

Adam R. Solomon

Department of Physics, 5000 Forbes Avenue, Pittsburgh, PA 15213

email: adamsolo@andrew.cmu.edu

web: <http://andrew.cmu.edu/~adamsolo/>

RESEARCH INTERESTS

Theoretical cosmology: dark energy, dark matter, inflation, baryogenesis; field theory; modified gravity; cosmological tests.

EMPLOYMENT HISTORY

Sep. 2018-present **Carnegie Mellon University**
Postdoctoral Research Associate
Department of Physics and McWilliams Center for Cosmology

Sep. 2015-Aug. 2018 **University of Pennsylvania**
Postdoctoral Fellow
Center for Particle Cosmology

Apr. 2015-Jul. 2015 **University of Heidelberg**
DAAD Visiting Fellow
Institute for Theoretical Physics

Dec. 2014-Feb. 2015 **University of Cambridge**
Research Assistant
Department of Applied Mathematics and Theoretical Physics

EDUCATION

2011-2015 **University of Cambridge – Ph.D.**
Department of Applied Mathematics and Theoretical Physics
Thesis: *Cosmology Beyond Einstein*
Supervisor: Prof. John D. Barrow

2010-2011 **University of Cambridge – Master of Advanced Study in Mathematics**
Part III of the Mathematical Tripos (Distinction)
Essay: *Probing the Very Early Universe with the Stochastic Gravitational Wave Background*
Supervisors: Prof. Paul Shellard, Dr. Eugene Lim

2006-2010 **Yale University – B.S. in Astronomy and Physics**
Thesis: *The Sunyaev-Zel'dovich Effect in the Wilkinson Microwave Anisotropy Probe Data*
Supervisors: Prof. Daisuke Nagai, Dr. Suchetana Chatterjee

PUBLICATIONS AND CONFERENCE PROCEEDINGS

1. **Solomon, A. R.**, Vardanyan, V., & Akrami, Y., "Massive mimetic cosmology." 2019, Phys. Lett. B 794, 135, arXiv: 1902.08533
2. Khoury, J., Sakstein, J., & **Solomon, A. R.**, "Superfluids and the Cosmological Constant Problem." 2018, JCAP08(2018)024, arXiv:1805.05937
3. **Solomon, A. R.** & Trodden, M., "Higher-derivative operators and effective field theory for general scalar-tensor theories." 2017, JCAP02(2018)031, arXiv:1709.09695
4. Sakstein, J. & **Solomon, A. R.**, "Baryogenesis in Lorentz-violating gravity theories." 2017, Phys. Lett. B 773, 186, arXiv:1705.10695
5. Carrillo González, M., Masoumi, A., **Solomon, A. R.**, & Trodden, M. "WKB approximation and tunneling in theories with non-canonical kinetic terms." 2017, Phys. Rev. D. 96, 056021, arXiv:1703.00909
6. Nersisyan, H., Akrami, Y., Amendola, L., Koivisto, T. S., Rubio, J., & **Solomon, A. R.** "Instabilities in tensorial nonlocal gravity." 2016, Phys. Rev. D 95, 043539, arXiv:1610.01799
7. Carrillo González, M., Masoumi, A., **Solomon, A. R.**, & Trodden, M. "Solitons in generalized galileon theories." 2016, Phys. Rev. D 94, 125013, arXiv:1607.05260
8. Lüben, M., Akrami, Y., Amendola, L., & **Solomon, A. R.** "Aller guten Dinge sind drei: Cosmology with three interacting spin-2 fields." 2016, Phys. Rev. D 94, 043530, arXiv:1604.04285
9. Bull, P., Akrami, Y., *et al.* "Beyond Λ CDM: Problems, solutions, and the road ahead." 2016, Phys. Dark Univ. 12, 56-99, arXiv:1512.05356
10. Akrami, Y., Hassan, S. F., Könnig, F., Schmidt-May, A., & **Solomon, A. R.** "Bimetric gravity is cosmologically viable." 2015, Phys. Lett. B 748, 37, arXiv:1503.07521
11. Enander, J., Akrami, Y., Mörtzell, E., Renneby, M., & **Solomon, A. R.** "Integrated Sachs-Wolfe effect in massive bigravity." 2015, Phys. Rev. D 91, 084046, arXiv:1501.02140
12. **Solomon, A. R.**, Enander, J., Akrami, Y., Koivisto, T. S., Könnig, F., & Mörtzell, E. "Cosmological viability of massive gravity with generalized matter coupling" 2015, JCAP04(2015)027, arXiv:1409.8300
13. Enander, J., **Solomon, A. R.**, Akrami, Y., & Mörtzell, E. "Cosmic expansion histories in massive bigravity with symmetric matter coupling." 2014, JCAP01(2015)006, arXiv:1409.2860
14. Jazayeri, S., Akrami, Y., Firouzjahi, H., **Solomon, A. R.**, & Wang, Y. "Inflationary power asymmetry from domain walls." 2014, JCAP11(2014)044, arXiv:1408.3057
15. Könnig, F., Akrami, Y., Amendola, L., Motta, M., & **Solomon, A. R.** "Stable and unstable cosmological models in bimetric massive gravity." 2014, Phys. Rev. D 90, 124014, arXiv:1407.4331
16. **Solomon, A. R.**, Akrami, Y., & Koivisto, T. S. "Linear growth of structure in massive bigravity." 2014, JCAP10(2014)066, arXiv:1404.4061
17. Akrami, Y., Koivisto, T. S., & **Solomon, A. R.** "The nature of spacetime in bigravity: two metrics or none?" 2014, Gen. Relativ. Gravit. 47, 1838, arXiv:1404.0006
18. **Solomon, A. R.**, & Barrow, J. D. "Inflationary Instabilities of Einstein-Aether Cosmology." 2014, Phys. Rev. D 89, 024001
19. Brooks, A. M., **Solomon, A. R.**, Governato, F., McCleary, J., MacArthur, L., Brook, C., Jonsson, P., Quinn, T., & Wadsley, J. "Interpreting the Evolution of the Size-Luminosity Relation for Disk Galaxies from Redshift 1 to the Present." 2010, ApJ, 728, 51
20. Cruz, K.L, Kirkpatrick, J. D., Burgasser, A. J., Looper, D., Mohanty, S., Prato, L., Faherty, J., & **Solomon, A.** "A New Population of Young Brown Dwarfs." 2008, 14th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ASP Conference Series, Vol. 384
21. Cruz, K. L., Reid, I. N., Kirkpatrick, J. D., Burgasser, A. J., Liebert, J., **Solomon, A. R.**, Schmidt, S. J., Allen, P. R., Hawley, S. L., & Covey, K. R. "Meeting the Cool Neighbors. IX. The Luminosity Function of M7-L8 Ultracool Dwarfs in the Field." 2007, AJ, 133, 439

