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Jeffrey Satoshi Oishi

Education

2007 **Ph.D.**, *University of Virginia*, Astronomy.

2000 **B.S.**, *Columbia University*, Applied Physics.

Experience

2014–present **Assistant Professor of Physics**, *Farmingdale State College*, Farmingdale, NY.

2014–present **Research Associate**, *American Museum of Natural History*, New York, NY.

2012–2014 **Research Scientist**, *American Museum of Natural History*, New York, NY.

2010–2012 **Postdoctoral Fellow**, *Kavli Institute for Particle Astrophysics and Cosmology, Stanford University*, Stanford, CA.

2008–2010 **Postdoctoral Fellow**, *University of California, Berkeley*, Berkeley, CA.

Grants Awarded

2015-2018 **NASA LWS Program**, *$944,231 (final budget pending)*.
"Stellar Insights into Solar Magnetism: Exploring Fundamental Dynamo Physics Across the Lower Main Sequence"
PI: Ben Brown (I am co-PI). Grant number 15-LWS15_2-0063.

Computer Time Awarded

CU Janus 4 Million CPU Hours

NSF XSEDE 1.6 Million CPU hours

Students Mentored

Undergraduate

2015–present **Rayhan Morales Castro**, *Farmingdale State College*, Electrical Engineering Technology.
working on magnetic reconnection

2014–2015 **Chris Hunter**, *Farmingdale State College*, (transferred to MIT).
worked on Dedalus Project test suite

2013 **Moeko Tamura**, *Barnard College*, Physics.
developed magnetic reconnection data analysis pipeline

2012 **Devan Conroy**, *Fairfield University*, Math.
implemented wavelet-based turbulence analysis method

2011–2012 **Keaton Burns**, *UC Berkeley*, Applied Math/Physics/Astronomy.
contributor to the Dedalus Project; now lead developer

2011 **Greg Peairs**, *Stanford University*, Physics.
worked on initial conditions for cosmological simulations

Graduate

2013–present **Susan Clark**, *Columbia University*, Astronomy.
working on weakly nonlinear magnetorotational instability

Recent Invited Talks

2015 School of Arts and Sciences Colloquium, Farmingdale State College

2015 New York Area Computational Astrophysics Group Meeting

2015 Astronomy Colloquium, Adler Planetarium

2015 Scientific Python Group, Leeds University

2014 KITP Program: Wave-Flow Interaction in Geophysics, Climate, Astrophysics, and Plasmas, Santa Barbara, CA

2013 Pencil Code Meeting, Lund, Sweden

2013 Astronomy Colloquium, Niels Bohr International Academy

2013 Wednesday Lunch Talk, Princeton University

2012 Astronomy Colloquium, University of Michigan

2012 Astronomy Colloquium, Michigan State University

2012 Instabilities and Structures in Protoplanetary Disks, Marseille, France

2012 Instructor, `yt` Workshop, FLASH Center, University of Chicago

Service

2015-present Panelist, NSF Division of Advanced Cyberinfrastructure

2013-present Panelist, NSF Division of Astronomical Science

2013-present Panelist, NASA Heliophysics

2013-present Referee, Monthly Notices of the Royal Astronomical Society

2012-present Referee, Astrophysical Journal Letters

2009-present Referee, Astrophysical Journal

2008-present Member, `yt` development team, an open-source, multi-platform data analysis and visualization toolkit (`http://yt-project.org`)

Outreach and Public Engagement

2015 **Adler After Dark**.
Public lecture on mathematics in astrophysics at the Adler Planetarium, Chicago, IL.

2013 **Columbia University Astronomy Outreach**.
Public lecture on Music, Noise, and Asteroseismology.

2013 **Astronomy On Tap**.
Public lecture on Music, Noise, and Asteroseismology in a bar in Brooklyn, NY.

2013–present **Science Train! (#ScienceTrain)**.
Minimalist, informal outreach project to answer questions about astronomy on the New York City subway.

2012 - 2014 **Coordinator, Science Bulletins**, *American Museum of Natural History*.
News and documentary productions bringing astronomical topics to the public.

2009 **Judge**, *COPUS Year of Science Zine Contest*.

2008 **Public talk**, *TriValley Stargazers*.

