# Drummond B. Fielding

# Curriculum Vitae

Assistant Professor
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## Education

PhD 2018, MA 2014, Astrophysics, University of California, Berkeley. *Advisor: Eliot Quataert*
BS, BA 2012, Physics, Mathematics, Johns Hopkins University.

## Professional Appointments

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|---|---|
| Assistant Professor, Cornell University, Department of Astronomy | 2024– |
| Visiting Assistant Professor, Cornell University, Department of Astronomy | 2023–2024 |
| Flatiron Research Fellow, CCA | 2018–2024 |
| Visiting Scholar, Indian Institute of Science | 2016 |
| NSF & Berkeley Graduate Research Fellow, U.C., Berkeley | 2012–2018 |

## Active Research Interests

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| fluid dynamics | cosmic ray transport | magnetized turbulence | magnetic reconnection |
| galaxy formation | galactic winds | multiphase flows | geom. measure theory |
| plasma physics | circumgalactic medium | stellar+BH feedback | machine learning |

## Grant Support

Current

**PI**, NSF AAG, *Illuminating the Interplay of Multiphase Galactic Winds and the CGM*
- Graduate student funding and 1.5 months of summer funding per year

**Co-PI**, Legacy HST-AR, STScI, *Mocking Galactic Winds: A new approach to constraining feedback by modeling the UV spectra of galaxies*, 2025-2027
- Graduate student funding and one month of summer funding per year

**Co-PI**, Legacy HST-AR, STScI, *Galactic Winds Unveiled: Leveraging Cloud Simulations with Radiative Transfer to Constrain Feedback*, 2024-2026
- Graduate student funding and one month of summer funding per year

**PI**, multi-year INCITE, DOE, *Pushing the* Frontier *of Cosmic Ray Transport in Interstellar Turbulence*, 2025-2027
- First year: 4.8 Million GPU hours on *Frontier* & 1.6 Million GPU hours on *Aurora*

**PI**, INCITE, DOE, *Resolving Cosmic Ray Transport by pushing the* Frontier *of MHD Turbulence*, INCITE, PI, 2024
- 7.2 Million GPU hours on *Frontier* the world's first exascale supercomputer.

**Co-PI**, EURO HPC, *Resolving Turbulent Multiphase Gas Dynamics*, 2023-2025
- 7.2 Million GPU hours on *Lumi-G*.

**Co-I**, Support for Open-Source Tools, Frameworks, and Libraries, NASA, *AthenaK: a Performance Portable Simulation Infrastructure for Computational Astrophysics*, 2025-2027

Past

**Co-I**, KCWI, *DUVET: Mapping Outflows and the Inner CGM in Starbursting Disks*, 2020-
**PI**, APS-IUSSTF, *Visiting scholar grant to work Indian Institute of Science with Prof. Prateek Sharma*, 2016
**Co-I**, HST AR, *Towards an Understanding of the Origin of OVI in the Circumgalactic Medium*, 2017
**Co-I**, NSF XSEDE, *The Physics of Supernova Feedback: Global 3D Simulations of Galactic Disks*, 2016-2018
**Co-I**, NSF XSEDE, *Conduction, Convection, and Thermal Instability in Hot Halos*, 2016-2017

## Student advising

Current

*Brent Tan* — Postdoc — Cornell University
*Yongqi Zhang* — Graduate Student — Cornell University
*Bodong Liu* — Undergraduate Student — Cornell University

Past

*Iryna Butsky* — Graduate Student — UW + CCA predoctoral fellow → Hubble Fellow at Stanford
*Viraj Pandya* — Graduate Student — UC Santa Cruz + CCA predoctoral fellow → Hubble Fellow at Columbia
*Matthew Abruzzo* — Graduate Student — Columbia → Postdoc at UPitt
*Anthony Chow* — Graduate Student — Columbia
*Zirui Chen* — Undergraduate Student — Columbia → Grad Student at UCSB
*Brent Tan* — Graduate Student — UC Santa Barbara + CCA predoctoral fellow → Postdoc at CCA
*Minami Roy* — Graduate Student — Raman Research Institute + CCA predoctoral fellow → Postdoc at OSU
*Mitali Damle* — Graduate Student — University of Potsdam → Postdoc at NYU Abu Dhabi

## Teaching

Astro 1101: From New Worlds to Black Holes — Cornell University — 200+ undergraduates Fall 2024
Astro 6590: Galaxies and the Universe — Cornell University — graduate level Spring 2025

## Public outreach

Founder and leader of *The Astro Club*. Monthly meetings 2020–2023. Democracy Prep Charter Middle School, Harlem, NY.