TALKS

| | | |
|----------------|---|------------|
| November 2018 | Brown University | Seminar |
| November 2018 | MIT/Tufts Cosmology Seminar | Seminar |
| November 2018 | University of Delaware | Seminar |
| September 2018 | Syracuse University | Seminar |
| July 2018 | <i>Cosmology and Gravitational Physics with Lambda</i> Nordic Institute for Theoretical Physics | Conference |
| April 2018 | McWilliams Center for Cosmology Carnegie Mellon University | Seminar |
| December 2017 | Harvard-Smithsonian Center for Astrophysics Harvard University | Seminar |
| November 2017 | Stanford Institute for Theoretical Physics Stanford University | Seminar |
| October 2017 | Perimeter Institute for Theoretical Physics | Seminar |
| October 2017 | Kavli Institute for Cosmological Physics University of Chicago | Seminar |
| October 2017 | Columbia University | Seminar |
| September 2017 | Johns Hopkins University | Seminar |
| September 2017 | Center for Cosmology and Particle Physics New York University | Seminar |
| August 2017 | COSMO 2017, Paris | Conference |
| June 2017 | University of Amsterdam | Seminar |
| June 2017 | PASCOS 2017, Madrid | Conference |
| June 2017 | Lorentz Institute for Theoretical Physics University of Leiden | Seminar |
| May 2017 | Institute for Advanced Study & Princeton University | Seminar |
| June 2016 | Department of Applied Mathematics and Theoretical Physics University of Cambridge | Seminar |
| June 2016 | Institute for Cosmology and Gravitation University of Portsmouth | Seminar |
| May 2016 | Institute for Theoretical Physics University of Heidelberg | Seminar |
| May 2016 | Nordic Institute for Theoretical Physics KTH Royal Institute of Technology and Stockholm University | Seminar |
| May 2016 | <i>Hot Topics in Modern Cosmology: Spontaneous Workshop X</i> Institut d'Études Scientifiques de Cargèse | Conference |
| April 2016 | <i>Northeast String Cosmology Meeting</i> Columbia University | Conference |
| December 2015 | Case Western Reserve University | Seminar |
| September 2015 | University of Delaware | Seminar |
| April 2015 | Institute for Theoretical Physics University of Heidelberg | Seminar |

