

Curriculum Vitae

Stephon Haigh-Solomon Alexander

Title:

Professor of Physics

Contact Information:

Department of Physics
Brown University

Providence, RI 02912

215-264-7096

1. Education

Ph.D. Physics, Brown University, Providence, RI, USA, 2000

Sc. M Electrical Engineering, Brown University, Providence, RI, USA, 1996

Sc. M Physics, Brown University, Providence, RI, USA, 1995

B.S. Physics, Haverford College, Haverford, PA, USA, 1993

Research Positions (postdocs)

Postdoctoral Researcher, 2002-2005
SLAC and Institute for Theoretical Physics
Stanford University, CA

Postdoctoral Researcher, 2000-2002
Imperial College, London, U.K

2. Professional Appointments

Ernest Everett 1907 Associate Professor of Natural Sciences 2012-Present
Associate Professor of Physics and Astronomy
Dartmouth College, NH

Associate Professor of Physics 2008-2012
Haverford College, PA

Assistant Professor of Physics 2005-2008
Penn State University, PA

Postdoctoral Researcher, 2002-2005
SLAC and Institute for Theoretical Physics
Stanford University, CA

Postdoctoral Researcher, 2000-2002
Imperial College, London, U.K

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3.

4. Parallel Visiting Appointments:

Visiting Professor of Physics Princeton University, NJ	2011-2012
Visiting Professor of Physics The California Institute of Technology, CA	Fall 2008
Visiting Scientist Perimeter Institute, Waterloo, Canada	2005-2007
Visiting Postdoctoral Researcher, ISCAP Institute, Columbia University, N.Y	2001-2002
Visiting Postdoctoral Researcher, Perimeter Institute, Waterloo, Canada	2000-2004

5. Completed Publications:

Dynamics of Gauge Field Inflation

By Stephon Alexander, Dhruvo Jyoti, Arthur Kosowsky, Antonino Marciano.

JCAP 1505 (2015) 05, 005.

Fermi-bounce cosmology and the fermion curvaton mechanism

By Stephon Alexander, Yi-Fu Cai, Antonino Marciano.

Phys.Lett. B745 (2015) 97-104.

Gravitational-Wave Mediated Preheating

By Stephon Alexander, Sam Cormack, Antonino Marcianò, Nicolás Yunes.

Phys.Lett. B743 (2015) 82-86.

Fermi-bounce Cosmology and scale invariant power-spectrum

By Stephon Alexander, Cosimo Bambi, Antonino Marciano, Leonardo Modesto.

Phys.Rev. D90 (2014) 12, 123510.

Gravitational origin of the weak interaction's chirality

By Stephon Alexander, Antonino Marciano, Lee Smolin.

Phys.Rev. D89 (2014) 6, 065017.

Electric Time in Quantum Cosmology

By Stephon Alexander, Martin Bojowald, Antonino Marciano, David Simpson.

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Class.Quant.Grav. 30 (2013) 155024.

Horava-Lifshitz theory as a Fermionic Aether in Ashtekar gravity

By Stephon Alexander, Joao Magueijo, Antonino Marciano.

Phys.Rev. D86 (2012) 064025.

The Hidden Quantum Groups Symmetry of Super-renormalizable Gravity

By Stephon Alexander, Antonino Marciano, Leonardo Modesto.

Phys.Rev. D85 (2012) 124030.

Chern-Simons Inflation and Baryogenesis

By Stephon Alexander, Antonino Marciano, David Spergel.

JCAP 1304 (2013) 046.

Towards a Loop Quantum Gravity and Yang-Mills Unification

By Stephon Alexander, Antonino Marciano, Ruggero Altair Tacchi.

Phys.Lett. B716 (2012) 330-333.

Testing gravitational parity violation with coincident gravitational waves and short gamma-ray bursts

By Nicolas Yunes, Richard O'Shaughnessy, Benjamin J. Owen, Stephon Alexander.

Phys.Rev. D82 (2010) 064017.

Chern-Simons Modified General Relativity

By Stephon Alexander, Nicolas Yunes.

Phys.Rept. 480 (2009) 1-55.

Cosmological Bardeen-Cooper-Schrieffer condensate as dark energy

By Stephon Alexander, Tirthabir Biswas, Gianluca Calcagni.

Phys.Rev. D81 (2010) 069902.

Cyclic Inflation

By Tirthabir Biswas, Stephon Alexander.

Phys.Rev. D80 (2009) 043511.

