# Adam S. Jermyn

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Work: Center for Computational Astrophysics, Flatiron Institute, New York, New York, 10010, USA
Online: adamjermyn@gmail.com, adamjermyn.com, GitHub


## Education

PhD, Astronomy, University of Cambridge, Churchill College, Institute of Astronomy — 2015-18
Dissertation: Turbulence and Transport in Stars and Planets
Supervisors: Christopher Tout and Gordon Ogilvie

BS, Physics, California Institute of Technology — 2011-15
Senior Thesis: The Atmospheric Dynamics of Pulsar Companions
Thesis Advisor: Sterl Phinney
Academic Advisors: Tom Tombrello and Jason Alicea

## Research

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

## Grants

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

## Awards

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. "Jermyn's 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

Awarded for an N-body plasma simulation.

## Mentoring

**Graduate Students**

*Eoin Farrell*: Projects on subsurface convection and magnetism in early-type stars (1 paper). 2021-2022

*Alexander Dittmann*: Projects on stellar evolution in AGN disks (2 papers). 2020-2022

*George Varnavides*: Projects on electron & phonon transport, hydrodynamics (2 papers). 2017-2022

*Evan Anders*: Projects on convective boundaries in massive stars (1 paper). 2019-2020

**Undergraduate Students**

*Aidan Simpson*: Summer research project on stellar evolution in AGN disks. 2020

*Jackie Lodman*: Research project on star formation and cosmic rays (1 paper). 2018

## 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

2D Stars - Cambridge 2D Stellar Evolution Code 2015-2018

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

AstroMicroPhysics - Python astronomical microphysics package 2015

QuantumChains - Numerical Spin Chain Calculation Package (GPLv3, github) 2013-2014

NanoImage - Atomic Force Microscopy Analysis (USPTO 13/534428) 2010-2011

## Patents

**Jermyn, A. S.**, Silverman, J, Markovic, N, "System for Lightweight Image Processing", US Patent Number US 9,097,739 B2 (Filed 2011, Awarded 2015).

## Peer-Reviewed Papers

### First or Second Author

1. **Jermyn, A. S.**, Anders, E. H., Cantiello, M. A Transparent Window into Early-Type Stellar Variability. The Astrophysical Journal (2022, arXiv).
2. **Jermyn, A. S.**, Cantiello, M. Magnetic Archaeology of Early-Type Stellar Dynamos. The Astrophysical Journal (2021, arXiv).

3. Anders, E. H., **Jermyn, A. S.**, Lecoanet, D., Brown, B. P. Stellar convective penetration: parameterized theory and dynamical simulations. The Astrophysical Journal (2021, arXiv).
4. **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).
5. **Jermyn, A. S.**, Schwab, J., Timmes, F. X., Bauer, E. Potekhina, A. Y. Skye: A Differentiable Equation of State. The Astrophysical Journal (2021, arXiv).
6. Cantiello, M. **Jermyn, A. S.**, Lin, D. N. C. Stellar Evolution in AGN Disks. The Astrophysical Journal (2021, arXiv). **Featured in AAS NOVA.**
7. Gandhi, S. N., **Jermyn, A. S.** Coupled Day-Night Models of Exoplanetary Atmospheres. Monthly Notices of the Royal Astronomical Society (2020, arXiv).
8. **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).
9. **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).
10. 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).
11. **Jermyn, A. S.**, Cantiello, M. The Origin of the Bimodal Distribution of Magnetic Fields in Early-type Stars. The Astrophysical Journal (2020, arXiv).
12. Shindler, F., **Jermyn, A. S.** Algorithms for Tensor Network Contraction Ordering. Machine Learning: Science and Technology (2020, arXiv).
13. **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).
14. **Jermyn, A. S.** Automatic Contraction of Unstructured Tensor Networks. SciPost Physics (2020, ).
15. Steinhardt, C. L., **Jermyn, A. S.**, Lodman, J. Thermal Regulation and the Star-Forming Main Sequence. The Astrophysical Journal (2019, arXiv).
16. **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).
17. Varnavides, G., **Jermyn, A. S.**, Anikeeva, P., Narang, P. Non-Equilibrium Phonon Transport Across Nanoscale Interfaces. Physical Review B (2019, arXiv).
18. **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).
19. **Jermyn, A. S.** Efficient Decomposition of High-Rank Tensors. Journal of Computational Physics (2019, arXiv).
20. **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).
21. **Jermyn, A. S.**, Tout, C. A., Chitre, S. M. Enhanced Mixing in Massive Rotating Stars. Monthly Notices of the Royal Astronomical Society (2018, arXiv).
22. Rasmussen, A*, **Jermyn, A. S.*** Gapless Topological Order, Gravity, and Black Holes. Physical Review B (2018, arXiv).
23. **Jermyn, A. S.**, Kama, M. Stellar Photospheric Abundances as a Probe of Disks and Planets. Monthly Notices of the Royal Astronomical Society (2018, arXiv).
24. **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.**
25. 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).
26. 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).
27. **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).

