Marc Kamionkowski

William R. Kenan Jr. Professor
Johns Hopkins University
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Personal

Born on 27 July 1965.

United States Citizen.

Education

B.A. (*summa cum laude*) Physics, Washington University in St. Louis, 1987

Ph.D. Physics, University of Chicago, 1991

Professional History

William R. Kenan, Jr. Professor of Physics and Astronomy, Johns Hopkins University, 2016–

Professor of Physics and Astronomy, Johns Hopkins University, 2011–2015

Robinson Professor of Theoretical Physics and Astrophysics, California Institute of Technology, 2006–2012

Miller Visiting Research Professor, Department of Physics, University of California, Berkeley, Fall 2010

Founding Director, Moore Center for Theoretical Cosmology and Physics, Caltech, 2006–2011

Professor of Theoretical Physics and Astrophysics, California Institute of Technology, 1999–2006

Associate Professor, Department of Physics, Columbia University, 1998–1999

Assistant Professor, Department of Physics, Columbia University, 1994–1998

Long-Term Member, Institute for Advanced Study, 1994

Member, Institute for Advanced Study, 1991–1994

Awards and Honors

Discovery Award, Johns Hopkins University, 2018

Fellow, American Association for the Advancement of Science, 2017

Hans Jensen Lecturer, University of Heidelberg, October 2017

Finalist, Krieger School of Arts and Sciences Excellence in Teaching Award (for Graduate Teaching and Mentoring), 2017

Fellow, International Society of General Relativity and Gravitation, 2016

Dannie Heineman Prize for Astrophysics, AAS/AIP, 2015

Distinguished Fellow, Kosciuszko Foundation Collegium of Eminent Scientists, 2014

Simons Foundation Investigator, 2014–2019

Rosenblum Lecturer, Hebrew University, March 2014

Member, American Academy of Arts and Sciences, 2013

Shaker Heights High School Hall of Fame, Elected 2013

Fellow, American Physical Society, 2008

DoE Ernest O. Lawrence Award (High Energy and Nuclear Physics), 2006

DoE Outstanding Junior Investigator, 1998–1999

Helen B. Warner Prize, American Astronomical Society, 1998

Alfred P. Sloan Foundation Fellow, 1996–1998

SSC National Fellow, 1991–1993

NASA GSRP Fellow, July 1989–Sept 1991

Phi Beta Kappa, May 1986

National Merit Scholar, 1983–1987

Professional Societies

American Academy of Arts and Sciences

International Astronomical Union

Astronomical Society of the Pacific

American Association for the Advancement of Science

American Physical Society

American Astronomical Society

International Society of General Relativity and Gravitation

Professional Service

Editor in Chief, *Physics Reports*, 2008–present

Astrophysics and Cosmology Editor, *Physics Reports*, 1998–present

Nominating Committee for the Executive Committee of the APS Division of Astrophysics, 2018

Honorary Member, Aspen Center for Physics, 2018–

Chair, External Review Committee, Washington University Physics Department, September 2017

Advisor, Simons Foundation Origins of the Universe initiative, 2017–present

Member, HST Fundamental Physics Working Group, 2017

Member, Local Organizing Committee, Second Annual Intensity Mapping Workshop, Johns Hopkins University, 12–14 June 2017

External Review Committee, Brown University Department of Physics, April 2017

Five-Year Expert Panel Review Committee, Canadian Institute for Advanced Research "Cosmology & Gravity" program, 2016

APS Hans A. Bethe Prize Selection Committee, 2017–2018

CERN-TH Advisory Committee on Cosmology, 2016

NSF/DoE Nuclear Science Advisory Committee Subcommittee on Neutrino-less Double Beta Decay, 2015

Member-at-Large, Division of Astrophysics Executive Committee of the American Physical Society, 2015–2017

Trustee, Aspen Center for Physics, 2010–

Search Committee Member for Director, Oskar Klein Centre, Stockholm University, 2015

DoE HEP INSPIRE Review Panel, 2015

Member, NSF MPS AC Subcommittee on NSF Response to the P5 Strategic Plan, 2014–2015

Member, Nominations Committee for arXiv Scientific Advisory Board, 2014

Member, Advisory Board, The Buchalter Cosmology Prize, 2014–

Advisor, Simons Foundation Physics Programs, 2011–2012

Member, Nominating Committee, Division of Astrophysics, American Physical Society, 2009

Member, Particle Astrophysics Scientific Assessment Group (PASAG), 2009

Member, Cosmology and Fundamental Physics Panel of Astro2010 (Astronomy and Astrophysics Decadal Survey), 2009–2010

Co-organizer, "New Horizons for Modern Cosmology," a workshop at the Galileo Galilei Institute for Theoretical Physics, Florence, January–March 2009

Co-organizer, "Understanding the Dark Sector: Dark Matter and Dark Energy," Aspen Winter Workshop, January 2009

Co-organizer, Aspen Winter Workshop on the CMB, January 2008

Fermilab Research Alliance Visiting Committee, 2008–2011

Member, Advisory Board, *Journal of Cosmology and Astroparticle Physics*, 2005–

Scientific Secretary (2009) and Assistant Scientific Secretary (2008), Aspen Center for Physics

Member, Aspen Center for Physics, 2004–2013

Annual Program Review Committee, Fermilab, 2007

Receiving Editor, *Journal of Cosmology and Astroparticle Physics*, 2002–2005

Receiving Editor, *Journal of High Energy Physics*, 1997–2003

External Advisory Committee, Physics Division, Lawrence Berkeley Laboratory, 2004–2005

Member, Dark Energy Task Force, 2005–2006

External Advisory Committee, VERITAS, 2003–2004

Advisory Committee, NSF Center for Cosmological Physics (University of Chicago), 2002–2004.