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| March 2015 | <i>Xth Iberian Cosmology Conference</i> Aranjuez | Conference |
| March 2015 | <i>Extended Theories of Gravity</i> Nordic Institute for Theoretical Physics KTH Royal Institute of Technology and Stockholm University | Conference |
| February 2015 | London Relativity and Cosmology Seminar Queen Mary, University of London | Conference |
| November 2014 | University of Nottingham | Seminar |
| October 2014 | <i>Dark Energy Interactions</i> Nordic Institute for Theoretical Physics KTH Royal Institute of Technology and Stockholm University | Conference |
| September 2014 | <i>UK Cosmology</i> University of Oxford | Conference |
| September 2014 | University of California, Berkeley | Seminar |
| May 2014 | Institute for Theoretical Physics University of Heidelberg | Seminar |
| May 2014 | Center for Particle Cosmology University of Pennsylvania | Seminar |
| May 2014 | Center for Cosmology and Particle Physics New York University | Seminar |
| May 2014 | Perimeter Institute for Theoretical Physics | Seminar |
| February 2014 | Department of Applied Mathematics and Theoretical Physics University of Cambridge | Seminar |
| January 2014 | Nordic Institute for Theoretical Physics KTH Royal Institute of Technology and Stockholm University | Seminar |
| January 2014 | Institute of Theoretical Astrophysics University of Oslo | Seminar |
| December 2013 | <i>27th Texas Symposium on Relativistic Astrophysics</i> Department of Physics University of Texas at Dallas | Conference |
| September 2013 | <i>COSMO 2013</i> Department of Applied Mathematics and Theoretical Physics University of Cambridge | Conference |

CONFERENCES, WORKSHOPS, AND SCHOOLS

- **Cosmology and Gravitational Physics with Lambda**
July 30th-August 3rd, 2017
Nordic Institute for Theoretical Physics, Stockholm, Sweden
- **COSMO 2017**
August 28th-September 1st, 2017
Paris, France
- **Theoretical Approaches to Cosmic Acceleration: Connecting String, Supergravity and Quantum Field Theory Aspects of (Near-) De Sitter Space**
July 3rd-7th, 2017
Lorentz Center, Leiden, Netherlands
- **PASCOS 2017**
June 19th-23rd, 2017
Madrid, Spain
- **NYU-Columbia-Penn Joint Cosmology and Particle Physics Meeting**
May 12th, 2017
University of Pennsylvania, US
- **Bangs, Bounces, Black Holes, and Bubbles: Where General Relativity meets Cosmology**
May 11th, 2017
Princeton Center for Theoretical Science, US
- **New Frontiers in Gravitational Radiation**
December 9th-10th, 2016
University of Pennsylvania, US
- **Hot Topics in Modern Cosmology: Spontaneous Workshop X** (workshop – invited speaker)
May 9th-14th, 2016
Institut d'Études Scientifiques de Cargèse, France
- **Northeast String Cosmology Meeting**
April 22nd, 2016
Columbia University, US
- **New Frontiers in Entanglement** (workshop)
April 7th-8th, 2016
University of Pennsylvania, US
- **New Frontiers in Particle Cosmology** (workshop)
December 3rd-4th, 2015
University of Pennsylvania, US
- **Xth Iberian Cosmology Conference**
March 30th-April 1st, 2015
Aranjuez, Spain
- **Extended Theories of Gravity** (Nordita program – invited participant)
March 2nd-March 20th, 2015
Nordic Institute for Theoretical Physics, Stockholm, Sweden
- **UK Cosmo**
February 27th, 2015
Queen Mary, University of London, UK
- **Beyond Λ CDM**
January 13th-17th, 2015
Oslo, Norway
- **Dark Energy Interactions**
October 1st-3rd, 2014
Nordic Institute for Theoretical Physics, Stockholm, Sweden
- **UK Cosmo**