2007-present **Member & co-founder**, *Small Science Collective*.
a collective of artists and scientists creating science themed zines (`http://smallsciencezines.blogspot.com`)

Courses Taught

At Farmingdale

PHY117 Solar system astronomy (Fall 2014)

PHY121 Classical physics for non majors (Fall 2014)

PHY123 Particle physics & cosmology for non-majors (Fall 2015)

PHY125/126 Physics lab for non-majors (Spring 2015)

PHY135 Introductory algebra-based mechanics (lecture & lab) (all semesters)

PHY323 Advanced electrodynamics (Spring 2015)

PHY333 Modern physics (Fall 2015)

Elsewhere

"Constructing the Laws of Nature", Eugene Lang College (Fall 2012)

"Watching Flows: Visualization in Astrophysics", School of the Art Institute of Chicago (Winter 2012)

ASTR122 Introduction to the Stars, Galaxies, and the Universe, University of Virginia (Summer 2002)

References

Mordecai Mark-Mac Low
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American Museum of Natural History
212-496-3443
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Ben Brown
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Department of Astrophysical & Planetary Sciences
University of Colorado, Boulder
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Andrew Yang
Associate Professor
Liberal Arts
School of the Art Institute of Chicago
ayang@saic.edu

Publications

18 refereed; 1116 citations; h-index 12 (via NASA ADS)

Refereed

2015 G. M. Vasil, K. J. Burns, D. Lecoanet, S. Olver, B. P. Brown, and **J. S. Oishi**. Tensor calculus in polar coordinates using Jacobi polynomials. *J. Comp. Phys., submitted*, September 2015.

J. S. Oishi, M.-M. Mac Low, D. C. Collins, and M. Tamura. Self-generated Turbulence in Magnetic Reconnection. *ApJ*, 806:L12, June 2015.

D. Lecoanet, M. McCourt, E. Quataert, K. J. Burns, G. M. Vasil, **J. S. Oishi**, B. P. Brown, J. M. Stone, and R. M. O'Leary. A Validated Nonlinear Kelvin-Helmholtz Benchmark for Numerical Hydrodynamics. *MNRAS, submitted*, September 2015.

D. Lecoanet, M. Le Bars, K. J. Burns, G. M. Vasil, B. P. Brown, E. Quataert, and **J. S. Oishi**. Numerical simulations of internal wave generation by convection in water. *Phys. Rev. E*, 91(6):063016, June 2015.

2014 D. Lecoanet, B. P. Brown, E. G. Zweibel, K. J. Burns, **J. S. Oishi**, and G. M. Vasil. Conduction in Low Mach Number Flows. I. Linear and Weakly Nonlinear Regimes. *ApJ*, 797:94, December 2014.

G. L. Bryan, M. L. Norman, B. W. O'Shea, T. Abel, J. H. Wise, M. J. Turk, D. R. Reynolds, D. C. Collins, P. Wang, S. W. Skillman, B. Smith, R. P. Harkness, J. Bordner, J.-h. Kim, M. Kuhlen, H. Xu, N. Goldbaum, C. Hummels, A. G. Kritsuk, E. Tasker, S. Skory, C. M. Simpson, O. Hahn, **J. S. Oishi**, G. C. So, F. Zhao, R. Cen, Y. Li, and Enzo Collaboration. ENZO: An Adaptive Mesh Refinement Code for Astrophysics. *ApJS*, 211:19, April 2014.

2012 M. J. Turk, **J. S. Oishi**, T. Abel, and G. L. Bryan. Magnetic Fields in Population III Star Formation. *ApJ*, 745:154, February 2012.

J.-C. Passy, O. De Marco, C. L. Fryer, F. Herwig, S. Diehl, **J. S. Oishi**, M.-M. Mac Low, G. L. Bryan, and G. Rockefeller. Simulating the Common Envelope Phase of a Red Giant Using Smoothed-particle Hydrodynamics and Uniform-grid Codes. *ApJ*, 744:52, January 2012.

2011 M. J. Turk, B. D. Smith, **J. S. Oishi**, S. Skory, S. W. Skillman, T. Abel, and M. L. Norman. yt: A Multi-code Analysis Toolkit for Astrophysical Simulation Data. *ApJS*, 192:9, January 2011.

J. S. Oishi and M.-M. Mac Low. Magnetorotational Turbulence Transports Angular Momentum in Stratified Disks with Low Magnetic Prandtl Number but Magnetic Reynolds Number above a Critical Value. *ApJ*, 740:18, October 2011.