Particle Physics Project Prioritization Panel (P5), 2002–2004.

Co-organizer, 15th Annual Beckman U.S. Frontiers of Science Symposium, November 2003, Irvine, CA

Co-convenor, Working Group P4 on Astro/Cosmo/Particle Physics for the workshop, Snowmass 2001: The Future of Particle Physics

Referee for the reports of the Committee on Physics of the Universe, 2000, 2002

Theory and Computation Panel, NAS Astronomy and Astrophysics Survey Committee, 1998–2000

Internal Referee for the report of the Astronomy and Astrophysics Survey Committee, 1999–2000

NASA/NSF/DoE Cosmic Genesis and Fundamental Physics Working Group, 1999–2000

NASA Structure and Evolution of the Universe Subcommittee, 1998–2002

NASA Science Working Group and Facilities Science Team for the Gamma Ray Large Area Space Telescope, 1996–1999

NASA Ad Hoc Committee on Future Cosmic Microwave Background Missions 1998–1999

Co-organizers, "Theoretical Astrophysics in Southern California (TASC)," a workshop held at Caltech, October 26, 2001

Coordinator, "The New Cosmology Confronts Observation: The Cosmic Microwave Background, Dark Matter, Dark Energy, and Brane Worlds," an ITP (Santa Barbara) workshop held August–December 2002

Coordinator, "Probing the Universe with the Cosmic Microwave Background," an ITP (Santa Barbara) mini-workshop, July 2000.

Co-organizer, Aspen workshop on "The Dark Side of the Universe," Aspen, CO, June 2000.

Co-organizer, "Energy Densities in the Universe," Les Arcs, France, January 2000.

Super-convener for "Origin of the Universe" session of the Workshop on Cosmic Genesis and Fundamental Physics, Sonoma State University, October 28–30, 1999.

Advising

Ph.D. Students

Current Students

Tanvi Karwal (Ph.D. 2019)

Daniel Pfeffer (Ph.D. 2019)

Hiro Nishikawa (PhD. 2020

Lingyuan Ji (Ph.D. 2021)

Cyril Creque-Sarbinowski (Ph.D. 2021)

Gabriela Sato-Polito (Ph.D. 2022)

Past Students

Patrick Breysse, Ph.D. 2017 (Postdoc, CITA)

Julian Muñoz, Ph.D. 2017 (Postdoc, Harvard)

Liang Dai, Ph.D. 2015 (Einstein Fellow, IAS)

Vera Gluscevic, Ph.D. 2013 (assistant professor, U. of Florida)

Samuel Lee, Ph.D. 2012 (Computational Scientist, MIT/Harvard Broad Institute)

Laura Book, Ph.D. 2012 (Software engineer, Google)

Anthony Pullen, Ph.D. 2011 (assistant professor, New York University)

Daniel Grin, Ph.D. 2010 (assistant professor, Haverford College)

Adrienne Erickcek, Ph.D 2009 (assistant professor, U. of North Carolina)

Tristan L. Smith, Ph.D. 2008 (assistant professor, Swarthmore College)

Jonathan Pritchard, Ph.D. 2007 (senior lecturer, Imperial College)

Kris R. Sigurdson, Ph.D. 2005 (associate professor, University of British Columbia)

Nevin N. Weinberg, Ph.D. 2005 (assistant professor, MIT)

Michael H. Kesden, Ph.D. 2005 (assistant professor, UT Dallas)

Michael R. Santos, Ph.D. 2004 (Deputy Director, Bill and Melinda Gates Foundation)

Alexandre Refregier, Ph.D. 1997 (Professor, Zurich)

Catherine Cress, Ph.D 1998 (Professor, University of the Western Cape, South Africa)

Xuelei Chen, Ph.D 1999 (Professor, National Astronomical Observatories, China)

Ari Buchalter, Ph.D. 1999 (CEO, Intersection)

Postdocs

Current Postdocs

Ely Kovetz 2014–

Kim Boddy, 2017–

Tommi Tenkanen, 2018–

Past Postdocs

Vivian Poulin, 2017–2018 (Research scientist, CNRS Montpellier)

Ilias Cholis, 2015–2018 (assistant professor, Oakland University)

Tomohiro Nakama, 2016–2018 (postdoc, HKUST)

Simeon Bird, 2015–2017 (assistant professor, UC Riverside)

Yacine Ali-Haïmoud, 2014–2017 (assistant professor, NYU)

Alvise Raccanelli, 2014–2016 (CERN Fellow)

Jennifer Siegal-Gaskins, 2011–2014 (GRAPPA, Amsterdam)

Jens Chluba, 2012–2014 (Royal Society Fellow, Manchester)

Donghui Jeong, 2010–2014 (assistant professor, Penn State)

Josef Pradler, 2012–2014 (assistant professor, Vienna)

Matthew Kistler, 2010–2011 (postdoc, Stanford)

Fabian Schmidt, 2009–2012 (faculty, Max Planck Institute Garching)

Shin'ichiro Ando, 2006–2011 (associate professor, U. of Amsterdam)

Daniel Babich, 2006–2008 (Fortelus Capital Management)

Annika Peter, 2007–2010 (assistant professor, Ohio State U.)