September 23rd, 2014
University of Oxford, UK

- **COSMO 2014**
August 25th-29th, 2014
Chicago, US
- **Cosmology and the Constants of Nature**
March 17th-19th, 2014
Department of Applied Mathematics and Theoretical Physics
University of Cambridge, UK
- **The Structure of Gravity and Spacetime** (workshop – invited participant)
February 6th-7th, 2014
University of Oxford, UK
- **27th Texas Symposium on Relativistic Astrophysics**
December 8th-13th, 2013
Department of Physics
University of Texas at Dallas, US
- **COSMO 2013**
September 2nd-6th, 2013
Department of Applied Mathematics and Theoretical Physics
University of Cambridge, UK
- **Tales of Lambda**
July 1st-6th, 2013
Centre for Astronomy and Particle Theory
University of Nottingham, UK
- **Infinites and Cosmology**
March 18th-21st, 2013
Department of Applied Mathematics and Theoretical Physics
University of Cambridge, UK
- **Sixth TRR33 Winter School on Cosmology**
December 9th-14th, 2012
Passo del Tonale, Italy
- **Gravity Beyond Einstein**
September 27th, 2012
Institute of Physics, London, UK
- **Cosmological Frontiers in Fundamental Physics** (workshop)
May 29th-June 1st, 2012
Solvay Institute, Brussels, Belgium
- **The State of the Universe: Stephen Hawking 70th Birthday Conference**
January 5th-8th, 2012
Department of Applied Mathematics and Theoretical Physics
University of Cambridge, UK

TEACHING EXPERIENCE

- **Undergraduate** (University of Cambridge)
 - Cosmology (Fall 2011)
 - General Relativity (Spring 2012, 2013, 2014)
- **Graduate** (University of Cambridge)
 - Cosmology (Fall 2012, 2013, 2014)

MAJOR AWARDS AND FELLOWSHIPS

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| 2017 | Delta ITP Visitor, University of Leiden |
| 2017 | PhD thesis published in Springer Theses series <i>Nominated as an outstanding PhD thesis by the University of Cambridge</i> |
| 2015 | DAAD Research Grant for PhD Students, Postdocs, and Junior Academics |
| 2014 | Cambridge Philosophical Society Research Studentship |
| 2014 | NORDITA Visiting PhD Student Fellowship |
| 2011 | Gledhill Research Studentship, Sidney Sussex College, University of Cambridge |
| 2011 | Isaac Newton Studentship, University of Cambridge |
| 2011 | Tyson Medal, University of Cambridge <i>For the best performance in subjects relating to astronomy. Awarded only at the discretion of the examiners.</i> |
| 2011 | Jennings Prize, Wolfson College, University of Cambridge <i>For performance on the Part III examinations.</i> |
| 2010 | Ellsworth Prize, Jonathan Edwards College, Yale University <i>For the best senior thesis in the sciences.</i> |
| 2008 | Caltech Summer Undergraduate Research Fellowship (SURF) |
| 2007 | Caltech and Siemens Foundation Summer Undergraduate Research Fellowship (SURF) |
| 2006 | Intel Science Talent Search – Finalist (8 th place) |
| 2006 | Davidson Fellow – \$25,000 |
| 2005 | Siemens Competition – Finalist (3 rd place) |

PROFESSIONAL ACTIVITIES

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| Since 2015 | Referee, <i>Physics Letters B; General Relativity and Gravitation; Annals of Physics; Physics of the Dark Universe; European Physical Journal C; Europhysics Letters</i> . Reviewer, NASA Earth and Space Science Fellowship Program |
| 2015 | Group leader, Beyond Λ CDM conference, Oslo |
| 2014 | Organized bigravity meeting at Cambridge for collaborators from Oslo, Stockholm, and Heidelberg |
| 2013 - 2015 | Organizer, DAMTP cosmology journal club |
| 2011 - 2015 | Group leader, Part III (masters students) seminar series |

REFERENCES

Prof. Mark Trodden
Fay R. and Eugene L. Langberg Professor of Physics
Center for Particle Cosmology, University of Pennsylvania
209 S. 33rd St. Philadelphia, PA 19102 USA
+1 (215) 898-7938
trodden@physics.upenn.edu

Prof. Justin Khoury
Professor of Physics
Center for Particle Cosmology, University of Pennsylvania
209 S. 33rd St. Philadelphia, PA 19102 USA
+1 (215) 573-7152
jkhoury@sas.upenn.edu

Prof. Scott Dodelson
Professor of Physics
McWilliams Center for Cosmology, Carnegie Mellon University
5000 Forbes Ave. Pittsburgh, PA 15213 USA
+1 (412) 268-5432
sdodelso@andrew.cmu.edu

Prof. John D. Barrow
Professor of Mathematical Sciences
DAMTP, Centre for Mathematical Sciences, University of Cambridge
Wilberforce Road, Cambridge, CB3 0WA UK
+44 1223 766 696
j.d.barrow@damtp.cam.ac.uk

Prof. Luca Amendola
Professor (W3)
Institut für Theoretische Physik, Universität Heidelberg
Philosophenweg 16, Heidelberg, Germany
+49-6221-549-407
l.amendola@thphys.uni-heidelberg.de