Tristan L. Smith

College Address

Physics and Astronomy Department
Swarthmore College
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Biographical Information

Born March 3 1981, New York City, USA
Citizenship: USA
Country of permanent residence: USA

Research Interests

Early Universe cosmology, inflation, dark energy, growth of large-scale structure, alternative theories of gravity

Current Position

Aug 2013 – present Visiting Assistant Professor of Physics, Swarthmore College

Previous Positions

Sept 2008 – Aug 2013 BCCP Postdoctoral Fellow

June 2012 – Aug 2013 Adjunct Professor in the physics department, UC Berkeley

May 2008 – Sept 2008 Postdoctoral scholar, California Institute of Technology

Sept 2008 – Sept 2010 Visiting scholar, California Institute of Technology

Sept 2011 – Feb 2012 Visiting scholar, the Institute for the Physics and Mathematics of the Universe (IPMU), University of Tokyo

Education

Sept 2003 – May 2008 California Institute of Technology, Pasadena, CA

- *Ph.D., Theoretical Physics.*
- *GPA: 3.8*
- *PhD Advisor: Professor Marc Kamionkowski,*
- *Thesis titled "The gravity of the situation: probing the fundamental nature of cosmology through gravity and the fundamental nature of gravity through cosmology"*

Sept 1999 – June 2003 University of Chicago, Chicago, IL

- *B. A., with General Honors, Physics with a Specialization in Astrophysics with Honors.*
- *GPA: 3.86*
- *Senior Thesis Advisor: Professor Donald G. York*
- *Thesis titled "Damped Lyman Alpha systems in the SDSS absorption line system catalog"*

Sept 1995 – June 1999 The Bronx High School of Science, Bronx, NY
- *Regents High School Diploma with Honors.*
- *GPA: 96.8 (100 point scale)*

Teaching and Advising Experience

2006 – 2007 Teaching Assistant, Ph236abc, General Relativity, California Institute of Technology

2008 – 2009 Research advisor for Anna Rosen (undergraduate at UC Berkeley, now at UC Santa Cruz)
- *Research project titled: Gravitational lensing in alternative gravity theories*

2008 – 2009 Research advisor for Noel Swanson (undergraduate at Harvard University, now at Princeton)
- *Research project titled: Deflection of light by gravitational waves and its role in pulsar timing*

2008 – present Volunteer at San Francisco's Exploratorium
- *Explained various exhibits to visitors; guided tours at special events*

Dec 2008 City College of San Francisco, Physics Club talk
- *Talk titled "The Gravity of the Situation"*

July 2009 Santa Fe Cosmology Summer Workshop
- *Invited review of dark energy and modified gravity*

July 2010 BCCP Global Teacher's Academy Workshop, lecturer
- *The special and general theories of relativity: the gravity of the situation*

Summer 2012 Instructor for Physics 7C (third semester introductory physics covering special relativity, optics, and quantum mechanics), UC Berkeley; rated 6.2 out of 7 (Summer session 7C departmental avg.: 5.7)

Fall 2012 Instructor for Physics H7C (honors track third semester introductory physics covering special relativity, optics, and quantum mechanics), UC Berkeley; students rated 5.7 out of 7 (H7C departmental avg.: 5.5)

2012 – 2013 Research advisor for Michela Paganini (undergraduate at UC Berkeley)

Awards and Honors

2003 – 2006	NSF Graduate Research Fellowship
2003	Sigma Xi nomination
2003	Inducted into Phi Beta Kappa, University of Chicago Chapter
2003	Class Marshal, University of Chicago (one of 40 elected by faculty for academic achievement)
1999 – 2003	Dean's List, University of Chicago

Affiliations

2003 – present	Member, Sigma Xi
2003 – present	Member, Phi Beta Kappa
2002 – present	Member, American Astronomical Society

2012 – present Member, American Association of Physics Teachers

Professional Service

Referee for: The Physical Review D, The Physical Review Letters, Journal of Cosmology and Astroparticle Physics, Physics Letters B

Conferences, Summer Schools, and Workshops

June – Aug 2002 Harvard Smithsonian Astrophysical Observatory REU
- *Mentored by Suzanne Romaine*
- *Research project title: "Beyond Chandra and XMM-Newton: the next generation X-ray observatories"*

October 2003 Theoretical Astrophysics in Southern California (TASC) workshop, UC Irvine

August 2004 XXXII Slac Summer Institute: Nature's Greatest Puzzles

Oct 2004 Theoretical Astrophysics in Southern California (TASC) workshop, Caltech
- *Talk titled "The inflationary gravitational wave background and gravitational-wave observatories"*

Aug 2005 XXXIII Slac Summer Institute: Gravity in the Quantum World and the Cosmos

Oct 2005 Theoretical Astrophysics in Southern California (TASC) workshop, Caltech
- *Talk titled "A new CMB constraint to gravitational-wave backgrounds"*

Dec 2005 New Views of the Universe: Inaugural symposium for the Kavli Institute for Theoretical Cosmology at the University of Chicago
- *Poster titled "Direct detection of the inflationary gravitational wave background"*

March 2006 UC Irvine Workshop on Fundamental Physics with Cosmic Microwave Background Radiation
- *Poster titled "Deciphering Inflation with Gravitational Waves: CMB Polarization vs. Direct Detection with Laser Interferometers"*

July – Aug 2006 Les Houches Summer School Session 86, Particle Physics and Cosmology: the Fabric of Spacetime
- *Talk titled "A new CMB constraint to gravitational-wave backgrounds"*