Daisuke Nagai, 2005–2008 (associate professor, Yale University)

Stefano Profumo, 2005–2007 (professor, University of California, Santa Cruz)

Nicole Bell, 2004–2006 (associate professor, University of Melbourne)

Elena Pierpaoli, 2004–2006 (professor, University of Southern California)

Steven Furlanetto 2003–2006 (professor, UCLA)

Eric Agol, 2000–2003 (professor, University of Washington)

Andriy Kurylov, 2002–2004 (JP Morgan Chase)

Lara Arielle Phillips, 2002–2005 (research assistant professor, Notre Dame University)

Milos Milosavljevic, 2002–2006 (associate professor, University of Texas, Austin)

Asantha Cooray, 2001–2004 (professor, UC Irvine)

Andrew Benson, 2000–2003 (Scientist, Carnegie Observatories)

Paolo Catelan, 2000–2001

Siang-Peng Oh, 2000–2003 (professor, UC Santa Barbara)

Kenneth Nollett, 2000–2002 (professor, San Diego State)

Limin Wang, 1998–2000 (SMG Quantitative)

Piero Ullio, 1999–2000 (professor, SISSA, Trieste)

Frank J. Summers, July 1996–March 1998 (scientist, Space Telescope Science Institute)

Classroom Teaching:

Quantum Field Theory, 2017–2018, 2018–2019. A full-year graduate-level class.

Astrophysics of Compact Objects, Fall 2011. A graduate-level class.

Major Open Questions in Physics, Winter 2004. A seminar-type class for undergraduates.

Quantum Mechanics of the Universe, Spring 2011. A one-semester seminar course on for undergraduate students on current research topics in cosmology and particle astrophysics.

Advanced Quantum Mechanics, Spring 2003. An honors-level class for upper-level undergraduates,

Waves, Quantum Mechanics, and Statistical Physics, Fall 2009. A class for nonmajor sophomores.

Interstellar Medium, Winter 2011. A one-quarter class for graduate students in astronomy.

High-energy astrophysics, Spring 2009. A one-quarter class for graduate students in astronomy.

Stellar Structure and Evolution, Fall 2003, 2004, 2005. A one-quarter class for graduate students in astronomy.

The Physics of Stars, Fall 2002. A one-quarter class for advanced undergraduates.

Extragalactic Astronomy and Cosmology, Spring 2000, 2004,2005, 2008, 2010. A one-quarter class on cosmology for first-year graduate students in astronomy.

Particle Astrophysics and Cosmology, 2000–2001, Fall 2012, Spring 2017. An advanced graduate seminar on the early Universe, physical cosmology, and particle astrophysics. Taught for a full year at Caltech and as a one-semester class at Johns Hopkins.

Radiative Processes, Fall 2001, 2007. A one-quarter class on radiative processes for first-year graduate students.

Quantum Mechanics, Spring 2002, 2006. The third quarter of a one-year quantum mechanics sequence for juniors.

Graduate Quantum Mechanics, 1998–1999, 2013–2014, 2014–2015, Fall 2016 A quantum mechanics course for first-year graduate students.

General Relativity, Spring 1998, 2004–2005, 2006–2007. A graduate level course on general relativity (one semester at Columbia University and a full-year class at Caltech).

Cosmology, Fall 1997. A graduate level class on cosmology. Topics included classical cosmology, large-scale structure and the cosmic microwave background, physics of the early Universe, and dark matter.

Mathematical Methods for Physicists, Fall 1995, 1996. A class on mathematical methods and asymptotic techniques for advanced undergraduates and beginning graduate students.

Advanced Mechanics, Spring 1995, 1996, 1997. A class on Lagrangian and Hamiltonian dynamics (with some applications to galactic dynamics) for advanced undergraduates and beginning graduate students.

Publications

Submitted Articles

7. **"Searching for Oscillations in the Primordial Power Spectrum with CMB and LSS Data,"** C. Zeng, E. D. Kovetz, X. Chen, J. B. Muñoz and M. Kamionkowski, arXiv:1812.05105 [astro-ph.CO]. Submitted to Phys. Rev. D.

6. **"Chiral photons from chiral gravitational waves,"** K. Inomata and M. Kamionkowski, arXiv:1811.04959 [astro-ph.CO]. Submitted to Phys. Rev. Lett.

5. **"Circular polarization of the cosmic microwave background from vector and tensor perturbations,"** K. Inomata and M. Kamionkowski, arXiv:1811.04957 [astro-ph.CO]. Submitted to Phys. Rev. D.

4. **"Early Dark Energy Can Resolve The Hubble Tension,"** V. Poulin, T. L. Smith, T. Karwal and M. Kamionkowski, arXiv:1811.04083 [astro-ph.CO]. Submitted to Phys. Rev. Lett.

