

# H Perry Hatchfield

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## Contact Information

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## Education

2016-Present **University of Connecticut**, Storrs, CT.  
PhD Candidate Department of Physics  
2012-2016 **Oberlin College**, Oberlin, OH.  
B.A. with High Honors in Physics, B.A. in Creative Writing

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## Research Experience

2017-Present **University of Connecticut, Department of Physics**, Storrs, CT.  
**Research with Dr. Cara Battersby**, studying star formation, gas flows, and turbulence in the Milky Way's Galactic Center. Member of the CMZoom collaboration, lead the design of the CMZoom catalog of possible sites of massive star forming regions in the central molecular zone

2018-Present **Universität Heidelberg, Institute of Theoretical Astrophysics**, Heidelberg, Germany.  
Research position in collaboration with Dr. Ralf Klessen and Dr. Mattia Sormani. Designing, running, and analyzing AREPO simulations of gas dynamics and star formation in the Milky Way's Galactic Center. Experience using high performance computing resources to perform high resolution hydrodynamical simulations

Summer 2017 **Harvard University**, Cambridge, MA.  
Summer research appointment with Dr. Cara Battersby

2016-2017 **University of Connecticut, Department of Physics**, Storrs, CT.  
**Research with Dr. Gerald Dunne** Research in applications of Random Matrix Theory to characterize resurgence phenomena in quantum mechanical systems

2014-2016 **Oberlin College, Department of Physics**, Oberlin, OH.  
**Research with Dr. Rob Owen** Research in numerical relativity, including gravitational lensing simulations, general relativistic fluid dynamics, post-Minkowskian and post-Newtonian formalisms, vortex-tendex field decompositions, visualization of gravitoelectromagnetic field lines

Winter 2015 **University of Florence, Department of Physics and Astronomy**, Florence, Italy.  
**Research with Dr. Francesco Becattini** Relativistic and nonrelativistic limits of stress energy tensor components for a fluid in a weak gravitational field

Winter 2014 **Museum of Fine Arts, Boston**, Boston, MA.  
**Internship in Conservation Engineering** Performed Visible Induced Luminescence (VIL) analysis of ancient pigments on Etruscan sarcophagi. Use of machine shop, including welding training, use of machining mill, lathe, drill press, and band saw

2010-2011 **Boston University, Department of Physics**, Boston, MA.  
**Research internship with Dr. Richard Averitt** Designed and carried out experiments using terahertz spectroscopy of metal ammonia solutions at low temperatures

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## Teaching, Outreach, and Science Writing Experience

2021 - Present Writer for Astrobites, a graduate student-run daily astrophysics literature journal which aims to make current research more accessible to undergraduates

Spring 2021 Co-instructor (IOR) for PHYS1025Q. Converted all course material to online format

Fall 2018, Fall 2020 Research Scientist and Writer for the Bitescis K12 program, working with classroom teachers to develop lesson plans based on current research in astronomy

Winter 2019 Invited Talk and Q&A at Avon High School, Avon CT  
2017 Eclipse viewing event at Horsebarn Hill, Storrs, CT.

2016 - 2017 University of Connecticut, Teaching Assistant in Physics and Astronomy (PHYS1502, PHYS1202, PHYS1025)

Fall 2015, Summer 2016 Summer 2016, Independent tutor for high school math and physics students

Fall 2014 - Spring 2015 Oberlin College, Course Assistant for Modern Physics and Classical Mechanics

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## Leadership and Mentoring Experience

2018 - Present Primary Mentor for 4 undergraduate researchers over the past 3 years working with Professor Cara Battersby. Acting as senior graduate student, assisting Professor Battersby in mentoring junior graduate students

2019 - 2021 President of the University of Connecticut Physics Graduate Student Association

2016 - 2019 Treasurer of the University of Connecticut Physics Graduate Student Association

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## Grants Awarded

2021 SOFIA Archival Research Proposal, Cycle 9. PI of the **IGNITES** project to study the thermal evolution of young stellar and pre-stellar objects in the central molecular zone

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## Awards, Fellowships and Honors

2018-2020 LSST Data Science Fellowship

Fall 2016, Fall 2017 Letter of Recognition for Excellence in Teaching Reviews, twice awarded