Astronomy career day, Democracy Prep Charter Middle School, Harlem, NY 2019

Taught a month-long series of astronomy classes to 2nd and 3rd grade students. 2017. North Oakland Community Charter School, Oakland, CA

UC Berkeley Astronomy Department Public Liaison, 2015

*East Bay Astronomical Society* Public Lecture, 2014, Chabot Space and Science Center

*The Berkeley Compass Project* Summer Evening Instructor, 2013

## Professional services & community engagement

Founder and organizer of the **New York Area Fluid Dynamics Meeting**, a cross-disciplinary monthly meeting of local fluid dynamicists, 2020

Research Mentor, **Simons-National Society of Black Physicists** Scholars Program 2023

*Flatiron Pre-Doctoral Program* graduate student mentor, 2019–2024

Referee: MNRAS, ApJ, ApJL

Proposal evaluation panelist: NSF (2020), NASA (2024)

Summer research mentor for the Cornell *Nexus Scholars Program* 2024–

## Honors and awards

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| Outstanding Graduate Student Instructor Award | 2014 |
| NSF Graduate Research Fellowship | 2014–2017 |
| Berkeley Graduate Fellowship | 2012–2014 |
| Donald E. Kerr Award for Outstanding Physics Undergraduate | 2012 |

## Selected recent invited presentations

Endowed Colloquium, Niels Bohr Lecture, Niels Bohr Institute, Copenhagen (10/2024)
Seminar, Institute for Advanced Studies, Princeton (10/2024)
Colloquium, Flatiron Institute, Center for Computational Astrophysics (2/2024)
Invited Review, *New simulations for new problems in galaxy formation*, conference, Paris (12/2023)
Invited Talk, Salpeter Workshop on the Interstellar Medium, Cornell (12/2023)
Seminar, Computational Research in Boston and Beyond (CRIBB), MIT (12/2023)
Colloquium, Johns Hopkins University, Physics and Astronomy Department (11/2023)
Colloquium, Columbia University, Astronomy Department (10/2023)
Invited talk, *Interfaces and Mixing in Fluids, Plasmas, and Materials*, conference, KITP (9/2023)
Colloquium, Michigan State University, Physics and Astronomy Department (10/2023)
Invited Review, *MIST2023: Cosmic turbulence and Magnetic fields: physics of baryonic matter across time and scales*, conference (9/2023)
Invited talk, *CGM@ND*, conference (9/2023)
Invited talk, *New Views on Feedback & the Baryon Cycle in Galaxies*, conference (8/2023)
Invited talk, *Modeling multiphase astrophysical systems*, conference (5/2023)
Invited talk, *Jim's Fest/Athena++*, conference (5/2023)
Colloquium, Yale University, Astronomy Department (2/2023)
Colloquium, Cornell University, Astronomy Department (1/2023)
Invited Astrophysics Seminar, UIUC (11/2022)
Joint Astrophysics Colloquium, Pitt-CMU (10/2022)
Invited talk, *What Matter(s) Around Galaxies*, conference (9/2022)
Invited talk, *Ringberg Computational Galaxy Formation 2022*, conference (4/2022)
Invited talk, *Wolfe Symposium*, conference (3/2022)
Invited Seminar, Theoretical AstroPhysics Including Relativity & Cosmology, Caltech (12/2021)
Astronomy Department seminar, Racah Institute of Physics, Hebrew University of Jerusalem (12/2021)
Invited Talk, *Baltimore Wind Workshop*, Johns Hopkins University (8/2021)
Astrophysics Colloquium, UCSD-SDSU (4/2021)
Keynote speaker, KITP workshop *Fundamentals of Gaseous Halos* (1/2021)
Invited talk, KITP conference *On the Origin, Nature, and Mixing of Multiphase Gas in Astrophysics* (10/2020)
Gaggle Seminar, Carnegie Institution for Science (8/2020)
Invited talk, CLEARNESS conference IAP (6/2020)
CGI Colloquium, U.C. Santa Cruz (4/2020)
Contributed Talk, Universality of Turbulence Conference, Flatiron Institute, NY (12/2019)
SFIR Seminar, Princeton University (11/2019)
Astro Seminar, NYU CCPP, New York NY (10/2019)
Astronomy Colloquium, Raman Research Institute (12/2016)
Astronomy Department Colloquium, Indian Institute of Science (10/2016)