3. **"Pulsar-timing arrays, astrometry, and gravitational waves,"** W. Qin, K. K. Boddy, M. Kamionkowski and L. Dai, arXiv:1810.02369 [astro-ph.CO]. Submitted to Phys. Rev. D.

2. **"A Critical Assessment of CMB Limits on Dark Matter-Baryon Scattering: New Treatment of the Relative Bulk Velocity,"** K. K. Boddy, V. Gluscevic, V. Poulin, E. D. Kovetz, M. Kamionkowski and R. Barkana, arXiv:1808.00001 [astro-ph.CO]. Submitted to Phys. Rev. D.

1. **"Primordial-black-hole mergers in dark-matter spikes,"** H. Nishikawa, E. D. Kovetz, M. Kamionkowski and J. Silk, arXiv:1708.08449 [astro-ph.CO]. Submitted to Phys. Rev. D.

Refereed Journal Articles

232. **"Where do the AMS-02 anti-helium events come from?"** V. Poulin, P. Salati, I. Cholis, M. Kamionkowski and J. Silk, arXiv:1808.08961 [astro-ph.HE]. To appear in Phys. Rev. D.

231. **"Cross-correlations between scalar perturbations and magnetic fields in bouncing universes,"** D. Chowdhury, L. Sriramkumar and M. Kamionkowski, arXiv:1807.05530 [astro-ph.CO]. To appear in JCAP.

230. **"Strong Lensing of Gamma Ray Bursts as a Probe of Compact Dark Matter,"** L. Ji, E. D. Kovetz and M. Kamionkowski, Phys. Rev. D. **98**, 123523, no. 12 (2018) [arXiv:1809.09627 [astro-ph.CO]].

229. **"Tighter Limits on Dark Matter Explanations of the Anomalous EDGES 21cm Signal,"** E. D. Kovetz, V. Poulin, V. Gluscevic, K. K. Boddy, R. Barkana and M. Kamionkowski, Phys. Rev. D **98**, no. 10, 103529 (2018) [arXiv:1807.11482 [astro-ph.CO]].

228. **"Enhancing the cross-correlations between magnetic fields and scalar perturbations through parity violation,"** D. Chowdhury, L. Sriramkumar and M. Kamionkowski, JCAP **10**, 031 (2018) [arXiv:1807.07477 [astro-ph.CO]].

227. **"Cosmological implications of ultra-light axion-like fields,"** V. Poulin, T. L. Smith, D. Grin, T. Karwal and M. Kamionkowski, Phys. Rev. D **98**, no. 8, 083525 (2018) [arXiv:1806.10608 [astro-ph.CO]].

226. **"Searching for Decaying and Annihilating Dark Matter with Line Intensity Mapping,"** C. Creque-Sarbinowski and M. Kamionkowski, Phys. Rev. D **98**, no. 6, 063524 (2018) [arXiv:1806.11119 [astro-ph.CO]].

225. **"Studying the Milky Way Pulsar Population with Cosmic-Ray Leptons,"** I. Cholis, T. Karwal and M. Kamionkowski, Phys. Rev. D **98**, no. 6, 063008 (2018) [arXiv:1807.05230 [astro-ph.HE]].

224. **"Circular polarization in a spherical basis,"** M. Kamionkowski, Phys. Rev. D. **97**, 123529 (2018) [arXiv:1804.06412 [astro-ph.CO]].

223. **"The implications of an extended dark energy cosmology with massive neutrinos for cosmological tensions,"** V. Poulin, K. K. Boddy, S. Bird and M. Kamionkowski, Phys. Rev. D. **97**, 123504 (2018) [arXiv:1803.02474 [astro-ph.CO]].

222. **"Limits on Runaway Growth of Intermediate Mass Black Holes from Advanced LIGO,"** E. D. Kovetz, I. Cholis, M. Kamionkowski and J. Silk, Phys. Rev. D. **97**, 123003 (2018) [arXiv:1803.00568 [astro-ph.HE]].

221. **"Features in the Spectrum of Cosmic-Ray Positrons from Pulsars,"** I. Cholis, T. Karwal and M. Kamionkowski, Phys. Rev. D **97**, 123011 (2018) [arXiv:1712.00011] [astro-ph.HE].

220. **"The merger rate of primordial-black-hole binaries,"** Y. Ali-Haïmoud, E. D. Kovetz and M. Kamionkowski, Phys. Rev. D. **96**, 123523 (2017) [arXiv:1709.06576 [astro-ph.CO]].

219. **"Large-Distance Lens Uncertainties and Time-Delay Measurements of H_0,"** J. B. Muñoz and M. Kamionkowski, Phys. Rev. D. **96**, 103537 (2017) [arXiv:1708.08454 [astro-ph.CO]].

218. **"Shedding light on the small-scale crisis with CMB spectral distortions,"** T. Nakama, J. Chluba and M. Kamionkowski, Phys. Rev. D. **95**, 121302(R) (2017) (Editor's suggestion, and featured as a *Physics* Synopsis) [arXiv:1703.10559 [astro-ph.CO]].

217. **"Black Hole Mass Function from Gravitational Wave Measurements,"** E. D. Kovetz, I. Cholis, P. C. Breysse and M. Kamionkowski, Phys. Rev. D. **95**, 103010 (2017) [arXiv:1611.01157 [astro-ph.CO]].