Magnetic Fields from Heterotic Cosmic Strings

By Rhiannon Gwyn, Stephon H. Alexander, Robert H. Brandenberger, Keshav Dasgupta

Phys.Rev. D79 (2009) 083502.

Generation of Circular Polarization of the Cosmic Microwave Background

By Stephon Alexander, Joseph Ochoa, Arthur Kosowsky.

Phys.Rev. D79 (2009) 063524.

The Cosmological BCS mechanism and the Big Bang Singularity

By Stephon Alexander, Tirthabir Biswas.

Phys.Rev. D80 (2009) 023501.

Quantum gravity as a Fermi liquid

By Stephon H.S. Alexander, Gianluca Calcagni.

Found.Phys. 38 (2008) 1148-1184.

Superconducting loop quantum gravity and the cosmological constant

By Stephon H.S. Alexander, Gianluca Calcagni.

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Phys.Lett. B672 (2009) 386-389.

Chern-Simons Modified Gravity as a Torsion Theory and its Interaction with Fermions
By Stephon Alexander, Nicolas Yunes.

Phys.Rev. D77 (2008) 124040.

A Gravitational-wave probe of effective quantum gravity

By Stephon Alexander, Lee Samuel Finn, Nicolas Yunes.

Phys.Rev. D78 (2008) 066005.

Local Void vs Dark Energy: Confrontation with WMAP and Type Ia Supernovae

By Stephon Alexander, Tirthabir Biswas, Alessio Notari, Deepak Vaid.

JCAP 0909 (2009) 025.

Isogravity: Toward an Electroweak and Gravitational Unification

By Stephon H.S. Alexander.

Under review by **Journal Universe**

Parametrized post-Newtonian expansion of Chern-Simons gravity

By Stephon Alexander, Nicolas Yunes.

Phys.Rev. D75 (2007) 124022.

A New PPN parameter to test Chern-Simons gravity

By Stephon Alexander, Nicolas Yunes.

Phys.Rev.Lett. 99 (2007) 241101.

Is cosmic parity violation responsible for the anomalies in the WMAP data?

By Stephon H.S. Alexander.

Phys.Lett. B660 (2008) 444-448.

A Quantum gravitational relaxation of the cosmological constant

By Stephon Alexander.

Phys.Lett. B629 (2005) 53-59.

Birefringent gravitational waves and the consistency check of inflation

By Stephon Alexander, Jerome Martin.

Phys.Rev. D71 (2005) 063526.

Can the string scale be related to the cosmic baryon asymmetry?

By Stephon H.S. Alexander, S.James Gates, Jr.

JCAP 0606 (2006) 018.

In the realm of the geometric transitions

By Stephon Alexander, Katrin Becker, Melanie Becker, Keshav Dasgupta, Anke Knauf, Radu Tatar.

Nucl.Phys. B704 (2005) 231-278.

Leptogenesis from gravity waves in models of inflation

By Stephon Haigh-Solomon Alexander, Michael E. Peskin, Mohammad M. Sheikh-Jabbari.

Phys.Rev.Lett. 96 (2006) 081301.

Quantum gravity and inflation

By Stephon Alexander, Justin Malecki, Lee Smolin.

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Stephon Haigh-Solomon Alexander

Phys.Rev. D70 (2004) 044025.

Brane gas cosmology, M theory and little string theory

By Stephon H.S. Alexander.

hep-th/0212151.

JHEP 0310 (2003) 013.

Quintessence and variation of the fine structure constant in the CMBR

By Greg Huey, Stephon Alexander, Levon Pogosian.

Phys.Rev. D65 (2002) 083001.

Noncommutative inflation

By Stephon Alexander, Robert Brandenberger, Joao Magueijo.

Phys.Rev. D67 (2003) 081301.

A Thermal instability for positive brane cosmological constant in the Randall-Sundrum cosmologies

By Stephon Alexander, Yi Ling, Lee Smolin.

Phys.Rev. D65 (2002) 083503.

Inflation from D - anti-D-brane annihilation

By Stephon H.S. Alexander.

Phys.Rev. D65 (2002) 023507.

Noncommutative geometry as a realization of varying speed of light cosmology

By Stephon Alexander, Joao Magueijo.

Proceedings of the XIIIrd Rencontres de Blois 'Frontiers of the Universe', pp281, The Gioi Publishers, 2004.

Brane gases in the early universe

By S. Alexander, Robert H. Brandenberger, D.A. Easson.

Phys.Rev. D62 (2000) 103509.

On the varying speed of light in a brane induced FRW universe

By Stephon H.S. Alexander.

JHEP 0011 (2000) 017.

