic](#).
4. Anthropic Circuits Update: July 2023. [Anthropic](#).
5. Anthropic Circuits Update: May 2023. [Anthropic](#).
6. **Jermyn, A. S.**, Schiefer, N., Hubinger, E. Engineering Monosemanticity in Toy Models. (2022, [arXiv](#)).
7. Lau, M. Y. M., Cantiello, M., **Jermyn, A. S.**, MacLeod, M., Mandel, I., Price, D. J. Hot Jupiter engulfment by a red giant in 3D hydrodynamics. (2022, [arXiv](#)).
8. **Jermyn, A. S.**, Fuller, J. Wave heating during the helium flash and lithium-enhanced clump stars. (2022, [arXiv](#)).
9. **Jermyn, A. S.**, Kama, M. Inferring the Gas-to-Dust Ratio in the Main Planet-Forming Region of Disks. (2022, [RNAAS](#), [arXiv](#)).
10. Varnavides, G., **Jermyn, A. S.**, Anikeeva, P., Narang, P. Probing carrier interactions using electron hydrodynamics. (2022, [arXiv](#)).
11. Anders, E. H., Bauer, E. B., **Jermyn, A. S.**, Van Kooten, S. J., Brown, B. P., Hester, E. W., Wilkinson, M., Goldberg, J. A., Varesano, T., Lecoanet, D. Moosinesq Convection in the Cores of Moosive Stars. (2022, [arXiv](#)).
12. **Jermyn, A. S.**, Timmes, F. X. Modifying the Free Energy in Skye. (2022, [RNAAS](#)).
13. Anders, E. H., **Jermyn, A. S.**, Lecoanet, D., Fuentes, J. R., Korre, L., Brown, B. P., Oishi, J. S. Convective Boundary Mixing Processes. (2022, [RNAAS](#)).



14. **Jermyn, A. S.**, Anders, E. H., Lecoanet, D., Cantiello, M., Goldberg, J. A. Measures of Efficiency of Convection. (2022, [RNAAS](#)).
  15. **Jermyn, A. S.**, Chitre, S. M, Tout, C. A. Energy Budget of the Solar Cycle. (2019, [RNAAS](#)).
  16. Izzard, R. G., **Jermyn, A. S.** Post-AGB discs from common-envelope evolution. *Galaxies* 6, 97 (2018, [arXiv](#)).
  17. **Jermyn, A. S.** Bounding the Radius of Convergence of Analytic Functions. (2017, [arXiv](#)).
  18. Halabi, G. M., Izzard, R. G., Tout, C. A., **Jermyn, A. S.**, Cannon, R. 2DStars: A two-dimensional stellar evolution code. *Mem. S.A.It.* 75, 282 (2017, [NASA ADS](#)).
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## Invited Talks

1. **Jermyn, A. S.**, Dittmann, A. J., Cantiello, M., Perna, R. Stellar Evolution in AGN Stars. Caltech Astronomy Colloquium (2021).
2. **Jermyn, A. S.**, Dittmann, A. J., Cantiello, M., Perna, R. Stellar Evolution in AGN Stars. Harvard CfA Seminar (2021).
3. **Jermyn, A. S.** Time-Dependent Convection in MESA. UCSB Bildsten group meeting (2021).
4. **Jermyn, A. S.**, Schwab, J., Bauer, E., Timmes, F. X., Potekhin, A. Skye: A Differentiable Equation of State. Princeton Astro Coffee (2021).
5. **Jermyn, A. S.**, Schwab, J., Bauer, E., Timmes, F. X., Potekhin, A. Skye: A Differentiable Equation of State. UCSB Bildsten group meeting (2021).
6. **Jermyn, A. S.**, Dittmann, A. J., Cantiello, M., Perna, R. Stellar Evolution in the Disks of Active Galactic Nuclei Produces Rapidly Rotating Massive Stars. University of Missouri Colloquium (2021).
7. **Jermyn, A. S.**, Tayar, J., Fuller, J., Tides, Differential Rotation and Eclipsing Binaries. CCA Stars Meeting (2021).
8. **Jermyn, A. S.**, Cantiello, M. The Origin of the Bimodal Distribution of Magnetic Fields in Early-type Stars. AAS Author Chat (2020).
9. **Jermyn, A. S.**, Cantiello, M., Lin, D. Stellar Evolution in AGN Disks. Where the Wild Things Are Workshop, Flatiron (2020).
10. **Jermyn, A. S.**, Cantiello, M., Lin, D. Stellar Evolution in AGN Disks. Princeton Astro Coffee. (2020).
11. **Jermyn, A. S.**, Tayar, J., Fuller, J., Tides, Differential Rotation and Eclipsing Binaries. KITP Exostars Redux Conference (2020).
12. **Jermyn, A. S.**, Kama, M., Linking Stellar Composition with Accreting Material. Flatiron/CCA Planet Formation Group Meeting (2020).
13. **Jermyn, A. S.** Differential Rotation in Convecting Stars. Cornell Astronomy Lunch Seminar (2020).
14. **Jermyn, A. S.** Electron Hydrodynamics and Stellar Astrophysics: Testbeds for Exotic Fluid Behavior. Harvard SEAS Special Seminar (2019).
15. **Jermyn, A. S.** Convection and Angular Momentum Tutorial. Flatiron/CCA Compact Objects Group Meeting (2019).
16. **Jermyn, A. S.** MESA Tutorial. ExoStars KITP Meeting. [Zenodo Materials](#) (2019).
17. **Jermyn, A. S.**, Gandhi, S. N., Phinney, E. S. Circulations in Irradiated Stars and Giant Planets. UC Berkeley TAC Seminar (2019).
18. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. ZTF Theory Meeting (2018).
19. **Jermyn, A. S.**, Kama, M Probing the composition of disks and planets through accretion onto radiative stars. Cambridge Stars Group Talk (2018).
20. **Jermyn, A. S.** Turbulence with Tensor Networks. Pappalardo Finalist Talk (2017).
21. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. Caltech Tea Talk (2017).
22. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. UCSB Lunch Talk (2017).

23. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. Princeton Lunch Talk (2017).
24. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. Harvard CfA Group Meeting (2017).
25. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Enhanced Rotational Mixing in Massive Stars. MIT Astro Brown Bag Lunch Talk (2017).
26. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. Mixer: Numerical Perturbation Theory for Turbulence. Harvard ITC Lunch Seminar (2017).
27. **Jermyn, A. S.**, Narang, P., Sundararaman, R. Charge Transport: Ballistics and Diffusion. Kavli Discussion, Harvard SEAS (2017).
28. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M., Lesaffre, P. Meridional Flow and Mixing in Massive Stars. Cake Talk, Neils Bohr Institute, University of Copenhagen (2017).
29. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M., Lesaffre, P. Meridional Flow and Mixing in Massive Stars. Lunch Seminar, Institute of Astronomy, University of Cambridge (2017).
30. **Jermyn, A. S.**, Phinney, E.S. The Atmospheric Dynamics of Pulsar Companions. Apker Prize, APS April (2016).
31. **Jermyn, A. S.**, Mong, R, Alicea, J, Stability of zero-modes in parafermion chains. Institute for Quantum Information and Matter (2014).

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## Contributed Talks

1. **Jermyn, A. S.**, Dittmann, A. J., Cantiello, M., Perna, R. AGN Stars Spin Fast. Flatiron CCA Lunch Talk (2021).
2. **Jermyn, A. S.**, Schwab, J., Bauer, E., Timmes, F. X. Skye: A Differentiable Equation of State. Flatiron CCA Lunch Talk (2021).
3. **Jermyn, A. S.**, Fuller, J. Lithium Production on the Red Clump. Flatiron CCA Lunch Talk (2020).
4. **Jermyn, A. S.**, Cantiello, M. Origin of Magnetic Fields in O/B/A Stars. Flatiron CCA Lunch Talk (2020).
5. **Jermyn, A. S.**, Timmes, F. Post-AGB Pulsators. Flatiron CCA Lunch Talk (2020).
6. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M., Lesaffre, P. Differential Rotation in Stellar Convection Zones. Universality: Turbulence Across Scales conference (2019).
7. **Jermyn, A. S.**, Tayar, J., Fuller, J. Differential Rotation in Convective Envelopes: Constraints from Eclipsing Binaries. Flatiron CCA Lunch Talk (2019).
8. **Jermyn, A. S.**, Kama, M, Linking Stellar Composition with Accreting Material. UCSB Lunch Talk (2018).
9. **Jermyn, A. S.**, Lesaffre, P, Tout, C. A., Chitre, S. M. (2018), Enhanced Rotational Mixing in Massive Stars. UK National Astronomical Meeting.
10. **Jermyn, A. S.** Efficient Contraction of Unstructured Tensor Networks. APS March (2018).
11. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M., Lesaffre, P. Meridional Flow and Mixing in Massive Stars. Bridge Chemical Evolution Meeting (2017).
12. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M., Lesaffre, P. Tidal Heating and Solar Irradiation of Hot Jupiters. Churchill Conference on Everything (2017).
13. **Jermyn, A. S.** Automatic Renormalization of Local Tensor Networks. APS March (2017).
14. **Jermyn, A. S.**, Phinney, E.S. Exterior Stellar Heating. APS Apker Finalist Seminar (2015).
15. **Jermyn, A. S.**, Sundararaman, R., Narang, P., Goddard, W., Atwater, H. Plasmonic Hot Carrier Transport and Collection in Nanostructures. APS March (2015).
16. **Jermyn, A. S.**, Phinney, E.S. Exterior Stellar Heating. Caltech SURF Seminar (2014).
17. **Jermyn, A. S.**, Mong, R., Alicea, J., Robustness of zero-modes in parafermion chains. APS March (2014).
18. **Jermyn, A. S.**, Alicea, J., Mong, R. The Stability of Zero Energy Edge Modes in 1D Quantum Chains. Caltech SURF Seminar (2013).