216. **"Towards a measurement of the spectral runnings,"** J. B. Muñoz, E. D. Kovetz, A. Raccanelli, M. Kamionkowski and J. Silk, JCAP **1705**, 032 (2017) [arXiv:1611.05883 [astro-ph.CO]].

215. **"Dust polarization and ISM turbulence,"** R. R. Caldwell, C. Hirata and M. Kamionkowski, Astrophys. J. **839**, 91 (2017) [arXiv:1608.08138 [astro-ph.GA]].

214. **"Cosmic microwave background limits on accreting primordial black holes,"** Y. Ali-Haïmoud and M. Kamionkowski, Phys. Rev. D **95**, no. 4, 043534 (2017) (Editor's Suggestion) [arXiv:1612.05644 [astro-ph.CO]].

213. **"Stochastic gravitational waves associated with the formation of primordial black holes,"** T. Nakama, J. Silk and M. Kamionkowski, Phys. Rev. D. **95**, no. 4, 043511 (2017) [arXiv:1612.06264 [astro-ph.CO]].

212. **"Insights from probability distribution functions of intensity maps,"** P. C. Breysse, E. D. Kovetz, P. S. Behroozi, L. Dai and M. Kamionkowski, Mon. Not. R. Astron. Soc. **467**, 2996 [arXiv:1609.01728 [astro-ph.CO]].

211. **"Ultra-high-energy-cosmic-ray hot spots from tidal disruption events,"** D. N. Pfeffer, E. D. Kovetz and M. Kamionkowski, Mon. Not. R. Astron. Soc. **466**, 2922 (2017) [arXiv:1512.04959 [astro-ph.HE]].

210. **"Evolution of CMB spectral distortion anisotropies and tests of primordial non-Gaussianity,"** J. Chluba, E. Dimastrogiovanni, M. A. Amin and M. Kamionkowski, Mon. Not. R. Astron. Soc. **466**, 2390 (2017) [arXiv:1610.08711 [astro-ph.CO]].

209. **"Early dark energy, the Hubble-parameter tension, and the string axiverse,"** T. Karwal and M. Kamionkowski, Phys. Rev. D **94**, no. 10, 103523 (2016) [arXiv:1608.01309 [astro-ph.CO]].

208. **"Orbital eccentricities in primordial black holes binaries,"** I. Cholis, E. D. Kovetz, Y. Ali-Haïmoud, S. Bird, M. Kamionkowski, J. B. Muñoz and A. Raccanelli, Phys. Rev. D **94**, no. 8, 084013 (2016) [arXiv:1606.07437 [astro-ph.HE]].

207. **"Cross-correlation between thermal Sunyaev-Zeldovich effect and the integrated Sachs-Wolfe effect,"** C. Creque-Sarbinowski, S. Bird and M. Kamionkowski, Phys. Rev. D **94**, 063519 [arXiv:1606.00839 [astro-ph.CO]].

206. **"Lensing of Fast Radio Bursts as a Probe of Compact Dark Matter,"** J. B. Muñoz, E. D. Kovetz, L. Dai and M. Kamionkowski, Phys. Rev. Lett. **117**, 091301 (2016) (Editor's Suggestion) [arXiv:1605.00008 [astro-ph.CO]].

205. **"Curvature constraints from Large Scale Structure,"** E. Di Dio, F. Montanari, A. Raccanelli, R. Durrer, M. Kamionkowski and J. Lesgourgues, JCAP **1606**, no. 06, 013 (2016) [arXiv:1603.09073 [astro-ph.CO]].

204. **"Violation of statistical isotropy and homogeneity in the 21-cm power spectrum,"** M. Shiraishi, J. B. Muñoz, M. Kamionkowski and A. Raccanelli, Phys. Rev. D **93**, no. 10, 103506 (2016) [arXiv:1603.01206 [astro-ph.CO]].

203. **"Did LIGO detect dark matter?"** S. Bird, I. Cholis, J. B. Muñoz, Y. Ali-Haïmoud, M. Kamionkowski, E. D. Kovetz, A. Raccanelli and A. G. Riess, Phys. Rev. Lett. **116**, 201301 (2016) (Featured as a *Physics* Synopsis) [arXiv:1603.00464 [astro-ph.CO]].

202. **"Cosmological tests of an axiverse-inspired quintessence field,"** R. Emami, D. Grin, J. Pradler, A. Raccanelli and M. Kamionkowski, Phys. Rev. D **93**, no. 12, 123005 (2016) [arXiv:1603.04851 [astro-ph.CO]]. (Mar 15, 2016)

201. **"Search for Compensated Isocurvature Perturbations with Planck Power Spectra,"** J. B. Muñoz, D. Grin, L. Dai, M. Kamionkowski and E. D. Kovetz, Phys. Rev. D **93**, 043008 (2016) [arXiv:1511.04441 [astro-ph.CO]].

200. **"The high redshift star-formation history from carbon-monoxide intensity maps,"** P. C. Breysse, E. D. Kovetz and M. Kamionkowski, Mon. Not. Roy. Astron. Soc. **457**, L127 (2016) [arXiv:1507.06304 [astro-ph.CO]].

