

# Curriculum Vitae

## Dr. Mark G. Jackson

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Place of birth: Portland, Oregon, USA

### Current Employment

2012 - present: Visiting Scientist *Institut D'Astrophysique de Paris,  
University of Illinois at Urbana-Champaign,*

2011 - present: Postdoctoral Researcher *Laboratoire AstroParticule et Cosmologie,  
Paris Centre for Cosmological Physics, France*

### Employment History

2008 - 2011: Postdoctoral Researcher *Lorentz Institute for Theoretical Physics,  
University of Leiden, The Netherlands*

2004 - 2008: Postdoctoral Researcher *Particle Astrophysics Center and Theory Group,  
Fermi National Accelerator Laboratory, Illinois*

### Education

1999 - 2004: M.S. and Ph.D., Theoretical Physics *Columbia University, New York*  
Doctoral Thesis Title: "Brane Gas Cosmology in Superstring Theory"  
Supervisor: Brian R. Greene

1995 - 1999: B.S. with Honors, Physics and Math Majors *Duke University, North Carolina*  
Senior Thesis Title: "Two Black Hole Holography, Lensing and Intensity"  
Supervisor: M. Ronen Plesser

## Academic Achievements and Awards

2011:	PCCP Postdoctoral Fellowship	<i>Paris Centre for Cosmological Physics</i>
2005 & 2007:	Honorable Mention, Essay Competition	<i>Gravitational Research Foundation</i>
2003:	KITP Graduate Fellow Award	<i>UC-Santa Barbara</i>
2002:	J. Selvaggi Award	<i>Columbia University</i>
2001 & 2002:	Pfister Fellowship	<i>Columbia University</i>
1998:	National Undergraduate Fellowship	<i>Princeton University</i>
1996 & 1997:	Summer Undergraduate Research Fellowship	<i>California Institute of Technology</i>

## Professional Experience

2013:	PRISM White Paper Contributor	
2013:	Organizing Committee, <i>PCCP Initial Conditions of Inflation Workshop</i>	
2013:	Organizing Committee, <i>PCCP Dark Energy Phenomenology Workshop</i>	
2012:	Organizing Committee, <i>Lorentz Center Effective Field Theory in Inflation Workshop</i>	
2012:	Organizing Committee, <i>PCCP Tests and Theories of Lorentz Symmetry Violations in Cosmology Workshop</i>	
2011–present:	Participant, NASA Inflation Probe Science Analysis Group (IPSAG)	
2011–present:	Journal Club Co-Organizer, APC	
2008–2011:	Seminar Organizer for Theoretical Cosmology in the Netherlands	
2008:	Organizing Committee, <i>CMB Polarization: Theory and Foregrounds NASA/Fermilab Workshop</i>	
2007:	Organizing Committee, <i>The Hunt for Dark Matter Symposium</i>	
2004–present:	Referee, Journal of Cosmology and Astroparticle Physics and Physical Review	
1998:	Editor-in-chief, Duke University Journal of Science and Technology	

## Teaching Experience

2009 & 2010:	Lecturer on Superstring Cosmology (18 hours), Solvay Institute Amsterdam-Brussels-Paris Doctoral School	
2004–7:	Cosmology Course Instructor, Fermilab Saturday Morning Physics Classes	
2004–5:	Project Mentor, Illinois Math and Science Academy	
2000–2004:	Teaching assistant for courses in <i>Modern Geometry</i> and <i>Topics in Particle Cosmology</i> (with Brian Greene) and <i>Quantum Mechanics</i> (with Dan Kabat)	
2000–2002:	VIGRE Summer Instructor, supervised advanced physics projects for 12 undergraduates (resulting in publication in JHEP)	
1999 & 2000:	Laboratory Instructor, Department of Physics, Columbia University	
1999–2004:	Extensive tutoring in undergraduate and high school physics	

## References

Brian R. Greene  
Department of Physics  
Columbia University  
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## Students Supervised