2010 P. Chang and **J. S. Oishi**. On the Stability of Dust-laden Protoplanetary Vortices. *ApJ*, 721:1593–1602, October 2010.

2009 **J. S. Oishi** and M.-M. Mac Low. On Hydrodynamic Motions in Dead Zones. *ApJ*, 704:1239–1250, October 2009.

2008 J. L. Maron, M.-M. Mac Low, and **J. S. Oishi**. A Constrained-Transport Magnetohydrodynamics Algorithm with Near-Spectral Resolution. *ApJ*, 677:520–529, April 2008.

2007 **J. S. Oishi**, M.-M. Mac Low, and K. Menou. Turbulent Torques on Protoplanets in a Dead Zone. *ApJ*, 670:805–819, November 2007.

M.-M. Mac Low, J. Toraskar, **J. S. Oishi**, and T. Abel. Dynamical Expansion of H II Regions from Ultracompact to Compact Sizes in Turbulent, Self-gravitating Molecular Clouds. *ApJ*, 668:980–992, October 2007.

A. Johansen, **J. S. Oishi**, M.-M. Mac Low, H. Klahr, T. Henning, and A. Youdin. Rapid planetesimal formation in turbulent circumstellar disks. *Nature*, 448:1022–1025, August 2007.

2006 **J. S. Oishi** and M.-M. Mac Low. The Inability of Ambipolar Diffusion to Set a Characteristic Mass Scale in Molecular Clouds. *ApJ*, 638:281–285, February 2006.

2003 R. A. Chevalier and **J. Oishi**. Cassiopeia A and Its Clumpy Presupernova Wind. *ApJ*, 593:L23–L26, August 2003.

Unrefereed

2015 **J. S. Oishi** and K. Menou. Magnetorotational instability in the presence of composition gradients. In *American Astronomical Society Meeting Abstracts*, volume 225 of *American Astronomical Society Meeting Abstracts*, page #133.04, January 2015.

2014 **J. S. Oishi**, M. Mac Low, and D. C. Collins. Self-generated Three Dimensional Turbulence in Magnetic Reconnection Layers Sharply Increases Reconnection Rates. In *American Astronomical Society Meeting Abstracts #223*, volume 223 of *American Astronomical Society Meeting Abstracts*, page #118.05, January 2014.

D. Lecoanet, E. Quataert, G. M. Vasil, B. P. Brown, and **J. Oishi**. Simulations of Convective Excitation of Internal Waves in Water. *AGU Fall Meeting Abstracts*, page A3790, December 2014.

2013 **J. S. Oishi** and P. Chang. Methods for Simulating the Heavy Core Instability. In *European Physical Journal Web of Conferences*, volume 46 of *European Physical Journal Web of Conferences*, page 6001, April 2013.

2012 M. J. Turk, **J. S. Oishi**, T. Abel, and G. L. Bryan. Magnetic fields and angular momentum in population III star formation. In M. Umemura and K. Omukai, editors, *American Institute of Physics Conference Series*, volume 1480 of *American Institute of Physics Conference Series*, pages 77–80, September 2012.

J. S. Oishi, M. J. Turk, T. Abel, and G. Bryan. Turbulence and small scale dynamo action in population III star formation. In M. Umemura and K. Omukai, editors, *American Institute of Physics Conference Series*, volume 1480 of *American Institute of Physics Conference Series*, pages 87–90, September 2012.

A. Hubbard, C. McNally, M.-M. Mac Low, D. S. Ebel, **J. Oishi**, and J. Maron. Short Circuits in Magnetic Reconnection: A Route to Chondrule Formation. *Meteoritics and Planetary Science Supplement*, 75:5395, September 2012.

D. S. Ebel, A. Hubbard, C. McNally, M.-M. Mac Low, **J. Oishi**, and J. Maron. Chondrule Formation, Complementarity, and Pervasive, Highly Local Heating by Current Sheets. *Meteoritics and Planetary Science Supplement*, 75:5387, September 2012.

O. De Marco, J.-C. Passy, F. Herwig, C. L. Fryer, M.-M. Mac Low, and **J. S. Oishi**. How Common Envelope Interactions Change the Lives of Stars and Planets. In M. T. Richards and I. Hubeny, editors, *IAU Symposium*, volume 282 of *IAU Symposium*, pages 517–520, April 2012.

