

Dr. Andrew Samuel Friedman - Curriculum Vitae

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EDUCATION

May 2012 Ph.D. **Harvard University**, Astronomy & Astrophysics

Thesis: Infrared Light Curves of Type Ia Supernovae

June 2006 A.M. **Harvard University**, Astronomy

Thesis: Toward a More Standardized Candle Using GRB Energetics & Spectra

Dec 2001 B.A. **University of California, Berkeley**, Physics & Astrophysics

Summa Cum Laude, Phi Beta Kappa, Highest Honors in Physics, Highest Distinction in General Scholarship, *Thesis: The Lick Observatory Supernova Search: Type Ia Supernovae, Cosmology, and the Accelerating Universe*

PROFESSIONAL APPOINTMENTS

2017 – Assistant Research Scientist, **UC San Diego** Center for Astrophysics & Space Sciences

2017 – Research Affiliate, Program in STS, **Massachusetts Institute of Technology (MIT)**

2014-17 Research Associate, Program in Science, Technology, & Society (STS), **MIT**

2012-16 Visiting Research Scientist, **MIT** Center for Theoretical Physics

2012-14 National Science Foundation STS Postdoctoral Fellow, **MIT**

FELLOWSHIPS, HONORS, & AWARDS

2012-14 National Science Foundation STS Postdoctoral Fellowship, **MIT**

2006-09 National Aeronautics & Space Administration (**NASA**) Graduate Student Research Program Fellowship, **Harvard University / NASA Goddard Spaceflight Center**

2002-06 National Science Foundation (**NSF**) Graduate Research Fellowship, **Harvard Univ.**

2004-05 Certificate of Distinction in Teaching, **Harvard University** (Spring 2004, Fall 2005)

2003-07 James Mills Peirce Fellowship, Department of Astronomy, **Harvard University**

GRANTS AND TELESCOPE AWARDS

2019-22 **NASA Hubble Space Telescope**, Cycle 27-28, GO-15889, (\$263,064), “Supernovae in the Infrared avec Hubble”, Co-I with PI Saurabh Jha, Rutgers University

2015-20 **National Science Foundation, NSF INSPIRE Award PHYS #1541160** (\$900,360): “Testing Bell’s Inequality with Astrophysical Observations”, Co-PI Andrew Friedman (UCSD) with David Kaiser, Alan Guth (MIT); Co-Is Jason Gallicchio (Harvey Mudd), Brian Keating (UCSD) [with Anton Zeilinger (Vienna)]

2019 **Foundational Questions Institute FQXi Collaborative Mini-Grant**, (\$2,000) “Foundational Quantum Experiments with Astronomical Observations”, PI Andrew Friedman (UCSD); Co-Is David Kaiser (MIT), Jason Gallicchio (Harvey Mudd), 1/25/19-3/31/19

2019 **Gordon and Betty Moore Foundation** (\$6,000), “Screening Events: PBS NOVA Documentary, Einstein’s Quantum Riddle”, PI Andrew Friedman (UCSD, 3/4/19), with Co-I Jason Gallicchio (Harvey Mudd, 2/4/19)

2015-17 **NASA Hubble Space Telescope**, Cycle 23, Phase II, Award GO-14216 (\$320,686) “**RAISIN2**: Tracers of cosmic expansion with SN IA in the IR”, Co-I with PI, Robert Kirshner, Harvard University

- 2016-17 **NASA Jet Propulsion Laboratory R&TD Innovative Spontaneous Concept Proposal** (\$43,690), “Uncorrelated Random Number Generators from Astrophysical Processes”, Co-I with PI Hien Nguyen (JPL/Caltech), Jason Gallicchio (Harvey Mudd), David Kaiser (MIT)
- 2015 **Foundational Questions Institute FQXi Mini-Grant** (\$1,500) “Testing the Foundations of Quantum Mechanics with Cosmological Observations”, PI Alan Guth (MIT); Co-I with David Kaiser (MIT), Jason Gallicchio (Chicago), Anton Zeilinger (Vienna), Brian Keating (UCSD), 1/1/15-9/1/15
- 2012-14 **National Science Foundation, NSF SES Award #1056580** (\$120,000) “Dark Energy, Fine-Tuning, and the Multiverse: Testing Theories in Modern Cosmology”, Co-PI with David Kaiser (MIT)
- 2012-14 **NASA Hubble Space Telescope**, Cycle 20, Phase II, Award GO-13046 (\$350,542) “**RAISIN**: Tracers of cosmic expansion with SN IA in the IR”, Co-I with PI, Robert Kirshner, Harvard University
- 2013 **Rutgers Templeton Project in the Philosophy of Cosmology** (\$3,000) to attend the “Institute for the Philosophy of Cosmology”, UC Santa Cruz, 6/23-7/14/13
- 2005-13 **Peters Automated InfraRed Imaging TELEscope**, 13 Semesters 2005a-2013a, Awarded 300 hours each, Fred Lawrence Whipple Observatory, “CfA Supernova Program: Photometry with the PAIRITEL 1.3-m”, Co-I with PI, Robert Kirshner, Harvard University
- 2010 **NASA Infrared Telescope Facility**, Sem 2010A, “Using NIR Spectra from Type Ia Supernovae to Constrain NIR Light Curves and Physics”, Co-I with PI, Howie Marion, Harvard University
- 2007-08 **NASA Swift Satellite**, Cycle 4, Award #NNH07ZDA001N-SWIFT407, “Investigation of the UV Properties of Supernovae With Swift”, Co-I with PI, Robert Kirshner, Harvard University