Books & Monographs

Chern-Simons Modified General Relativity (Monograph)

Stephon Alexander, Nicolas Yunes.

Physics Reports 480 (2009) 1-55.

The Jazz of Physics (Book)

Published by **BASIC BOOKS**, a member of Perseus Book Group

In press, to be released Winter 2015

Book Reviews

Curriculum Vitae

Stephon Haigh-Solomon Alexander

Textbook: Primordial Cosmology, Physics Today, 2011

Textbook: Modern Physics by Tipler and Llewellyn, 2010

Conference Proceedings:

The Hubble Web: The Dark Matter Problem and Cosmic Strings

By Stephon Alexander.

AIP Conf.Proc. 1140 (2009) 46-53.

Gravi-Leptogenesis: Leptogenesis from Gravity Waves in Pseudo-scalar Driven Inflation Models

By Stephon Haigh-Solomon Alexander, Michael E. Peskin, Mohammad M. Sheikh-Jabbari.

eConf C0605151 (2006) 0022.

Chapters in Books

What's Next, Dispatches on the Future of Science (Vintage, 2009)

What Have You Changed Your Mind About? Edited by J. Brockman (Harper 2014)

What Should You Be Worried About? Edited by J. Brockman (Harper 2013)

Journal/Newspapers

New York Times, A Room for Debate, Feb 2013

Chronicles of Higher Education Invited Article, 2009

Work in Progress:

A deterministic resolution to the measurement problem in inflationary theory

Stephon Alexander, Dhruvo Jyoti

BCS Dark Matter

Stephon Alexander, Sam Cormack

The fine tuning problem and cyclic cosmology

Stephon Alexander, Sam Cormack, Marcello Geysler

The CMB power asymmetry, lensing and circular polarization

Stephon Alexander

6. Academic Awards:

American Physical Society (APS), Edward Boucher Award, 2013

Trinidad and Tobago Ministry of Science and Technology,

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Rudranath Capildeo National Medal for the Natural Sciences, 2012

Elected to the Natural Sciences Council for the Fetzer Institute, 2012-Present

AAAS Annual John Wesley Powell Memorial Award, 2010

National Academy of Science Frontiers of Science Alumni, 2009

Top 10 Emerging Scholars: Diverse Issues in Higher Education Magazine, 2009

University Nomination for the Packard Award, 2005

Columbia University Teachers College Community Leadership Award, 2006

Inductee, National Geographic Society Emerging Explorer, 2005

Isaac Newton Institute for Mathematical Sciences Junior Fellow, Cambridge University, 2002

Particle Physics and Astronomy Research Council Postdoctoral Fellowship, UK, 2000-2002

Dept. of Education GANN Fellow, 1998-2000

NASA Space Grant Fellow, 1997-1998

New England Board of Higher Ed. Scholar, 1994-1997

Hansiker Award in Mathematics, Haverford College, 1991

7. Grants:

8. Co-PI, Department of Energy (DOE), Frontiers of Dark Energy, \$425,000 (7/13-4/16)

PI, National Science Foundation (NSF) CAREER Award, \$500,000 (9/08-9/13)

PI, FQXi Grant, Cosmology, Quantum Gravity Phenomenology, \$65,000 (7/08-7/10)

PI, Foundational Questions in Physics and Cosmology Mini-Grant \$15,000 (7/07-7/08)

PI, National Geographic Society Emerging Explorer Inductee \$10,000 (2005-2006)

9. Invited Talks, Colloquia, Lectures (100+)

(Workshop) Keynote Address, STEM Caribbean, University College of the Cayman Islands, 2015

Colloquium, Amherst College, 2014

Panel Talk, University of Rome Sapienza, Rome, 2014

Panel Talk, SISSA Phenomenology Group, Trieste, 2014

Panel Talk, Institute de Fisica Teoretica, 2014

Theory Seminar, CERN, Geneva, 2013

Colloquium, Brown University, 2013

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Seminar, The Institute for Advanced Study, 2011 Princeton, NJ Oct 2011

Colloquium, University of the West Indies, Barbados, 2011

Colloquium, Hamilton College, NY, 2011

Colloquium, Rowan University, NJ, Oct 2011

Public Lecture, The University of the West Indies,
Barbados, 2011

Panel Talk. XI Aegean Cosmology School, Greece, 2011

Colloquium, Dartmouth College, 2011

Seminar, MIT, 2010

Seminar Albert Einstein Institute, Berlin Germany, 2010

Invited Talk, GOOGLE Complex, Mountainview, 2010

Panel Talk, NORDITA, Stockholm, Sweden, 2010

Seminar, UC San Diego, CA, 2010

Keynote Address, John Wesley Powell Memorial Lecture American Association for
the Advancement of Science, 2010