- Janos Perczel - Undergraduate student, University of St. Andrews (2010)
- Ben Geller - Undergraduate student, Swarthmore College (2003)
- Laura Pomerance - Undergraduate student, Swarthmore College (2003)
- David Anderson - Undergraduate student, Columbia College (2002, 2003)
- Scott Meltzer - Undergraduate student, Columbia College (2002)
- John Conley - Undergraduate student, Columbia College (2002, 2003)

## Seminars and Colloquia

(\* Denotes Invited Talk to International Conference)

- **“Effective Field Theory in Inflation”**

- \*International Workshop for String Theory and Cosmology, Seoul (6/13)
- University of Chicago Theory/KICP Seminar (5/13)
- UC-Irvine Theory Seminar (5/13)
- University of Utrecht D-ITP Theory Seminar (4/13)
- Hong Kong University of Science and Technology-IAS Seminar (2/12)
- Catholic University of Louvain Theory Seminar (1/12)
- University of Bilbao Cosmology Seminar (12/12)
- MIT/Tufts Cosmology Seminar (11/12)
- Caltech Cosmology Seminar (11/12)
- \*Critical Tests of Inflation Using Non-Gaussianity Workshop (11/12)
- University of Paris - Orsay Theory Seminar (10/12)
- University of Geneva Theory Seminar (10/12)
- \*Effective Field Theory in Inflation Lorentz Center Workshop (7/12)
- Niels Bohr Institute Theory Seminar, University of Copenhagen (5/12)
- CP3 Theory Seminar, University of Southern Denmark (5/12)
- Ortvay Seminar at the Eötvös University, Budapest (4/12)
- University of Budapest Theoretical High Energy Seminar (4/12)
- Bethe Centre for Theoretical Physics in Bonn Seminar (4/12)
- University of Nottingham Particle Theory and Quantum Gravity Seminar (2/12)
- \*Aspen Winter Conference, Inflationary Theory and Data in the Planck Era (1/12)
- Columbia University Theory Seminar (12/11)
- Cornell University Theory Seminar (12/11)
- CERN Cosmo Coffee (11/11)
- PASCOS 2011 Parallel Session Seminar (7/11)
- Fermilab Theory Blackboard Seminar (6/11)
- Perimeter Institute Cosmology Seminar (5/11)
- Arizona State University Theory Seminar (5/11)
- Stanford University Theory Seminar (5/11)
- Observatory of Paris - Meudon (3/11)
- University of Chile - Calán Astronomy Seminar (1/11)
- Pontificia Universidad Católica de Santiago, Chile Cosmology Seminar (1/11)
- Princeton University Gravity and Cosmology Seminar (12/10)
- \*University of Groningen String Meeting Seminar (11/10)
- University of Paris - École Normale Supérieure Seminar (10/10)
- University of Paris - AstroParticule et Cosmologie Seminar (10/10)
- University of Paris - Institut d'Astrophysique Seminar (10/10)
- \*IPMU, Tokyo String Cosmology Focus Week Seminar (10/10)
- University of Valencia Theory Seminar (9/10)

- **“CMB Polarization and Inflationary Theory”**

Beyond CORE Workshop, Paris (6/12)

PASCOS 2009 Parallel Session Seminar (7/09)

11th Annual Dutch National Astroparticle Physics Symposium (3/09)

- **“Observing New Physics in the Sky”**

Granada Workshop on Physics at the TeV Scale Seminar (5/10)

Netherlands High Energy Theory National Seminar (3/10)

University of Utrecht Spinoza Institute for Theory Seminar (3/10)

University of Leiden Theoretical Cosmology Seminar (3/10)

University of Pennsylvania Cosmology Seminar (5/09)

University of Texas at Austin Cosmology Seminar (4/09)

Duke University Center for Geometry and Theoretical Physics Seminar (4/09)

King’s College London Theory Seminar (2/09)

Imperial College Cosmology Seminar (1/09)

- **Colloquium : “The State of String Theory”**

University of Groningen (12/10)

University of Texas at Dallas (4/09)

University of Wisconsin - Milwaukee (11/07)