TEACHING

- 2018 Lecturer, “Cosmology”, **UC San Diego** (Spring 2018)
- 2012-15 Co-Leader, “Harvard/MIT Philosophy of Science Group”, **Harvard University**
- 2015 Teaching Fellow, “The Energetic Universe”, **Harvard University** (Spring 2015)
- 2005 Teaching Fellow, “Cosmic Connections”, **Harvard University** (Fall 2005)
- 2004, 2005 Teaching Fellow, “Matter In the Universe”, **Harvard University** (Spring 04, 05)
- 2002 Teaching Assistant, **Summer Science Program**, Happy Valley School, Ojai, CA
- 2001 Teaching Assistant, “Introductory Astronomy”, **UC Berkeley** (Fall 2001)
- 1999 Student Instructor, “Science Fiction”, **UC Berkeley** (Spring 1999)

57 SCIENTIFIC PUBLICATIONS

h-index: **19**, g-index: **43** ([NASA/ADS](#)), Citations: **2256**, Top 1st author: **198** ([Google Scholar](#))
 Refereed: **28** (Accepted: **27**, Submitted: **1**), In prep: **3** 1st/2nd author Refereed: **13**, In prep: **3**
 Non-Refereed: **29** (Conference: **2**, Popular: **12**, Circulars: **15**) 1st author non-refereed: **18**

ALTERNATIVE METRICS

- 5 articles since 2014 ([1](#), [2](#), [3](#), [4](#), [5](#)) in top 5% of all research outputs scored by [Altmetric.com](#), each in **97-99th** percentile for High Attention Score compared to outputs of same age and source.
- Articles [1](#), [5](#) among highest scoring outputs (top 0.2% all time) from *Physical Review Letters*.

- 247 online mentions on [Impactstory.org](https://www.impactstory.org). [Top publication](#) saved and shared 98 times (Only 13% of researchers get this much attention).
- Only 8% of researchers this highly Cited in Wikipedia ([1](#), [2](#), [3](#), [4](#)).

REFEREED PAPERS (28)