199. **"Antisymmetric galaxy cross-correlations as a cosmological probe,"** L. Dai, M. Kamionkowski, E. D. Kovetz, A. Raccanelli and M. Shiraishi, Phys. Rev. D **93**, 023507 (2016) [arXiv:1507.05618 [astro-ph.CO]].

198. **"Constraints on Dark Matter Interactions with Standard Model Particles from Cosmic Microwave Background Spectral Distortions,"** Y. Ali-Haïmoud, J. Chluba and M. Kamionkowski, Phys. Rev. Lett. **115**, 071304 (2015) [arXiv:1506.04745 [astro-ph.CO]].

197. **"Primordial non-gaussianity from the bispectrum of 21-cm fluctuations in the dark ages,"** J. B. Muñoz, Y. Ali-Haïmoud and M. Kamionkowski, Phys. Rev. D **92**, 083508 (2015) (Editor's Suggestion) [arXiv:1506.04152 [astro-ph.CO]].

196. **"Imprints of Massive Primordial Fields on Large-Scale Structure,"** E. Dimastrogiovanni, M. Fasiello and M. Kamionkowski, JCAP **1602**, 017 (2016) [arXiv:1504.05993 [astro-ph.CO]].

195. **"Probing the scale dependence of non-Gaussianity with spectral distortions of the cosmic microwave background,"** R. Emami, E. Dimastrogiovanni, J. Chluba and M. Kamionkowski, Phys. Rev. D **91**, 123531 (2015) [arXiv:1504.00675 [astro-ph.CO]].

194. **"Masking line foregrounds in intensity mapping surveys,"** P. C. Breysse, E. D. Kovetz and M. Kamionkowski, Mon. Not. Roy. Astron. Soc. **452**, 3408 (2015) [arXiv:1503.05202 [astro-ph.CO]].

193. **"Detecting the integrated Sachs-Wolfe effect with high-redshift 21-cm surveys,"** A. Raccanelli, E. Kovetz, L. Dai and M. Kamionkowski, Phys. Rev. D **93**, 083512 (2016) [arXiv:1502.03107 [astro-ph.CO]].

192. **"Strategy to minimize dust foregrounds in *B*-mode searches,"** E. D. Kovetz and M. Kamionkowski. Phys. Rev. D **91**, 081303 (2015) [arXiv:1502.00625 [astro-ph.CO]].

191. **"An Ultimate Target for Dark Matter Searches,"** K. Blum, Y. Cui and M. Kamionkowski, Phys. Rev. D **92**, 023528 (2015) [arXiv:1412.3463 [hep-ph]].

190. **"Equation-of-State Parameter for Reheating,"** J. B. Muñoz and M. Kamionkowski, Phys. Rev. D **91**, 043521 (2015) [arXiv:1412.0656 [astro-ph.CO]].

189. **"Dark energy from the string axiverse,"** M. Kamionkowski, J. Pradler and D. G. E. Walker, Phys. Rev. Lett. **113**, 251302 (2014) [arXiv:1409.0549 [hep-ph]].

188. **"The redshift-space galaxy two-point correlation function and baryon acoustic oscillations,"** D. Jeong, L. Dai, M. Kamionkowski and A. S. Szalay, Mon. Not. Roy. Astron. Soc. **449**, 3312 (2015) [arXiv:1408.4648 [astro-ph.CO]].

187. **"Statistical diagnostics to identify Galactic foregrounds in B-mode maps,"** M. Kamionkowski and E. D. Kovetz, Phys. Rev. Lett. **113**, 191303 (2014) (Featured as a *Physics* Synopsis) [arXiv:1408.4125 [astro-ph.CO]].

186. **"Inflationary tensor fossils in large-scale structure,"** E. Dimastrogiovanni, M. Fasiello, D. Jeong and M. Kamionkowski, JCAP **1412**, 050 (2014) [arXiv:1407.8204 [astro-ph.CO]].

185. **"Spectral distortions from the dissipation of tensor perturbations,"** J. Chluba, L. Dai, D. Grin, M. Amin and M. Kamionkowski, Mon. Not. Roy. Astron. Soc. **446**, 2871 (2015) [arXiv:1407.3653 [astro-ph.CO]].

184. **"Carbon Monoxide Intensity Mapping at Moderate Redshifts,"** P. C. Breysse, E. D. Kovetz and M. Kamionkowski, Mon. Not. Roy. Astron. Soc. **443**, 3506 (2014) [arXiv:1405.0489 [astro-ph.CO]].

183. **"Reheating constraints to inflationary models,"** L. Dai, M. Kamionkowski and J. Wang, Phys. Rev. Lett. **113**, 041302 (2014) [arXiv:1404.6704 [astro-ph.CO]].

182. **"Tensor-induced B modes with no temperature fluctuations,"** M. Kamionkowski, L. Dai and D. Jeong, Phys. Rev. D **89**, 107302 (2014) [arXiv:1404.3730 [astro-ph.CO]].

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2. **"Particle Astrophysics and Cosmology: Cosmic Laboratories for New Physics (Summary of the Snowmass 2001 P4 Working Group),"** D. S. Akerib, S. M. Carroll, M. Kamionkowski, and S. Ritz, in "Snowmass 2001: The Future of Particle Physics," edited by N. Graf, SLAC eConf **C010630**, P4001 (2002) [arXiv:hep-ph/0201178].