Colloquium, Villanova University, 2010

Colloquium, University of Illinois, Urbana Champaign, 2009

Colloquium, The Perimeter Institute of Theoretical Physics, Canada, 2009

Panel Talk, SISSA Phenomenology Group, Trieste, 2014

Panel Talk, Institute de Fisica Teoretica, 2014

Theory Seminar, CERN, Geneva, 2013

Colloquium, Brown University, 2013

Seminar, The Institute for Advanced Study, 2011 Princeton, NJ Oct 2011

Colloquium, University of the West Indies, Barbados, 2011

Colloquium, Hamilton College, NY, 2011

Colloquium, Rowan University, NJ, Oct 2011

Public Lecture, The University of the West Indies,
Barbados, 2011

Panel Talk. XI Aegean Cosmology School, Greece, 2011

Colloquium, Dartmouth College, 2011

Seminar, MIT, 2010

Seminar Albert Einstein Institute, Berlin Germany, 2010

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Stephon Haigh-Solomon Alexander

Invited Talk, GOOGLE Complex, Mountainview, 2010

Panel Talk, NORDITA, Stockholm, Sweden, 2010

Seminar, UC San Diego, CA, 2010

Keynote Address, John Wesley Powell Memorial Lecture (AAAS) American Association for the Advancement of Science, 2010

Colloquium, Villanova University, 2010

Colloquium, University of Illinois, Urbana Champaign, 2009

Colloquium, The Perimeter Institute of Theoretical Physics, Canada, 2009

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Stephon Haigh-Solomon Alexander

Seminar The Perimeter Institute of Theoretical Physics, 2009

Theory Seminar Princeton University, 2009

Keynote Address, Temple University Graduate Symposium, 2009

Invited Talk, Marcel Grossman Meeting, Paris, France, 2009

Colloquium University of Tennessee, 2009

Colloquium Oak Ridge National Laboratories, 2009

Invited Seminar, Florida Atlantic University, 2009

GOOGLE Tech Talk, GOOGLE Complex, 2009

Panel Talk, National Academy of Sciences, New Delhi, India, 2009

Seminar, University of Chicago, 2009

Seminar, Cal Tech, 2009

Seminar, University of Pennsylvania, 2009

Panel Talk, The Annual Meeting of National Society of Black Physicists, 2008

Theory Seminar, University of Pennsylvania, 2007

Colloquium, Haverford College, 2007

Seminar, Mc Gill University, Canada, 2007

Seminar, Carnegie Mellon University, University of Pittsburgh, 2007

Public Lecture, National Geographic Society Headquarters, Wash.

Colloquium, Colgate University, 2006

Seminar, University of Amsterdam, 2006

Seminar, University of Utrecht, 2006

Invited Seminar, UC Berkeley Astrophysics, 2006

Invited Seminar, ISCAP, Columbia, 2006

Seminar, National Society of Black and Hispanic Physicists, 2006

Lecture, McGill University, Canada, 2005

Public Lecture, U. West Indies, Trinidad, W.I., 2005

Plenary Talk, U. British Columbia, 2005

American Physical Society Spring Meeting, 2004

Invited Seminar, Harvard University, 2005

Seminar, MIT, 2005

Departmental Colloquium, Duke University, 2005

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Seminar, California Institute of Technology, 2004
Public Lecture, Duke University, 2004
Colloquium, University of Michigan, 2004
Seminar Jefferson Lab, Hampton Virginia, 2004
Seminar, Perimeter Institute, Canada, 2004
Seminar, New York University, N.Y., 2004
Seminar, UC Berkeley, Berkeley CA, 2004
Seminar, Harvard University, Cambridge, MA, 2003
Columbia University, N.Y, N.Y, 2003
Seminar, Kavli ITP, UCSB, CA, 2003
Seminar, UC Davis, Davis, CA, 2004
Seminar, Cal Tech, Observational Cosmology Group, Pasadena, CA, 2003
Seminar, UCLA , Los Angeles, CA, 2004
National Society of Black Physicists, Atlanta, GA, 2003
Seminar, Perimeter Institute, Canada, 2003
Seminar, McGill University, Montreal, Canada, 2003
University of Geneva, Geneva, Switzerland, 2002
Seminar, Perimeter Institute for Theoretical Physics, Canada, 2002
Seminar, Institute for Advanced Studies, Princeton, NJ, 2002
Seminar, NYU, New York, NY, 2001
Seminar, Brown University, Providence, RI, 2001
Panel Talk, M-Theory Cosmology, Cambridge University, Cambridge, U.K 2001
Panel Talk , Corfu Summer Institute, Corfu, Greece, 2001
Seminar, Columbia University, N.Y., 2001
Colloquium, NASA Goddard Astrophysics Lab, 2001
Public Lecture in London, London, U.K, 2001
Seminar, Cambridge University, U.K, 2001
Seminar, Imperial College, U.K, 2001
Seminar, University of British Columbia, Vancouver, Canada, 2001
Panel Talk, Aspen Center for Physics, Aspen, CO, 2000
Public Talk, Summerbridge School, Providence, RI, 2000
Seminar, University of The West Indies, Kingston, Jamaica, 1999
Seminar, University of British Columbia, Vancouver, Canada, 1999
Seminar, Brown University, Providence, RI, 1997
Talk, Brazilian School of Gravity and Cosmology, Rio de Janeiro, Brazil, 1997