2011 J.-C. Passy, C. L. Fryer, S. Diehl, O. De Marco, M. Mac Low, F. Herwig, and **J. S. Oishi**. Comparisons Between SPH and Grid-Based Simulations of the Common Envelope Phase. In *American Astronomical Society Meeting Abstracts #217*, volume 43 of *Bulletin of the American Astronomical Society*, page #144.18, January 2011.

J.-C. Passy, O. De Marco, C. L. Fryer, F. Herwig, S. Diehl, **J. S. Oishi**, M.-M. Mac Low, G. L. Bryan, and G. Rockefeller. Simulations of the Common Envelope Interaction Between a Red Giant Branch Star and Low-Mass Companions. In L. Schmidtobreick, M. R. Schreiber, and C. Tappert, editors, *Evolution of Compact Binaries*, volume 447 of *Astronomical Society of the Pacific Conference Series*, page 107, September 2011.

J. S. Oishi and M.-M. Mac Low. Magnetic Helicity and Astrophysical Disk Dynamos. In V. Florinski, J. Heerikhuisen, G. P. Zank, and D. L. Gallagher, editors, *American Institute of Physics Conference Series*, volume 1366 of *American Institute of Physics Conference Series*, pages 122–128, September 2011.

T. Abel, M. Turk, J. Wise, **J. Oishi**, J. Kim, P. Wang, and M. Alvarez. The first stars and black holes. In *Galaxy Formation*, page 89, July 2011.

2010 M. J. Turk, B. D. Smith, **J. S. Oishi**, S. Skory, S. W. Skillman, T. Abel, and M. L. Norman. yt: A Multi-Code Analysis Toolkit for Astrophysical Simulation Data. Astrophysics Source Code Library, November 2010.

J. S. Oishi, C. McKee, and R. Klein. Numerical Methods for Radiative Feedback from the First Stars: Ionization in Adaptive Mesh Refinement Simulations. In D. J. Whalen, V. Bromm, and N. Yoshida, editors, *American Institute of Physics Conference Series*, volume 1294 of *American Institute of Physics Conference Series*, pages 270–271, November 2010.

2009 R. Chornock, J. S. Bloom, S. B. Cenko, J. M. Silverman, A. V. Filippenko, M. D. Hicks, K. J. Lawrence, P. Chang, J. M. Comerford, M. R. George, M. Modjaz, **J. S. Oishi**, E. Quataert, and L. E. Strubbe. SDSS J1536+0441: An Extreme "Double-peaked Emitter," Not a Binary Black Hole. *The Astronomer's Telegram*, 1955:1, March 2009.

2006 **J. S. Oishi**, M. Mac Low, and K. Menou. Turbulent Torques on Protoplanets in a Dead Zone. In *American Astronomical Society Meeting Abstracts*, volume 38 of *Bulletin of the American Astronomical Society*, page #179.03, December 2006.

2005 **J. S. Oishi**, M.-M. Mac Low, and K. Menou. Protoplanetary Migration in Layered, Magnetized Disks: First Results. In *Protostars and Planets V Posters*, page 8439, 2005.

2004 **J. S. Oishi** and M.-M. Mac Low. The Inability of Ambipolar Diffusion to Set the Inner Scale of Density and Energy in Molecular Clouds. In *American Astronomical Society Meeting Abstracts*, volume 36 of *Bulletin of the American Astronomical Society*, page 1439, December 2004.

R. Munoz, J. Carlin, M. Chatzikos, A. Hayes, S. Kanneganti, R. Mellon, **J. Oishi**, C. Park, A. Singhal, G. Sivakoff, S. R. Majewski, M. F. Skrutskie, and S. Sohn. Tracing Galactic Metallicity Gradients With the 2MASS Point Source Catalog. In D. Clemens, R. Shah, and T. Brainerd, editors, *Milky Way Surveys: The Structure and Evolution of our Galaxy*, volume 317 of *Astronomical Society of the Pacific Conference Series*, page 283, December 2004.

M.-M. Mac Low, J. Toraskar, **J. S. Oishi**, and T. Abel. Ultracompact H II Regions Formed by Gravitational Collapse in Expanding Shells of Larger H II Regions. In *American Astronomical Society Meeting Abstracts*, volume 36 of *Bulletin of the American Astronomical Society*, page 139.08, December 2004.