1. **"Cosmic Microwave Background Observations in the Post-Planck Era,"** J. B. Peterson *et al.*, arXiv:arXiv:astro-ph/9907276. Report of the NASA *Ad Hoc* Committee on Future Cosmic Microwave Background Missions.

Books

3. *Memorial Volume in Honor of Gerald E. Brown*, edited by Marc Kamionkowski, Michael Ramsey-Musolf, Sanjay Reddy, and Achim Schwenk (Elsevier, Amsterdam, 2016) [*Physics Reports* **621**].

2. *GGI–Dark Matter and Dark Energy 2009, new horizons for modern cosmology*, proceedings of the Galileo Galilei Institute Conferences on Dark Matter and Dark Energy, Florence, Italy, 19th January – 13th March 2009, "New Horizons For Modern Cosmology," 19 January–13 March 2009, Arcetri, Florence, Italy, edited by M. Kamionkowski, C. Martins, A. Melchiorri, A. Polosa and L. Verde.

1. *David Schramm's Universe*, edited by Gerald E. Brown, Marc Kamionkowski, and Michael S. Turner (North-Holland, Amsterdam, 2000) [*Physics Reports* **333**].

Popular Articles, Comments, and Book Reviews

11. **"Andrew E. Lange (1957-2010),"** a National Academy of Sciences biographical memoir, http://www.nasonline.org/publications/biographical-memoirs.

10. **"Commentary: BICEP2's B modes: Big Bang or Dust?"** Mario Livio and Marc Kamionkowski, *Physics Today* **67**, 8 (2014).

9. **"Viewpoint: Is the Lopsided Universe an Open Universe?"** M. Kamionkowski, APS Physics **6**, 98 (2013).

8. **"Gravity Ripples Chased,"** Marc Kamionkowski, *Nature* **460**, 964–965 (2009).

7. **"Dark Matter and Dark Energy,"** Robert Caldwell and Marc Kamionkowski, *Nature* **458**, 587–589 (2009).

6. **"A Hawking-Eye View of the Universe,"** review of Stephen Hawking's *The Universe in a Nutshell*, Marc Kamionkowski, *Science* **296**, 267 (2002).

5. **"Weird notions that drive science"** (review of *Strange Matters: Undiscovered Ideas at the Frontiers of Space and Time* by Tom Siegfried), Marc Kamionkowski, *Nature* **420**, 362–363 (2002).

4. **"A New Window to the Early Universe,"** Eric Hivon and Marc Kamionkowski, *Science* **298**, 1349–1350 (2002) [arXiv:arXiv:astro-ph/0211553].

3. **"Gravitational Echoes from the Big Bang,"** Robert R. Caldwell and Marc Kamionkowski, *Scientific American* January 2001, 38–43 (2001). Updated and reprinted in a "The Once and Future Cosmos," a special edition of *Scientific American*, October 2002.

2. **"New Troubles for Inflation?"** Marc Kamionkowski and Andrew Jaffe, *Nature* **395**, 639–641 (1998).

1. **"The Case of the Curved Universe: Open, Closed, or Flat,"** Marc Kamionkowski, *Science* **280**, 1397–1398 (1998) [arXiv:astro-ph/9806347].

Popular Talks, Interviews, and Public Outreach

"Cosmic ripples from black holes and the big bang," public lecture at the Space Telescope Science Institute, 4 December 2018.

Zelicoff Dinner Speaker, Krieger School of Arts and Sciences, November 8, 2018.

Honorary speaker at science honors societies induction ceremony at Hereford High School, Parkton, MD, October 10, 2018.

"The quest for cosmic B modes," talk at Quarknet 2018, Johns Hopkins University, July 23, 2018.

"Black holes and dark Matter," talk at Quarknet 2017, Johns Hopkins University, July 27, 2017.

"Cosmic Ripples from Black Holes and the Big Bang," public lecture at the Vienna Natural History Museum, Vienna, Austria, 1 December 2016.

"Did LIGO Detect Dark Matter?" talk at Quarknet 2016, Johns Hopkins University, July 26, 2016.

Interviewed on Voice of America's "Press Conference US," 8 July 2016, about black holes and dark matter.

Interviewed about LIGO on ABC2 News "In Focus," 23 February 2016.

"Secrets from the Early Universe," interview on *StarSpot* podcast, 19 April 2015.

"A Telegram from the Early Universe?" public lecture at the Origins Institute, McMaster University, Hamilton, Ontario, 2 December 2014.

"A Telegram from the Early Universe?" public lecture at the Cleveland Museum of Natural History, 14 November 2014.

"Dark matter and the equivalence principle," a discussion for physics students at Shaker Heights High School, 14 November 2014.

"A Telegram from the Early Universe?" public lecture at the Space Telescope Science Institute, 11 November 2014.

"A Telegram from the Early Universe?" invited talk at *New Horizons in Science*, sponsored by the Council for the Advancement of Science Writing, Columbus, OH, 20 October 2014.

Interviewed for NHK Japan TV documentary series, "Cosmic Front," episode to be aired 27 November 2014.

Interviewed about inflation for Russian TV channel LIFENEWS, 22 August 2014.

