

**Adam R. Solomon**

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

**email:** adamsolo@andrew.cmu.edu

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

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**RESEARCH INTERESTS**

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

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**EMPLOYMENT HISTORY**

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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

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**EDUCATION**

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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

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## PUBLICATIONS AND CONFERENCE PROCEEDINGS

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1. Khoury, J., Sakstein, J., & **Solomon, A. R.**, "Superfluids and the Cosmological Constant Problem." 2018, JCAP08(2018)024, arXiv:1805.05937
2. **Solomon, A. R.** & Trodden, M., "Higher-derivative operators and effective field theory for general scalar-tensor theories." 2017, JCAP02(2018)031, arXiv:1709.09695
3. Sakstein, J. & **Solomon, A. R.**, "Baryogenesis in Lorentz-violating gravity theories." 2017, Phys. Lett. B 773, 186, arXiv:1705.10695
4. 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
5. 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
6. Carrillo González, M., Masoumi, A., **Solomon, A. R.**, & Trodden, M. "Solitons in generalized galileon theories." 2016, Phys. Rev. D 94, 125013, arXiv:1607.05260
7. 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
8. Bull, P., Akrami, Y., *et al.* "Beyond  $\Lambda$ CDM: Problems, solutions, and the road ahead." 2016, Phys. Dark Univ. 12, 56-99, arXiv:1512.05356
9. 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
10. 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
11. **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
12. 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
13. Jazayeri, S., Akrami, Y., Firouzjahi, H., **Solomon, A. R.**, & Wang, Y. "Inflationary power asymmetry from domain walls." 2014, JCAP11(2014)044, arXiv:1408.3057
14. 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
15. **Solomon, A. R.**, Akrami, Y., & Koivisto, T. S. "Linear growth of structure in massive bigravity." 2014, JCAP10(2014)066, arXiv:1404.4061
16. 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
17. **Solomon, A. R.**, & Barrow, J. D. "Inflationary Instabilities of Einstein-Aether Cosmology." 2014, Phys. Rev. D 89, 024001
18. 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
19. 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
20. 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

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**TALKS**

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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>X<sup>th</sup> 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

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## CONFERENCES, WORKSHOPS, AND SCHOOLS

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

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September 23<sup>rd</sup>, 2014  
University of Oxford, UK

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

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**TEACHING EXPERIENCE**

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

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**MAJOR AWARDS AND FELLOWSHIPS**

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2017	Delta ITP Visitor, University of Leiden
2017	PhD thesis published, Springer Theses series
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 <sup>th</sup> place)
2006	Davidson Fellow – \$25,000
2005	Siemens Competition – Finalist (3 <sup>rd</sup> place)

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**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 $\Lambda$ 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

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## REFERENCES

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Prof. Mark Trodden  
Fay R. and Eugene L. Langberg Professor of Physics  
Center for Particle Cosmology, University of Pennsylvania  
209 S. 33<sup>rd</sup> 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. 33<sup>rd</sup> St. Philadelphia, PA 19102 USA  
+1 (215) 573-7152  
jkhoury@sas.upenn.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