2016 Research Fellowship Award from the Kurt Haller Endowment for Physics Research and Graduate Education

2016 High Honors, Oberlin College Department of Physics and Astronomy

2012-2016 Oberlin College Dean's Scholarship

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## Computational Skills

**Expert Knowledge** Python, Jupyter Notebooks, astropy, matplotlib, CASA, DS9, Glueviz

**Significant Knowledge** Numba, SQL, Pytorch, Mathematica, Docker

**Working Knowledge** MATLAB, C, C++, Java, Solidworks

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## Invited Talks

- Dec. 2021 University of Kansas, Space Physics seminar (upcoming)
- Oct. 2021 Caltech, TAPIR Seminar talk (upcoming)
- Oct. 2021 Carnegie Institute, Lunch talk series (upcoming)
- Oct. 2021 UCLA, Galactic Center Group Lunch talk (upcoming)
- Oct. 2021 Flatiron Institute, Galaxy group lunch talk (upcoming)
- Oct. 2021 NRAO, Charlottesville, TUNA talk (upcoming)
- Oct. 2021 Harvard University, Center for Astrophysics, SMA Science Seminar (upcoming)
- Sep. 2021 Astronomy Research Seminar, University of Connecticut (upcoming)
- Jan. 2021 Research contributed talk at the 237th Meeting of the American Astronomical Society
- Dec. 2020 Greenbank Observatory, invited GBO/NRAO Science lunch talk, given remotely
- Jan. 2020 University of Connecticut, New England Star Formation Meeting
- Nov. 2019 Northeast CMZ Meeting at MIT Haystack Observatory

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## Posters Presented

- Dec. 2019 Harvard-Heidelberg Star Formation Meeting. Cambridge, MA.
- Dec. 2018 Harvard-Heidelberg Star Formation Meeting. Heidelberg, Germany.
- Jul. 2018 Tracing the FLOW: Galactic Environments and the Formation of Massive Stars. Windermere, United Kingdom.
- Dec. 2017 Harvard-Heidelberg Star Formation Meeting. Cambridge, MA.

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## Publications

### First or Second Author Contributions

- [1] Hatchfield, H Perry; Sormani, Mattia C.; Tress, Robin G.; Battersby, Cara; Smith, Rowan J.; Glover, Simon C. O.; Klessen, Ralf S., *Dynamically Driven Inflow onto the Galactic Center and its Effect upon Molecular Clouds*. 2021, accepted for publication in ApJ. [\[LINK\]](#)
- [2] Orr, M. E.; **Hatchfield, H.**; Battersby, C.; Hayward, C. C.; Hopkins, P. F.; Wetzel, A.; Benincasa, S. M.; Loebman, S. R.; Sormani, M. C.; Klessen, R. S., *Fierly Cores: Bursty and Smooth Star Formation Distributions across Galaxy Centers in Cosmological Zoom-in Simulations*, February. 2021, ApJL, 908, L31. [\[LINK\]](#)

- [3] **Hatchfield, H.**, Battersby, C., Keto, E., Walker, D., Barnes, A., Callanan, D., Ginsburg, A., Henshaw, J., Kauffmann, J., Kruijssen, J. M. D., Longmore, S. N., Lu, X., Mills, E. A. C., Pillai, T., Zhang, Q., Bally, J., Butterfield, N., Contreras, Y. A., Ho, L. C., Ott, J., Patel, N., Tolls, V., *CMZoom: Catalog of Compact Submillimeter Dust Continuum Objects in the Milky Way's Central Molecular Zone*, November. 2020, ApJS 251, 14. [\[LINK\]](#)

#### Other Collaborative Publications

- [4] Tress, R. G.; Sormani, M. C.; Glover, S. C. O.; Klessen, R. S.; Battersby, C. D.; Clark, P. C.; **Hatchfield, H.**; Smith, R. J., *Simulations of the Milky Way's central molecular zone - I. Gas dynamics*, December. 2020, MNRAS, 499, 4455. [\[LINK\]](#)
- [5] Sormani, M. C.; Tress, R. G.; Glover, S. C. O.; Klessen, R. S.; Battersby, C. D.; Clark, P. C.; **Hatchfield, H.**; Smith, R. J., *Simulations of the Milky Way's Central Molecular Zone - II. Star formation*, October. 2020, MNRAS, 497, 5024. [\[LINK\]](#)
- [6] Battersby, C., Keto, E., Walker, D., Barnes, A., Callanan, D., Ginsburg, A., **Hatchfield, H.**, Henshaw, J., Kauffmann, J., Kruijssen, J. M. D., Longmore, S. N., Lu, X., Mills, E. A. C., Pillai, T., Zhang, Q., Bally, J., Butterfield, N., Contreras, Y. A., Ho, L. C., Ott, J., Patel, N., Tolls, V., *CMZoom II: Survey Overview and First Data Release*, August. 2020, ApJS 249, 35. [\[LINK\]](#)
- [7] Sormani, M. C.; Tress, R. G.; Glover, S. C. O.; Klessen, R. S.; Barnes, A. T.; Battersby, C. D.; Clark, P. C.; **Hatchfield, H.**; Smith, R. J., *The geometry of the gas surrounding the Central Molecular Zone: on the origin of localized molecular clouds with extreme velocity dispersions*, October. 2019, MNRAS, 488, 4663. [\[LINK\]](#)