28. 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**.
29. **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. 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).
2. Dittmann, A. J., Cantiello, M., **Jermyn, A. S.**. Accretion onto Stars in the Disks of Active Galactic Nuclei. The Astrophysical Journal (2021, arXiv).
3. 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).
4. 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).
5. 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).
6. 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).
7. 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).
8. Fuller, J., Piro, A. L., **Jermyn, A. S.** Slowing the Spins of Stellar Cores. Monthly Notices of the Royal Astronomical Society (2019, arXiv).
9. Cortés, 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).
10. 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).
11. Sundararaman, R*, Narang, P*, **Jermyn, A. S.***, Atwater, H, Goddard, W. Theoretical predictions for hot carrier generation from surface plasmon decay. Nature Communications (2014).

## Research Notes

1. **Jermyn, A. S.**, Timmes, F. X. Modifying the Free Energy in Skye. (2022, RNAAS)
2. 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).
3. **Jermyn, A. S.**, Anders, E. H., Lecoanet, D., Cantiello, M., Goldberg, J. A. Measures of Efficiency of Convection. (2022, RNAAS).
4. **Jermyn, A. S.**, Chitre, S. M, Tout, C. A. Energy Budget of the Solar Cycle. (2019, RNAAS).

## Preprints

1. **Jermyn, A. S.** Bounding the Radius of Convergence of Analytic Functions. (2017, arXiv).

## Conference Proceedings

1. Izzard, R. G., **Jermyn, A. S.** Post-AGB discs from common-envelope evolution. Galaxies 6, 97 (2018, arXiv).
2. 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).

## Submitted Papers

1. 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. 2022.
2. Farrell, E., **Jermyn, A. S.**, Cantiello, M., Foreman-Mackey, D. The Initial Magnetic Field Distribution in AB Stars. 2022.
3. **Jermyn, A. S.**, Anders, E. H., Lecoanet, D., Cantiello, M. Convective Penetration in Early-Type Stars. 2022.
4. **Jermyn, A. S.**, Dittmann, A. J., McKernan, B., Ford, K. E. S., Cantiello, M. Effects of an Immortal Stellar Population in AGN Disks. 2022.
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. 2021.
6. 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. 2021.
7. 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.
8. 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. 2021.
9. Izzard, R. G., **Jermyn, A. S.**. Circumbinary discs for stellar population models. 2021.

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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).

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## 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, Goddward, 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).

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## Teaching

**Princeton Teaching Assistant:**

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| Astrophysics 514 - Structure of the Stars | 2021-2022 |

**UCSB Teaching Assistant:**

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| MESA Summer School | 2019 |

**Cambridge Supervisor:**

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| 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:**

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|---|---|
| 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

**Caltech Guest Lecturer:**

Ph50 - Physics League (Seminar) 2017
Ph11 - Freshman Research Tutorial 2013, 2016, 2017

**Unaffiliated Tutor:**

High School Physics Olympiad Preparation 2016

**Other:**

Experimental Design (Thin Film Deposition) for Senior Lab 2014
Editor, Ph5 Laboratory Manual 2013

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## Service

**Referee:**

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

**Flatiron Institute:**

Session Chair for Conference "Universality: Turbulence across Scales" 2019

**KITP:**

Diversity Coordinator for KITP program "Probes of Transport in Stars" 2020-2021
Co-organizer of the KITP Local's Lunch Seminars 2018-2019

**Cambridge:**

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

**Caltech:**

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

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| Housing Stewardship Committee | 2013-2014 |
| Dabney House Treasurer | 2013-2014 |
| Computer Advisory Committee | 2012-2014 |
| Dabney House Comptroller | 2012-2013 |

## Outreach

**Talks:**

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| Stars over Time. Sprintfield 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:**

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

**Volunteering:**

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| 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 |

## Employment

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| Undergraduate IT Support | 2011-14 |

## 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

## Professional Memberships

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