10. Service:

I.) To the University

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Stephon Haigh-Solomon Alexander

Graduate Admissions Committee, Dartmouth College, 2012-2014

Graduate Admissions Committee, Penn State University, 2006-2008

Steering Committee of Institute of Rhetoric and Writing, Dartmouth College, 2014-2015

Organizer for the Annual EE Just Science Symposium, Dartmouth College, 2014

Public Lecture Committee, Dartmouth College, 2012-2014

Organizer for the Annual EE Just Science Symposium, Dartmouth College, 2013

Organizer for the EE Just Science Symposium, Dartmouth College, 2012

Director of the EE Just STEM Scholars Program (60 students, 4 staff), Dartmouth College, 2012-Present

Co-founded the Coleman Interdisciplinary Lecture Series at Haverford College, 2009-2012

Steering Committee, Mellon Mays Undergraduate, Fellowship, 2008-2012

Steering Committee for Hurford Humanities Center, 2008-2011

ii.) To the Profession

Editorial Board, Journal Universe, 2014-Present

Journal Referee: Physics Review Letters, Physics Review D, Journal of Cosmology and Astrophysics, Classical and Quantum Gravity, Physics Letters B, 2001-Present

NSF Graduate Fellowship, Panel 2012

Natural Sciences Advisory Council, Fetzer Institute, 2008-2011

co-Editor and Consultant for National Geographic School Publishing (physics), 2009-2010

Science Advisor, National Lab Day, 2009

Bowdoin College Physics Department Review Committee (10 year cycle), 2010

Board of Director, Network for the Improvement of World Health, Ghana, 2007-2009

Member, Recruiter (18 years), National Society of Black Physicists

Graduate Students Mentored:

(Co-Advised) Nico Yunes, Penn State, Penn State PhD

Princeton Postdoc, Currently tenure track faculty a Montana State

Joseph Ochoa, Graduate Student, Penn State

Completed Ph.D. under my supervision 2011

Currently visiting professor, Haverford

Deepak Vaid, Graduate Student, Penn State

Completed Ph.D. under my supervision this 2011

Currently tenure track faculty National Institute for Technology, Karnataka

Postdoctoral Researchers Mentored:

Tirthabir Biswas, Postdoctoral Fellow, Penn State

Currently tenure track faculty at Loyola University, New Orleans

Antonino Marciano, Postdoctoral Fellow, Dartmouth College

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Currently tenured professor at Fudan University, Shanghai, China

Gianluca Calcagni, Postdoctoral Fellow

Currently tenure track faculty, CSIC Madrid, Spain

11. Undergraduate Research Students:

Stephan Johnson, Dartmouth Student, Class of 2016

Luis Martinez, Dartmouth Student, Class of 2015

Martin Blood-Forsythe, Haverford College

Apker Award Finalist, Churchill Award, Goldwater Scholarship

M.S. Physics, Cambridge University

Currently a Ph.D. student in Physics at Harvard University

Deriba Olana, Harvard University

Currently Ph.D. in Applied Physics at Harvard University

Annie Preston '12, Haverford College

Currently my thesis student, applying to physics theory Ph.D. programs

Alex Cahill '11, Haverford College

Senior Thesis student, currently Physics Ph.D. student at UCLA Garrett

Vanacore '11, Haverford College

Senior Thesis student, Current Ph.D. at U. Illinois, condensed matter theory

Samuel Rodrigues '13, Haverford College

Goldwater Fellowship

Currently a Physics Ph.D. student at MIT

