Benjamin Brown

Biographical Sketch

Department of Astrophysical and Planetary Sciences
University of Colorado, Boulder
bpbrown@colorado.edu

Professional Preparation

Harvey Mudd College	Physics	BS May 2003
University of Colorado, Boulder	Astrophysics	PhD August 2009
University of Wisconsin, Madison	Astronomy	Postdoc September 2009 – August 2013
University of California, Santa Barbara	KITP	Postdoc September 2013 – July 2014

Appointments

Assistant Professor	University of Colorado, Boulder	August 2014 –
Research Associate	Kavli Institute for Theoretical Physics	September 2013 – July 2014
Postdoctoral Fellow	University of Wisconsin, Madison	September 2009 – August 2013
NSF AAPF	University of Wisconsin, Madison	September 2009 – August 2013

Five Publications Most Relevant to Proposed Work (out of 34 total)

- Bordwell, B., **Brown**, B. P., & Oishi, J. S., "Convective dynamics and disequilibrium chemistry in the atmospheres of giant planets and brown dwarfs", 2018, *The Astrophysical Journal*, in press
- Lecoanet, D., Schwab, J., Quataert, E., Bildsten, L., Timmes, F. X., Burns, K. J., Vasil, G. M., Oishi, J. S., & **Brown**, B. P., "Turbulent chemical diffusion in convectively bounded carbon flames", 2016, *The Astrophysical Journal*, 832, 71:1–8
- Lecoanet, D., **Brown**, B. P., Zweibel, E. G., Burns, K., Oishi, J. S, & Vasil, G. M., "Conduction in low-Mach number flows: part I linear & weakly nonlinear regimes", 2014, *The Astrophysical Journal*, 797, 94:1–16
- Vasil, G. M., Lecoanet, D., **Brown**, B. P., Wood, T. S., & Zweibel, E. G., "Energy conservation and gravity waves in sound-proof treatments of stellar interiors: Part II Lagrangian constrained analysis", 2013, *The Astrophysical Journal* 773, 169:1–23
- **Brown**, B. P., Vasil, G. M., & Zweibel, E. G., "Energy conservation and gravity waves in sound-proof treatments of stellar interiors: Part I anelastic approximations", 2012, *The Astrophysical Journal* 756, 109:1–20

Synergistic activities

Brown is an expert in the stratified fluid dynamics of stars and planetary atmospheres. Brown has been involved in modelling stellar convection since 2003, when he began using the anelastic spherical harmonic (ASH) code to study the coupling of convection, rotation and magnetic dynamo action in the Sun and in other solar-type stars. He has published results on magnetohydrodynamic processes in stellar interiors, on convective wave generation and transport, and on fundamental properties of stratified fluid dynamics. He is a core member of the development team for the open-source Dedalus framework. He has extensive HPC experience and a history of success in obtaining large computing allocations. At University of Colorado, he leads a research group of four graduate students, two postdocs and two undergraduate students, working on topics in solar, stellar and exoplanetary dynamics. He has mentored two students through Masters level (Anders & Bordwell); both recieved highest honors in their research.