- **“Detecting Cosmic Superstrings”**

Cosmic String Mini-Workshop, King’s College London (3/11)

KITP-University of California, Santa Barbara Theory Seminar (5/08)

The Great Lakes ’08 Strings Conference (4/08)

Argonne National Laboratory Theory Seminar (2/08)

\*Paris APC Strings and Superstrings in Observational Cosmology Workshop (12/07)

Stanford Linear Accelerator Theory Seminar (12/07)

\*ICTP String Cosmology Workshop (7/07)

University of Chicago KICP Cosmology Seminar (1/06)

University of Cambridge DAMTP Seminar (9/05)

University of Amsterdam Theory Seminar (9/05)

COSMO ’05 Parallel Session Seminar (8/05)

Rutgers University Theory Seminar (5/05)

Yale University Particle Theory Seminar (4/05)

\*Perimeter Institute Workshop on String Phenomenology (3/05)

University of Michigan - Ann Arbor Theory Seminar (3/05)

Harvard University Theory/Duality Seminar (2/05)

University of Washington - Seattle Theory Seminar (2/05)

University of California - Davis Cosmology Seminar (1/05)

University of Wisconsin - Madison Theory/Astro Seminar (11/04)

- **“Brane Gas Cosmology”**

\*Banff International Research Station String Cosmology Workshop (6/04)

University of Pennsylvania Theory Seminar (2/04)

Stanford University Center for Theoretical Physics Seminar (1/04)

Fermi National Accelerator Laboratory Astrophysics Seminar (1/04)

TASI Student Seminar (6/03)

Columbia University ISCAP Seminar (4/02)

- **“Two Black Hole Lensing, Holography, and Intensity”**

American Physical Society Centennial Meeting (3/99)

- **“Centrifugally Confined Plasmas”**

American Physical Society Plasma Physics Division Meeting (11/98)

## Public Education and Outreach

- Science Slam Presentation, *International Council for Science*, October 2013
- PCCP “Teaching the Universe” Paris Teachers’ Workshop (11/11, 11/12)
- Einstein’s Birthday Party Lecture, Leiden High School (3/11)
- Zzondag Art and Science Symposium, Villa Ockenburg Artist Community (2/10)
- Public Physics Lectures at: Fermilab’s Ask-a-Scientist (2006, 2008); University of Illinois at Chicago (4/07); McHenry High School (4/07); University of Central Missouri (10/06); Illinois Science Council (9/06); Art Institute of Chicago (4/06); Manhattanville College (4/04); NY Amateur Physics Society (4/04)

## Press and Media Coverage

- Cara Santa Maria, “WTF is String Theory?,” *Talk Nerdy To Me* Huffington Post Video Blog, December 18, 2012
- Megan Baker, Michell Eloy, and Shane Michael Singh, *Chicago Magazine*, July 2011
- Ron Cowen, “Hogan’s Noise,” *ScienceNews* Vol. 177, March 13th, 2010, p. 26.
- Catalina Curceanu, Interview for INFN “Scientists of the World” Profiles, <http://www.lnf.infn.it/sis/edu/stagelnf/2009/interviste09/>, July 2009.
- Eric Hand, “Collision Course,” *Nature* **455**, September 10, 2008, p. 258-259
- Tona Kunz, *Fermilab Today*, July 9, 2008; *Symmetry Breaking*, July 9, 2008
- Jennifer Wehunt, *Chicago Magazine*, July 2008, p. 74
- Tona Kunz, “Theorists Look to Test Ideas with Space Data,” *Fermilab Today*, June 25, 2008
- Dave Mosher, MSNBC.com / LiveScience Greatest Mysteries Series, “What Causes Gravity?,” August 10, 2007, and “Is There a Theory of Everything?,” August 21, 2007
- Christopher Jargocki, Interview for The Center for Cooperative Phenomena, <http://c4cp.org/>, November 2006
- Siri Steiner, “Evidence of String Theory Written Across the Sky?,” *Fermilab Today*, August 28, 2006
- Steve Nadis, “The Return of Cosmic Strings,” *Astronomy*, October 2005, p. 46

