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

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

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 → Postdoc 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

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

Undergrad mentor UC Berkeley Astronomy, 2016-2017

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

NSF proposal evaluation panelist, 2020

NASA proposal evaluation panelist, 2024

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

Honors and awards

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)
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)
Theoretical AstroPhysics Including Relativity & Cosmology seminar, Caltech (12/2021)
Astronomy Department seminar, The 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)
Invited Talk, CGM conference, Berlin Germany (10/2019)
Invited seminar, Turbulence workshop, Aspen Center for Physics (6/2019)

Invited Talk, *athena++* conference, Las Vegas NV (3/2019)
Invited Talk, CGM conference, Northwestern, Chicago IL (8/2018)
Invited Talk, CGM/DLA conference, Big Sur CA (3/2018)
TAPIR Seminar, Caltech, Pasadena CA (11/2017)
Astronomy Colloquium, Raman Research Institute (12/2016)
Astronomy Department Colloquium, Indian Institute of Science (10/2016)