Zachary S. Slepian

Contact Information

Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, CA 94720
E-mail: zslepian@lbl.gov
Office phone: 510-495-2316
Citizenship: American

Research Interests

Theoretical and observational cosmology; algorithm development and high-performance computing for large-scale structure clustering.

Current Position

Chamberlain Fellow (2016–) & Einstein Fellow (2017–), Lawrence Berkeley National Laboratory

Education

Harvard University, Cambridge, Massachussetts, USA

Ph.D., Astronomy & Astrophysics, May 2016
Thesis title: "Revitalizing the 3-Point Correlation Function of Galaxies to Sharpen the BAO Standard Ruler"
A.M., Astronomy, May 2014

Trinity College, University of Oxford, Oxford, Oxfordshire, UK

M.St., Philosophy of Physics, June 2012

Princeton University, Princeton, New Jersey, USA

A.B., Astrophysical Sciences, **summa cum laude**, June 2011
Thesis title: "Slow-Roll Dark Energy"
Minors in Values and Public Life, Applied and Computational Mathematics

Awards

Einstein Fellowship, January 2017.

Keto Prize for best Ph.D. thesis in theoretical astrophysics at Harvard, May 2016.

Hubble Fellowship (declined), January 2016.

National Science Foundation Graduate Research Fellowship, April 2012.

Certificate of Distinction in Teaching, Harvard Bok Center, for overall scores of 4.5/5 on teaching evaluations in Astronomy 16 (Spring 2014).

Prizes for student short project on MW rotation curve: best presentation and best scientific content, 42$^{\text{nd}}$ SLAC Summer Institute "Shining Light on Dark Matter", August 2014.

Award for Excellent Performance in M.St., Trinity College, August 2012.

Summer Academic Bursary for Research, Trinity College, May 2012.

Sigma Xi Book Award, May 2011—for outstanding research and departmental record in Astrophysical Sciences at Princeton.

Los Alamos National Laboratory Student Symposium Prize in Physics, 2009.

Robert C. Byrd Scholarship, 2007-2011 – $1,500 yearly funding awarded to $\sim$ 80 students by CT Dept. of Education.

Teaching

AY 2015-16—Harvard University, Teaching Fellow, Astronomy 130.
AY 2014-15—Harvard University, Teaching Fellow, Physics 95.
AY 2013-14—Harvard University, Teaching Fellow, Astronomy 16.
AY 2012-13—Harvard University, Teaching Fellow, Science of the Physical Universe 22.
AY 2011-12—University of Oxford Physics Dept., Junior Demonstrator.

Outreach & Service

Referee for MNRAS, 2017–.

DESI-2 working group member, January 2017–.

Local Organizing Committee member, Berkeley Center for Cosmological Physics workshop "Cosmology with Neutral Hydrogen," January 2017.

astrobites astro-ph reader's digest—Co-Chair, Hiring Committee; Daily Writing Rotation; Editorial Board, 2011-present—30+ articles authored, similar number edited; ran two rounds (2014, 2015) of author recruitment and selection; currently Chair for Undergraduate Research Summaries section of site.

Supervision—Directed two high school students in one and two-month long projects to compute the baryon-dark matter relative velocity at the time of the Milky Way's formation (one student was through Research Science Institute at MIT), July-August 2016. RSI student received award for one of the ten best presentations at RSI.

Supervision—Directed a high school student from Turkey in a month-long research project using a novel 3-point correlation function algorithm to study galactic dust (through Research Science Institute at MIT), July 2015.

Peer mentoring—For first year graduate student (August 2015 on), for CfA Solar Physics REU student (June-August 2014).

Princeton Prison Teaching Initiative, New Jersey State Prisons—Instructed and graded in math courses, helped design and write new physics and astronomy course, 2010-2011, 2014 onwards.

Chandra Peer Review Facilitator—Recorded ratings and served as scribe for Chandra X-Ray Observatory proposal review panel, June 22-26, 2015.

Cambridge Science Festival—Conducted demonstrations and answered questions for adults and the young at Center for Astrophysics as part of Cambridge Science Festival, April 19, 2015.

Classroom Visits—Led two classes of 7^{th} graders at the Eliot School (Boston) in hands-on activities focused on General Relativity as part of Einstein anniversary celebrations/Cambridge Science Festival, March-April 2015.