May 2007 Origins of Dark Energy Conference and Workshop, Hamilton University and the Perimeter Institute
- *Poster titled "Solar System constraints to general f(R) gravity"*

July 2007 SF07 Cosmology Summer Workshop, St. John's College, Santa Fe NM

Feb 2008 Aspen Center for Physics, CMB workshop
- *Talk titled "From the CMB to inflation: implications for the inflationary gravitational wave background"*

June 2009 Aspen Center for Physics summer workshop "*Testing general relativity in the cosmos"*
- *Invited review of dark energy and modified gravity*

Feb 2010 UC Davis Cosmology Seminar
- *New tests of gravity on astrophysical scales*

Sept 2011	IPMU, Univ. of Tokyo Cosmology Seminar ❖ *Beyond the standard cosmological model: neutrinos and non-Gaussianity*
Nov 2011	University of Nagoya Cosmology Seminar ❖ *Beyond the standard cosmological model: neutrinos and non-Gaussianity*
Feb 2012	CCSF seminar series ❖ *Neutrinos in Cosmology*
Oct 2013	University of San Francisco seminar series ❖ *Cosmology after the Planck Satellite*

Research Publications

1. "An improved estimator for non-Gaussianity in cosmic microwave background observations", Tristan L. Smith, Daniel Grin, and Marc Kamionkowski, *Physical Review D*, **87**, 063003 (2013)

2. "Model Independent Early Expansion History and Dark Energy", Johan Samsing, Eric Linder, and Tristan L. Smith, *Physical Review D*, **86**, 123504 (2012)

3. "The probability distribution for non-Gaussian estimators constructed from the CMB trispectrum", Tristan L. Smith and Marc Kamionkowski, *Physical Review D*, **86**, 063009 (2012)

4. "Improved limits on short-wavelength gravitational waves from the cosmic microwave background", Irene Sendra and Tristan L. Smith, *Physical Review D*, **85**, 123002 (2012)

5. "Constraints on neutrino and dark radiation interactions using cosmological observations", Tristan L. Smith, Sudeep Das, and Oliver Zahn, *Physical Review D*, **85**, 023001 (2012)

6. "The probability distribution for non-Gaussian estimators", Tristan L. Smith, Marc Kamionkowski, and Benjamin Wandelt, *Physical Review D*, **84**, 063013 (2011)

7. "The CMB Bispectrum, Trispectrum, non-Gaussianity, and the Cramer-Rao Bound", Marc Kamionkowski, Tristan L. Smith, and Alan Heavens, *Physical Review D*, **83**, 023007 (2011)

8. "Dark Before Light: Testing the Cosmic Expansion History through the Cosmic Microwave Background", Eric V. Linder and Tristan L. Smith, JCAP, **1104**, 001 (2011)

9. "Testing General Relativity with Current Cosmological Data", Scott F. Daniel, Eric V. Linder, Tristan L. Smith et al., *Physical Review D*, **81**, 123508 (2010)

10. "CMB Isotropy Anomalies and the Local Kinetic Sunyaev-Zel'dovich Effect", Hiranya V. Peiris and Tristan L. Smith, *Physical Review D*, **81**, 12357 (2010)

11. "Testing gravity on kiloparsec scales with strong gravitational lenses", Tristan L. Smith, arXiv:0907.4829

12. "The inflationary gravitational-wave background and measurements of the scalar spectral index", Tristan L. Smith, Marc Kamionkowski, Asantha Cooray, *Physical Review D*, **78**, 083525 (2008)

13. "Axion constraints in non-standard thermal histories", Daniel Grin, Tristan L. Smith, Marc Kamionkowski, *Physical Review D*, **77**, 085020 (2008)

14. "The effects of Chern-Simons gravity on bodies orbiting the Earth", Tristan L. Smith, Adrienne L. Erickcek, Robert R. Caldwell, Marc Kamionkowski, *Physical Review D*, **77**, 024015 (2008)

15. “Solar System constraints to general f(R) gravity”, Takeshi Chiba, Tristan L. Smith, Adrienne L. Erickcek, *Physical Review D*, **75**, 124014 (2007)

16. “Solar System tests DO rule out 1/R gravity”, Adrienne L. Erickcek, Tristan L. Smith, Marc Kamionkowski, *Physical Review D*, **74,** 121501 (2006)

17. “Non-Gaussian Covariance of CMB B-modes of Polarization and Parameter Degradation”, Chao Li, Tristan L. Smith, Asantha Cooray, *Physical Review D*, **75**, 083501 (2007)

18. “A new cosmic microwave background constraint to primordial gravitational waves”, Tristan L. Smith, Elena Pierpaoli, Marc Kamionkowski, *Physical Review Letters*, **97**, 021301 (2006)

19. “Deciphering inflation with gravitational-waves: cosmic microwave background polarization vs. direct detection with laser interferometers”, Tristan L. Smith, Hiranya V. Peiris, Asantha Cooray, *Physical Review D*, **73**, 123503 (2006)

20. “Average Extinction Curves and Relative Abundances for QSO Absorption Line Systems at 1 <= z_abs < 2”, Donald G. York et al., *MNRAS*, **367**, 945-978 (2006)

21. “Direct detection of the inflationary gravitational-wave background”, Tristan L. Smith, Marc Kamionkowski, Asantha Cooray, *Physical Review* D, **73**, 023504 (2006)