- 2020 **Friedman, A.S.**, Gerasimov, R., Kislak, F., Leon, D., Stevens, W., Tytler, D., and Keating, B.G., 2020, “Improved Constraints on Anisotropic Birefringent Lorentz Invariance and CPT Violation from Broadband Optical Polarimetry of High Redshift Galaxies”, *submitted* ([arXiv:2003.00647](https://arxiv.org/abs/2003.00647))
- 2019 Avelino, A., **Friedman, A.S.**, Mandel, K.S., Jones, D.O., Challis, P. and Kirshner, R.P. 2019, “Type Ia Supernovae are Excellent Standard Candles in the Near-Infrared”, *the Astrophysical Journal*, Vol 887, id. 106, 33pp. ([arXiv:1902.03261](https://arxiv.org/abs/1902.03261)) ([DOI](#))
- 2019 **Friedman, A.S.**, Leon, D., Crowley, K.D., Johnson, D., Teply, G., Tytler, D., Keating, B.G., and Cole, G.M. 2019, “Constraints on Lorentz Invariance and CPT Violation using Optical Photometry and Polarimetry of Active Galaxies BL Lacertae and S5 B0716+714”, *Physical Review D*, Vol. 99, Issue 3, id. 035045 ([arXiv:1809.08356](https://arxiv.org/abs/1809.08356)) ([DOI](#))
- 2019 **Friedman, A.S.**, Guth, A.H., Hall, M.J.W., Kaiser, D.I., and Gallicchio, J. 2019, “Relaxed Bell Inequalities with Arbitrary Measurement Dependence for Each Observer”, *Physical Review A*, Vol. 99, Issue 1, id. 012121 ([arXiv:1809.01307](https://arxiv.org/abs/1809.01307)) ([DOI](#))
- 2018 Pierel, J. D. R. , Rodney, S., Avelino, A., Bianco, F., Filippenko, A. V., Foley, R. J., **Friedman, A.S.**, Hicken, M., Hounsell, R., Jha, S.W., Kessler, R., Kirshner, R.P., Mandel, K., Narayan, G., Scolnic, D., Strolger, L. 2018, “Extending Supernova Spectral Templates for Next-Generation Space Telescope Observations”, *Publications of the Astronomical Society of the Pacific*, Vol. 130, Issue 993, pp.114504 ([arXiv:1808.02534](https://arxiv.org/abs/1808.02534)) ([DOI](#))
- 2018 Rauch, D., Handsteiner, J., Hochner, A., Gallicchio, J., **Friedman, A.S.**, Leung, C., Liu, B., Bulla, L., Ecker, S., Steinlechner, F., Ursin, R., Hu, B., Leon, D., Benn, C., Ghedina, A., Cecconi, M., Guth, A.H., Kaiser, D.I., Scheidl, T., Zeilinger, A. 2018, “Cosmic Bell Test Using Random Measurement Settings from High-Redshift Quasars”, *Physical Review Letters*, Vol. 121, Issue 8. id. 080403 ([arXiv:1808.05966](https://arxiv.org/abs/1808.05966)) ([DOI](#)) [Editor’s Suggestion]
- 2018 Leung, C., Brown, A., Nguyen, H., **Friedman, A.S.**, Kaiser, D.I., and Gallicchio, J.+2018, “Astronomical random numbers for quantum foundations experiments”, *Physical Review A*, Vol. 97, Issue 4, id. 042120, 15pp ([arXiv:1706.02276](https://arxiv.org/abs/1706.02276)) ([DOI](#)) [Featured in Physics]
- 2017 Hicken, M., **Friedman, A.S.**+ 2017, “Type II Supernova Light Curves and Spectra From the CfA”, *The Astrophysical Journal Supplement Series*, Volume 233, Issue 1, id 6, 11pp ([arXiv:1706.01030](https://arxiv.org/abs/1706.01030)) ([DOI](#))
- 2017 Handsteiner, J., **Friedman, A.S.**+ 2017, “Cosmic Bell Test: Measurement Settings from Milky Way Stars”, *Physical Review Letters*, Vol. 118, Issue 6. id. 060401 ([arXiv:1611.06985](https://arxiv.org/abs/1611.06985)) ([DOI](#)) [Featured in Physics, Editor’s Suggestion]
- 2016 Marion, G.H. + 2016, “SN 2012cg: Evidence for Interaction Between a Normal Type Ia Supernova and a Non-Degenerate Binary Companion”, *The Astrophysical Journal*, Volume 820, Issue 2, id. 92, 16 pp ([arXiv:1507.07261](https://arxiv.org/abs/1507.07261)) ([DOI](#))
- 2015 **Friedman, A.S.** + 2015c, “[CfAIR2: Near-Infrared Light Curves of 94 Type Ia Supernovae](#)”, *The Astrophysical Journal Supplement Series*, Volume 220, Issue 1, id. 9, 35 pp ([arXiv:1408:0465](https://arxiv.org/abs/1408.0465)) ([DOI](#))