"Unraveling the Early Universe with the Cosmic Microwave Background," talk at Quarknet 2014, Johns Hopkins University, July 30, 2014.

Distinguished Outside Expert for Harvard-Smithsonian Center for Astrophysics press conference announcing new results from the BICEP2 collaboration, 17 March 2014.

"Beauty and Blemishes in the Universe," Aspen Center for Physics public lecture, 22 Aug 2013, Aspen, CO.

Interviewed for Aspen Physics Previews, Grassroots TV, Aspen, CO, 14 Aug 2013.

Guest on Kathleen Dunn show, Wisconsin Public Radio, 30 April 2013.

Distinguished Outside Expert for NASA's news teleconference on Planck cosmology findings, 21 March 2013.

Interviewed for Euronews TV special, "Planck Maps the Dawn of Time," released 21 March 2013.

"Dark Matter, the Equivalence Principle, and the Sagittarius Dwarf Galaxy," talk at Quarknet 2012, Johns Hopkins University, August 2, 2012.

"Dark Matter and the Equivalence Principle," lunch talk at the law firm of Munger, Tolles, and Olson, Los Angeles, CA, May 16, 2011.

"The Big Rip: A New Fate for the Universe?" IUCAA, Pune, India, July 31, 2008.

"Apocalypse: The Big Rip," talk at Categorically Not!, Santa Monica, CA, September 24, 2006.

"Weird Gravity: Phantom Energy and the Big Rip," talk for the Southern California Association of Physics Teachers, October 25, 2003.

"Weird Gravity?" An Update for Members of the Legal Profession," lunch talk at the law firm of Munger, Tolles, and Olson, Los Angeles, CA, April 14, 2003.

"What's New in Cosmology? An Update for Members of the Legal Profession," lunch talk at the law firm of Munger, Tolles, and Olson, Los Angeles, CA, August 27, 2001.

"Birth of the Universe," LIGO popular talk, Richland, WA, August 12, 2001.

"Birth of the Universe," invited talk at the Jack R. Howard Science Reporting Institute (for journalists), Caltech, June 29,2001.

"Birth of the Universe," Caltech Seminar Day (popular talk for Caltech alumni), May 19, 2001.

"Cosmology and Astrophysics," invited talk at the Jack R. Howard Science Reporting Institute (for journalists), Caltech, August 18, 2000.

Panelist for "Origins of the Universe," a Bard Center Panel Discussion, New York City, April 24, 1998.

Selected Media Coverage

Black-hole dark-matter worked discussed in "Controversy Continues over Black Holes as Dark Matter," *Physics* **11**, 99, 1 October 2018

Quoted in LiveScience article on newly black-hole dark matter, 6 April 2018

Quoted in Associated Press article on newly reported dark-matter-free galaxies, 28 March 2018

Quoted in Associated Press article on newly reported signature of the first stars, 1 March 2018

Quoted in *Los Angeles Times* article on LIGO discovery of second black hole, 15 June 2016

"LIGO, forse un solo Nobel non basta," article on black-hole dark matter, Media INAF (Italy) 18 May 2016

"Some astrophysicists think LIGO may have spotted a dark matter signal," *Motherboard* article on black-hole dark matter, 18 May 2016.

"Physicists hunt for the big bang's triangles," *Quanta* article on work on primordial non-Gaussianities, 19 April 2016.

"Did LIGO detect dark matter? Black holes that produced gravitational waves may also be key to the missing mass mystery," *Daily Mail* article on work on black holes and LIGO, 24 March 2016.

"LIGO could catch dark matter made of black holes," *New Scientist* article on work on black holes and LIGO, 22 March 2016.

Quoted in *Science* article, "Woohoo! email stokes rumor that gravitational waves have been detected," 5 February 2016, and several other news sources after the LIGO announcement.

Quoted in *Scientific American* article, "Not all gravitational waves are created equal," 14 January 2016.

"Stringy fields may make the Universe swell faster," *New Scientist* article on work on dark energy, 12 September 2014.

Quoted in major news sources around the world following the 17 March 2014 announcement from BICEP2. This includes the *New York Times* Quotation of the Day 18 March 2014 and quotation on "Wait Wait Don't Tell Me," the NPR news quiz show, 22 March 2014.

"In Lopsided Map of the Universe, a Glimmer of Its Origins," *Quanta Magazine* article on work on power asymmetry (reprinted in wired.com), 14 June 2013.

Quoted in major news sources around the world following the 21 March 2013 announcement of results from the Planck Satellite.

"How to Survive the End of the Universe," *Discover* magazine article on the Big Rip, December 2011.

"New Theories May Shed Light on Dark Matter," *Scientific American* article on work on dark matter and dark radiation, 10 November 2008.

"Hints of Structure Beyond the Visible Universe," *New Scientist* article on work on the power asymmetry, 10 June 2008.

"From Space, a New View of Doomsday," *New York Times* article on the Big Rip, 17 February 2004.

"No Extra Gravity for Dark Matter," *Science* Magazine article on work on the equivalence principle, 3 October 2006.

"Universal Migraine," *Los Angeles Times* editorial on the Big Rip, 29 March 2003.

"Will the Universe End in a Big Rip," NBC *News Today* article on the Big Rip, 4 March 2003.

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