Public Lecture "The sounds of space: the BAO and linear structure formation," ASAASA, December 2014.

Public Lecture "Why do galaxies cluster as they do?" Elmbrook Student Center, October 2014.

Public Lecture "Our Universe's Story: from Chaos to Cosmos," Harvard Medical School (through Harvard Science in the News), October 2014.

Public Lecture "A brief summary of the Universe," Cambridge Senior Center, June 2014.

Talks and Posters

Berkeley Astronomy Department Lunch, "The Neutrino Green's Function Before Recombination", February 2017.

DESI lunch, LBNL, "The Neutrino Green's Function Before Recombination", February 2017.

DESI lunch, LBNL, "Beyond Pairs: Higher-Order Clustering Opportunities for DESI", December 2016.

DESI workshop, University of Ohio, "Beyond Pairs: Higher-Order Clustering Opportunities for DESI", December 2016.

"Neutrinos & Gastrophysics" workshop, CITA, "The Neutrino Green's Function", December 2016.

Poster at "Star formation, magnetic fields, and diffuse matter in the galaxy", UW Madison, "Tracing MHD Turbulence in the ISM using the 3-Point Correlation Function of Dust", May 2016.

Harvard-Smithsonian Center for Astrophysics, ITC Luncheon (Keto Prize Talk), "Revitalizing the 3-point correlation function of galaxies to sharpen the BAO standard ruler," May 2016.

CITA/Dunlap Institute at the University of Toronto, "The baryon-dark matter relative velocity and a new approach to the 3-point correlation function," January 2016.

UC Berkeley, "Statistical Sampling & Non-Sampling Methods in Cosmology" workshop, "A new approach to the 3-point correlation function of galaxies," January 2016.

Harvard-Smithsonian Center for Astrophysics, ITC Luncheon, "A new approach to the 3-point correlation function of galaxies," December 2015.

Yale University, "A new approach to the 3-point correlation function of galaxies," December 2015.

Princeton University, "The baryon-dark matter relative velocity and a new approach to the 3-point correlation function," October 2015.

Stanford University, "The baryon-dark matter relative velocity and a new approach to the 3-point correlation function," September 2015.

Lawrence Berkeley National Laboratory, "The baryon-dark matter relative velocity and a new approach to the 3-point correlation function," September 2015.

University of Portsmouth, Institute for Cosmology and Gravitation, "Towards Understanding the Impact of the Baryon-Dark Matter Relative Velocity on the 2 and 3-Point Correlation Functions," June 2015.

University of Cambridge, Institute of Astronomy, "Towards Understanding the Impact of the Baryon-Dark Matter Relative Velocity on the 2 and 3-Point Correlation Functions," June 2015.

Posters at 42$^{\text{nd}}$ SLAC Summer Institute "Shining Light on Dark Matter," Stanford, CA, "Ruling Out Bosonic Repulsive Dark Matter in Thermal Equilibrium" and "How dark matter, baryons, and radiation imprint scales on galaxy clustering today," August 2014.

Poster at Sackler Conference "Debates on the Nature of Dark Matter," Cambridge, MA, "Ruling Out Bosonic Repulsive Dark Matter in Thermal Equilibrium," May 2014.

Harvard-Smithsonian Center for Astrophysics, ITC Luncheon, "Baryon-dark matter relative velocity's effect on the BAO: a simple detection template," February 2014.

Poster at American Astronomical Society 223rd meeting, Washington, DC, "Detecting the Relative Velocity Effect with SDSS," January 2014.

Harvard-Smithsonian Center for Astrophysics, ITC Luncheon, "Ruling out bosonic repulsive dark matter in thermal equilibrium," April 2013.

Harvard-Smithsonian Center for Astrophysics, Graduate Student/Pre-Doc Forum, "Slow Roll Dark Energy," April 2013.

University of Oxford, Astrophysics Sub-Department, "Polarized foregrounds & the tensor modes," August 2012.

Trinity College, University of Oxford, MCR/SCR Academic Forum, "Why do ice-cubes melt? Time's arrow and the beginning of time," May 2012.

Princeton Planck Workshop, "Slow Roll Dark Energy: Observational Predictions," February 2011.

Los Alamos National Laboratory Center for Non-Linear Studies, "To Trap or Not to Trap? Electron behavior on elastic nanowires," January 2010.