## Publications (*h*-index 13)

1. M. G. Jackson and K. Schalm, “Renormalization of Inflationary Models,” in preparation
2. M. G. Jackson, B. Wandelt, “Diffusive Inflation,” in preparation.
3. M. G. Jackson, B. Wandelt, “Angular Correlation Functions for Models with Linear Oscillations,” in preparation.
4. P. Andre *et al.* [PRISM Collaboration], “PRISM (Polarized Radiation Imaging and Spectroscopy Mission): A White Paper on the Ultimate Polarimetric Spectro-Imaging of the Microwave and Far-Infrared Sky,” arXiv:1306.2259 [astro-ph.CO].
5. M. G. Jackson and G. Shiu, “A Consistency Relation for Single-Field Inflation with Power Spectrum Oscillations,” submitted to Phys. Rev. Lett., arXiv:1303.4973 [hep-th].
6. M. G. Jackson, B. Wandelt and F. Bouchet, “Angular Correlation Functions for Models with Logarithmic Oscillations,” arXiv:1303.3499 [hep-th].
7. M. G. Jackson, “Integrating out Heavy Fields in Inflation,” submitted to Physical Review Letters, arXiv:1203.3895 [hep-th].
8. M. G. Jackson and K. Schalm, “Model Independent Signatures of New Physics in Non-Gaussianity,” submitted to Physical Review D, arXiv:1202.0604 [hep-th]. (6 citations)
9. M. G. Jackson and K. Schalm, “Model Independent Signatures of New Physics in Slow-Roll Inflation,” submitted to Physical Review D, arXiv:1104.0887 [hep-th]. (15 citations)
10. M. G. Jackson and K. Schalm, “Model Independent Signatures of New Physics in the Inflationary Power Spectrum,” Phys. Rev. Lett. (Editors’ Suggestion) **108**, 111301 (2012), arXiv:1007.0185 [hep-th]. (20 citations)
11. M. G. Jackson, “Solvay Lectures on Superstring Cosmology,” Lecture Notes for Solvay Amsterdam-Brussels-Paris Ph.D. School
12. P. Daniel Meerburg, J. P. van der Schaar, M. G. Jackson, “Bispectrum signatures of a modified vacuum in single field inflation with a small speed of sound,” JCAP **1002**, 001 (2010) [arXiv:0910.4986 [hep-th]] (33 citations)
13. E. Sefusatti, M. Liguori, A. Yadav, M. G. Jackson, E. Pajer, “Constraining Running Non-Gaussianity,” JCAP **0912**, 022 (2009) [arXiv:0906.0232 [astro-ph.CO]]. (70 citations)