- 2014 Fransson, C. + 2014, “[High Density Circumstellar Interaction in the Luminous Type II_n SN 2010jl: The first 1100 days](#)”, *The Astrophysical Journal*, Volume 197, Issue 2, id. 118, 40 pp ([arXiv:1312.6617](#)) ([DOI](#))
- 2014 Bianco, F. + 2014, “[Multi-Color Optical and NIR Light Curves of 64 Stripped-Envelope Core-Collapse Supernovae](#)”, *The Astrophysical Journal Supplements*, Volume 213, Issue 2, Article id. 19, 21 pp. ([arXiv:1405.1428](#)) ([DOI](#))
- 2014 Gallicchio, J., **Friedman, A.S.**, Kaiser, D.I., 2014, “[Testing Bell’s Inequality with Cosmic Photons: Closing the Setting-Independence Loophole](#)”, *Physical Review Letters*, Vol. 112, Issue 11, id. 110405, 5 pp. ([arXiv:1310.3288](#)) ([DOI](#))
- 2014 Marion, G.H. + 2014, “[Type II_b Supernova SN 2011dh: Spectra and Photometry from the Ultraviolet to the Near-Infrared](#)”, *The Astrophysical Journal*, Vol. 781, Issue 2, article id 69, 18 pp. ([arXiv:1303.5482](#)) ([DOI](#))
- 2014 Margutti, R. + 2014, “[A Panchromatic View of the Restless SN 2009ip Reveals the Explosive Ejection of a Massive Star Envelope](#)”, *The Astrophysical Journal*, Vol. 780, Issue 1, article id. 21, 38 pp. ([arXiv:1306.0038](#)) ([DOI](#))
- 2013 **Friedman, A.S.**, Kaiser, D.I., & Gallicchio, J. 2013, “[The Shared Causal Pasts and Futures of Cosmological Events](#)”, *Physical Review D*, Vol. 88, Issue 4, id. 044038, 18 pp. ([arXiv:1305.3943](#)) ([DOI](#))
- 2013 Drout, M. + 2013, “[The Fast and Furious Decay of the Peculiar Type-I Supernova 2005ek](#)”, *The Astrophysical Journal*, Vol. 774, Issue 1, article id. 58, 18 pp. ([arXiv:1306.2337](#)) ([DOI](#))
- 2013 Sanders, N.E. + 2013, “[PS1-12SK is a Peculiar Supernova From a He-Rich Progenitor System in a Brightest Cluster Galaxy Environment](#)”, *The Astrophysical Journal*, Vol. 769, Issue 1, 39, 15 pp. ([arXiv:1303.1818](#)), ([DOI](#))
- 2012 **Friedman, A.S.** 2012, PhD Thesis, Harvard University, “[Infrared Light Curves of Type Ia Supernovae](#)”, *ProQuest Dissertations and Theses*, Pub. #: AAT 3513964; ISBN: 9781267446190; 272 pp. ([NASA/ADS](#))
- 2012 Hicken, M. + 2012, “[CfA4: Light Curves for 93 Type Ia Supernovae](#)”, *The Astrophysical Journal Supplement*, Vol. 200, Issue 2, article id. 12, 15 pp. ([arXiv:1205.4493](#)), ([DOI](#))
- 2009 Mandel, K., Wood-Vasey, W.M., **Friedman, A.S.**, & Kirshner, R.P. 2009, “[Type Ia Supernova Light Curve Inference: Hierarchical Bayesian Analysis in the Near Infrared](#)”, *The Astrophysical Journal*, Vol. 704, Issue 1, pp. 629-651 ([arXiv:0908.0536](#)), ([DOI](#))
- 2009 Modjaz, M. + 2009, “[From Shock Breakout to Peak and Beyond: Extensive Panchromatic Observations of the Type Ib Supernova 2008D Associated with Swift X-ray Transient 080109](#)”, *The Astrophysical J.*, Vol. 702, Issue 1, pp. 226-248 ([arXiv:0805.2201](#)), ([DOI](#))
- 2009 Foley, R. + 2009, “[SN 2008ha: An Extremely Low Luminosity and Exceptionally Low Energy Supernova](#)”, *The Astronomical Journal*, Vol. 138, Issue 2, pp. 376-391 ([arXiv:0902.2794](#)), ([DOI](#))
- 2009 Wang, X. + 2009, “[The Golden Standard Type Ia Supernova 2005cf: Observations from the Ultraviolet to the Near-Infrared Wavebands](#)”, *The Astrophysical Journal*, Vol. 697, Issue 1, pp. 380-408 ([arXiv:0811.1205](#)), ([DOI](#))
- 2008 Wood-Vasey, W.M., **Friedman, A.S.** + 2008, “[Type Ia Supernovae are Good Standard Candles in the Near Infrared: Evidence from PAIRITEL](#)”, *The Astrophysical Journal*, Vol. 689, Issue 1, pp. 377-390 ([arXiv:0711.2068](#)), ([DOI](#))
- 2005 **Friedman, A.S.** & Bloom, J.S. 2005b, “[Present and Future Prospects for GRB Standard Candles](#)”, *Il Nuovo Cimento C*, Vol. 028, Issue 04-05, pp. 669-672 ([astro-ph/0502559](#)),

(DOI)