19. **Jermyn, A. S.** The Fluid Behavior of Electron Aggregates. Massachusetts Junior Academy of Sciences Symposium (2010).

## Posters

1. **Jermyn, A. S.**, Lesaffre, P, Tout, C, A 2D Magnetic Mixing Length Theory. Cambridge Fluids Network Meeting (2016).
2. Sundararaman, R, Narang, P, **Jermyn, A. S.**, Brown, A, Goddard, W, Atwater, H, Generation and transport of hot carriers in plasmonic nanostructures. Joint Center for Artificial Photosynthesis All-Hands Meeting (2015).
3. Narang, P, Sundararaman, R, **Jermyn, A. S.**, Bouma, L, Goddard, W, Atwater, H, Surface Plasmon Decay Dynamics: A Feynman Diagram Approach. Gordon Research Conference (2014).
4. Sundararaman, R, Narang, P, **Jermyn, A. S.**, Atwater, H, Goddard, W, First principles theory of plasmonic hot carrier generation in nano-structured systems. Gordon Research Conference (2014).
5. Narang, P, Sundararaman, R, **Jermyn, A. S.**, Localized Surface Plasmon Decay Dynamics. MRS Spring (2014).
6. Sundararaman, R, Narang, P, **Jermyn, A. S.**, Atwater, H, Goddard, W, First Principles Calculations for Surface Plasmon Decays and Solvation Models for Surfaces in Solution. Joint Center for Artificial Photosynthesis All-Hands (2014).
7. Narang, P, Sundararaman, R, **Jermyn, A. S.**, Creel, E, Atwater, H, Goddard, W, Plasmon-driven Solar Energy Conversion and Catalysis: A First Principles Study. Joint Center for Artificial Photosynthesis All-Hands Meeting (2014).
8. Markovic, N, Silverman, S, **Jermyn, A. S.**, Rivera, R. Optical Properties of Unfunctionalized Ultra-Short Carbon Nanotubes. Poster 135, MRSEC Summer Research Experience Poster Session (2010).

## Teaching

### Princeton Teaching Assistant:

Astrophysics 514 - Structure of the Stars 2021-2022

### UCSB Teaching Assistant:

MESA Summer School 2019

### Cambridge Supervisor:

Mathematics: Numerical Analysis (Part IB) 2018  
Mathematics: Mathematical Biology (Part II) 2017  
Mathematics: Binary Stars (Part III - Masters Course) 2017  
Mathematics: Computational Projects (Part IB) 2016  
Mathematics: Structure and Evolution of Stars (Part III - Masters Course) 2016  
Natural Sciences: Mathematics (Part IA) 2016  
Physics: Astrophysical Fluid Dynamics (Part II) 2015

### Caltech Teaching Assistant:

Ph101 - Order of Magnitude Physics (Prof. E. S. Phinney) 2015  
Ph11 - Freshman Research Tutorial (Profs. David Stevenson and Rob Phillips) 2014-2015  
Ph7 - Radiation Lab (Graduate TA/Section Leader for Dr. Frank Rice) 2014  
Ph6 - Atomic Physics Lab (Graduate TA/Section Leader for Dr. Frank Rice) 2014  
Ph5 - Analog Circuits Lab (Undergraduate TA for Dr. Frank Rice) 2013  
Ph6 - Atomic Physics Lab (Undergraduate TA for Dr. Frank Rice) 2013

### Caltech Tutor:

Ph205a - Relativistic Quantum Field Theory 2014-2015  
Ph106 - Graduate Classical Mechanics and Electromagnetism 2013-2015  
Ph127 - Graduate Statistical Physics 2013-2015  
Ph236a - General Relativity 2013-2015  
Ch1 - Freshmen Chemistry 2012-2015  
Ma1 - Freshmen Math (Analysis, Linear Algebra, Multivariable Calculus) 2012-2015  
Ma2 - Sophomore Math (Probability, Statistics, and Differential Equations) 2012-2015  
Ph2 - Sophomore Physics (Waves, Quantum Mechanics, and Thermodynamics) 2012-2015  
Ph12 - Advanced Sophomore Physics (Waves, Quantum Mechanics, and Thermodynamics) 2012-2015