14. S. Meyer, S. Hanany, *et al.*, “A Program of Technology Development and of Sub-Orbital Observations of the Cosmic Microwave Background Polarization Leading to and Including a Satellite Mission”
15. J. Aguirre *et al.*, “Observing the Evolution of the Universe,” Science White Paper submitted to the US Astro2010 Decadal Survey, arXiv:0903.0902 [astro-ph.CO].
16. E. Komatsu *et al.*, “Non-Gaussianity as a Probe of the Physics of the Primordial Universe and the Astrophysics of the Low Redshift Universe,” Cosmology and Fundamental Physics (CFP) Science Frontier Panel of the Astro 2010 , arXiv:0902.4759 [astro-ph.CO].
17. S. Dodelson *et al.*, “The Origin of the Universe as Revealed Through the Polarization of the Cosmic Microwave Background,” Science White Paper submitted to the US Astro2010 Decadal Survey, arXiv:0902.3796 [astro-ph.CO].
18. M. G. Jackson and X. Siemens, “Gravitational Wave Bursts from Cosmic Superstring Reconnections,” JHEP **0909**, 089 (2009), [arXiv:0901.0867 [hep-th]]. (11 citations)
19. C. J. Hogan and M. G. Jackson, “Holographic Geometry and Noise in Matrix Theory,” Phys. Rev. D **79**, 124009 (2009) [arXiv:0812.1285 [hep-th]]. (2 citations)
20. D. Baumann, M. G. Jackson *et al.*, “CMBPol Mission Concept Study: Probing Inflation with CMB Polarization,” AIP Conf. Proc. 1141: 10-120, 2009, arXiv:0811.3919 [astro-ph]. (193 citations)
21. D. Baumann, M. G. Jackson *et al.*, “CMBPol Mission Concept Study: A Mission to Map our Origins,” AIP Conf. Proc. 1141: 3-9, 2009, arXiv:0811.3911 [astro-ph]. (23 citations)
22. M. G. Jackson, “Spin-Statistics Violations from String Theory,” Phys. Rev. D **78**, 126009 (2008) [arXiv:0809.2733 [hep-th]]. (2 citation)
23. M. G. Jackson, “Spin-Statistics Violations from Heterotic String Worldsheet Instantons,” Phys. Rev. D **77**, 127901 (2008), arXiv:0803.4472 [hep-th]. (3 citations)
24. M. G. Jackson, “Interactions of Cosmic Superstrings,” JHEP **0709**, 35 (2007) [arXiv:0706.1264]. (12 citations)
25. M. G. Jackson and C. J. Hogan, “A New Spin on Quantum Gravity,” Int. J. Mod. Phys. D **17**, 567 (2008) [arXiv:hep-th/0703133]. (5 citations)
26. M. G. Jackson, “A note on cosmic  $(p, q, r)$  strings,” Phys. Rev. D **75**, 087301 (2007) [arXiv:hep-th/0610059]. (3 citations)
27. M. G. Jackson, “Cosmic Superstring Scattering in Backgrounds,” JHEP **0609**, 071 (2006) [arXiv:hep-th/0608152]. (5 citations)

28. M. G. Jackson, "Gravity from a modified commutator," *Int. J. Mod. Phys. D* **14**, 2239 (2005) [arXiv:hep-th/0505096]. (4 citations)
29. R. Easther, B. R. Greene, M. G. Jackson and D. Kabat, "String windings in the early universe," *JCAP* **0502**, 009 (2005) [arXiv:hep-th/0409121]. (76 citations)
30. M. G. Jackson, N. T. Jones and J. Polchinski, "Collisions of cosmic F- and D-strings," *JHEP* **0510**, 013 (2005) [arXiv:hep-th/0405229]. (175 citations)
31. R. Easther, B. R. Greene, M. G. Jackson and D. Kabat, "Brane gases in the early universe: Thermodynamics and cosmology," *JCAP* **0401**, 006 (2004) [arXiv:hep-th/0307233]. (51 citations)
32. R. Easther, B. R. Greene, M. G. Jackson and D. Kabat, "Brane gas cosmology in M-theory: Late time behavior," *Phys. Rev. D* **67**, 123501 (2003) [arXiv:hep-th/0211124]. (66 citations)
33. J. Conley, B. Geller, M. G. Jackson, L. Pomerance and S. Shrivastava, "A quantum mechanical model of spherical supermembranes," *JHEP* **0301**, 070 (2003) [arXiv:hep-th/0210049]. (2 citations)
34. R. Easther, B. R. Greene and M. G. Jackson, "Cosmological string gas on orbifolds," *Phys. Rev. D* **66**, 023502 (2002) [arXiv:hep-th/0204099]. (70 citations)
35. M. G. Jackson, "The stability of noncommutative scalar solitons," *JHEP* **0109**, 004 (2001) [arXiv:hep-th/0103217]. (21 citations)
36. M. G. Jackson, "Two black hole holography, lensing and intensity," *Phys. Rev. D* **64**, 044020 (2001) [arXiv:gr-qc/0103078]. (1 citation)
37. M. G. Jackson, B. R. Osborn, R. F. Ellis, and A. B. Hassam, "Centrifugally Confined Plasmas: Enhanced Stability Scenarios," *Current Trends in International Fusion Research - Proceedings of the Second Symposium*, p. 455-61 (1998).