- 2005 **Friedman, A.S.** & Bloom, J.S. 2005a, “[Toward a More Standardized Candle Using GRB Energetics and Spectra](#)”, *The Astrophysical Journal*, Vol. 627, Issue 1, pp. 1-25 ([astro-ph/0408413](#)), (DOI)

CONFERENCE PROCEEDINGS AND ABSTRACTS (16)

- 2020 **Friedman, A.S.**, Leon, D., Gerasimov, R., Crowley, K.D., Broudy, I., Melkani, Y., Stevens, W., Johnson, D., Teply, G., Tytler, D., Keating, B.G., and Cole, G.M., “[Standard-Model Extension Constraints on Lorentz and CPT Violation From Optical Polarimetry of Active Galactic Nuclei](#)”, *Proceedings of the Eighth Meeting on CPT and Lorentz Symmetry (CPT'19)*, Indiana University, Bloomington, May 12–16, 2019, ed. Ralf Lehnert, *World Scientific*, April 2020, pp. 126-129 ([arXiv:1906.07301](#)) Article: (DOI) Proceedings: (DOI)
- 2020 Kirshner, R. P.; Avelino, A.; Challis, P. J.; **Friedman, A. S.**; Jones, D. O.; Mandel, K. S.; The Raisin Team, “Ripening RAISINS: SN Ia in the IR”, *American Astronomical Society*, AAS meeting #235, id. 412.04.
- 2019 Kirshner, R.P.; Challis, P.; Avelino, A.; Jones, D.; Mandel, K.; **Friedman, A.S.**, “[Results from RAISIN: SNIa in the IR](#)”, *American Astronomical Society*, AAS Meeting #233, id.315.03
- 2018 Avelino, A.; Kirshner, R.P.; Mandel, K.; Challis, P.; **Friedman, A. S.**; RAISIN Team, “[Near Infrared SN Ia Cosmology](#)”, *American Astronomical Society*, AAS Meeting #231, id.209.03
- 2017 Avelino, A.; **Friedman, A. S.**; Mandel, K.; Kirshner, R.P.; Challis, P. “[Near-infrared absolute magnitudes of Type Ia Supernovae](#)”, *American Astronomical Society*, AAS Meeting #229, id.410.02
- 2016 **Friedman, A. S.**; Kaiser, D. I.; Gallicchio, J.; Team 1: University of Vienna, Institute for Quantum Optics and Quantum Information; Team 2: UC San Diego Cosmology Group; Team 3: NASA/JPL/Caltech, “[Testing Quantum Mechanics and Bell's Inequality with Astronomical Observations](#)”, *American Astronomical Society*, AAS Meeting #228, id.403.05
- 2015 **Friedman, A. S.**; Gallicchio, J.; Kaiser, D. I.; Guth, A. H., “[Testing Quantum Mechanics and Bell's Inequality with Astronomical Observations](#)”, *American Astronomical Society*, AAS Meeting #225, id.255.13
- 2014 **Friedman, A. S.**; Gallicchio, J.; Kaiser, D. I.; Guth, A., “[Testing Quantum Mechanics and Bell's Inequality with Cosmological Observations of Quasars](#)”, *American Astronomical Society*, AAS Meeting #224, id.304.02
- 2014 **Friedman, A. S.**; Kaiser, D. I.; Gallicchio, J.; Guth, A. H., “[Testing Quantum Mechanics with Observations of Causally Disconnected Cosmological Events](#)”, *American Astronomical Society*, AAS Meeting #223, id.127.01
- 2010 Mandel, K.; Kirshner, R. P.; Narayan, G.; Wood-Vasey, W. M.; **Friedman, A. S.**; Hicken, M., “[Type Ia Supernova Light Curve Inference: Hierarchical Models for Nearby SN Ia in the Optical and Near Infrared](#)”, *American Astronomical Society*, AAS Meeting #215, id.343.05; *Bulletin of the American Astronomical Society*, Vol. 42, p.449