ACM95 - Graduate Methods of Applied and Computational Mathematics	2012-2015
Ph125 - Graduate Quantum Mechanics	2012-2015
<b>Caltech Guest Lecturer:</b>	
Ph50 - Physics League (Seminar)	2017
Ph11 - Freshman Research Tutorial	2013, 2016, 2017
<b>Unaffiliated Tutor:</b>	
High School Physics Olympiad Preparation	2016
<b>Other:</b>	
Experimental Design (Thin Film Deposition) for Senior Lab	2014
Editor, Ph5 Laboratory Manual	2013

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## Service

<b>Referee:</b>	
NASA ATP Review Panel for Stars	2021
Astronomy and Astrophysics	2020-2021
The Astrophysical Journal	2020-2021
The Astronomical Journal	2020-2021
Physical Review Letters	2020-2021
Monthly Notices of the Royal Astronomical Society	2020-2021
<b>Flatiron Institute:</b>	
Session Chair for Conference “Universality: Turbulence across Scales”	2019
<b>KITP:</b>	
Diversity Coordinator for KITP program “Probes of Transport in Stars”	2020-2021
Co-organizer of the KITP Local’s Lunch Seminars	2018-2019
<b>Cambridge:</b>	
Representative to the Institute of Astronomy Athena SWAN/Juno committee	2016-2017
Institute of Astronomy Computing Users’ Committee	2017
Astronomy Graduate Student Forum Representative	2015-2017
Representative to the School of Physical Sciences Graduate Education Committee Workshop	2016
<b>Caltech:</b>	
Search Committee for the Vice President for Student Affairs	2014-2015
Dean’s Advisory Council	2014-2015
Contributing Writer - The California Tech	2014-2015
Academics and Research Committee	2012-2015
Curriculum Committee	2012-2015
Commencement Speaker Selection Committee	2014-2015
Physics Student Faculty Conference Committee	2013-2015
Physics Option Mentor	2013-2015
Upperclassmen Counselor	2013-2015
Council for Undergraduate Education	2013-2015
Information Management Systems and Services Representative	2012-2015
Title IX Committee	2014-2015
Faculty Board Ad Hoc Honor Code Task Force	2013-2014
Undergraduate Honor Code Committee	2013-2014
Housing Stewardship Committee	2013-2014
Dabney House Treasurer	2013-2014
Computer Advisory Committee	2012-2014
Dabney House Comptroller	2012-2013

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## Outreach

<b>Talks:</b>	
Stars over Time. Springfield MA Telescope and Reflector Society	2021
Tides and Eclipsing Binaries. Springfield MA Telescope and Reflector Society	2020
Recurring guest speaker at various Massachusetts Amateur Astronomy Societies	2006-2019
Mixing in Massive Stars. Churchill MCR Outreach Series	2017
Caltech Teaching Conference Opening Session. Caltech CTLO	2014
A Summer of Physics. Skyscrapers Amateur Astronomical Society of Rhode Island	2011

**Writing:**

Quantum Frontiers Guest Post: <a href="#">Explaining the modern economy to ancient Romans</a>	2019
Chapter on the history of stellar dynamics in a <a href="#">biography of James Jeans</a>	2017
MassLive Guest Column: <a href="#">Gravitational waves open new window to cosmos</a>	2016
Contributed to <a href="#">The Martian: A Technical Commentary</a>	2015

**Volunteering:**

Volunteer at Cambridge Science Festival	2016-17
Co-Organized Institute of Astronomy Undergraduate Journal Club	2016-17
Volunteer at Cambridge Institute of Astronomy Public Outreach events	2016

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**Employment**

Undergraduate IT Support	2011-14
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**Skills****Programming Languages:**

Experienced: Python (NumPy/SciPy), Mathematica, Fortran, Matlab

Familiar: Java, C++, C, Bash

**Other:**

Programming and using Finite Element codes  
 Density Matrix Renormalization Group methods  
 Markov Chain and Nested Sampling methods  
 Massively parallel programming  
 Finite Difference Time Domain EM Simulations  
 Familiarity with Unix/Linux environments

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**Professional Memberships**

Royal Astronomical Society	2016-2022
Association of Marshall Scholars	2015-2022
American Physical Society	2013-2022
Materials Research Society	2012-2015

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