- 2010 **Friedman, A. S.**; Kirshner, R. P.; Wood-Vasey, M.; Bloom, J. S.; Mandel, K.; Challis, P.; Hicken, M.; Narayan, G.; Foley, R.; Rest, A.; Modjaz, M.; Starr, D.; Blondin, S.; Blake, C.; CfA Supernova Group; PAIRITEL collaboration, “[Infrared Light Curves of Type Ia Supernovae](#)”, American Astronomical Society, AAS Meeting #215, id.343.04; *Bulletin of the American Astronomical Society*, Vol. 42, p.449
- 2009 **Friedman, A. S.**; Wood-Vasey, M.; Mandel, K.; Hicken, M.; Challis, P.; Bloom, J.; Starr, D.; Kirshner, R. P.; Modjaz, M.; CfA Supernova Group; PAIRITEL, “[Disentangling Intrinsic Color Variation and Dust Extinction of Type Ia Supernovae With Near-Infrared, Optical, and Ultraviolet Photometry](#)”, American Astronomical Society, AAS Meeting #213, id.438.06; *Bulletin of the American Astronomical Society*, Vol. 41, p.311
- 2007 **Friedman, A. S.**; Wood-Vasey, W. M.; Bloom, J. S.; Modjaz, M.; Hicken, M.; Kirshner, R. P.; Starr, D.; Blake, C. H.; Falco, E.; Szentgyorgyi, A.; Challis, P.; Blondin, S.; Rest, A.; Skrutskie, M., “[The Absolute Brightness of Type Ia Supernovae in the Near-Infrared from PAIRITEL: Improved Reddening Estimates and Distances](#)”, American Astronomical Society, AAS Meeting #211, id.91.17; *Bulletin of the American Astronomical Society*, Vol. 39, p.886
- 2006 **Friedman, A. S.**; Wood-Vasey, W. M.; Modjaz, M.; Kirshner, R.; Bloom, J. S.; Blake, C. H.; Szentgyorgyi, A. H.; Falco, E. E.; Starr, D.; Skrutskie, M., “[First Two Years: Infrared Light Curves of Type Ia Supernovae with the Peters Automated Infrared Imaging Telescope \(PAIRITEL\)](#)”, 2007 AAS/AAPT Joint Meeting, American Astronomical Society Meeting 209, id.90.06; *Bulletin of the American Astronomical Society*, Vol. 38, p.1026
- 2005 **Friedman, A. S.**; Modjaz, M.; Wood-Vasey, W. M.; Blake, C. H.; Kirshner, R. P.; Challis, P.; Falco, E. E.; Bloom, J. S.; Skrutskie, M. F.; CfA Supernova Group Team; PAIRITEL Collaboration, “[Infrared Light Curves of Nearby Supernovae with the Peters Automated Infrared Imaging Telescope \(PAIRITEL\)](#)”, American Astronomical Society Meeting 207, id.171.05; *Bulletin of the American Astronomical Society*, Vol. 37, p.1432
- 2004 **Friedman, A. S.**, Bloom, J. S, and cosmicbooms.net Team, “[The Present and Future of GRB Cosmography](#)”, American Astronomical Society Meeting 205, id.159.07; *Bulletin of the American Astronomical Society*, Vol. 36, p.1611
- 2000 Li, W. Filippenko, A.V., Treffers, R., **Friedman, A.S.** + 2000, “[The Lick Observatory Supernova Search](#)”, *American Institute of Physics Conference Proceedings*, Vol. 522, pp. 103-106 ([astro-ph/9912336](#)), ([DOI](#))

ASTRONOMICAL NOTICES (15)

- 2012 Marion, G.H. + 2012b, “[Updated Physical Parameters of SN 2012cg](#)”, *The Astronomer's Telegram*, ATEL #4215, 6/2012 ([NASA/ADS](#))
- 2012 Marion, G.H. + 2012a, “[Early Optical and NIR Photometry and Optical Spectroscopy of SN 2012cg](#)”, *The Astronomer's Telegram*, ATEL #4159, 6/2012 ([NASA/ADS](#))
- 2011 Marion, G.H. + 2011, “[Helium Detection in IRTF Spectra of SN 2011dh](#)”, *The Astronomer's Telegram*, ATEL #3435, 6/2011 ([NASA/ADS](#))
- 2008 Challis, P. + 2008, “[Supernova 2008fj in UGC 10759](#)”, *Central Bureau Electronic Telegrams*, 1495, 1, 9/2008 ([NASA/ADS](#))
- 2008 Modjaz, M. + 2008, “[XRB 080109/SN 2008D:PAIRITEL NIR observations and t_0 from Swift.](#)”, *GRB Coordinates Network*, Circular Service, 7175, 1 (2008) ([NASA/ADS](#))

- 2007 Bloom, J.S. + 2007, "[PAIRITEL Monitoring of SN 2007sr](#)", *The Astronomer's Telegram*, ATEL #1343, 12/2007 ([NASA/ADS](#))
- 2006 Blondin, S. + 2006, "[GRB 061201: magellan redshift of nearby Abell cluster.](#)", *GRB Coordinates Network*, Circular Service, 5944, 1 (2006) ([NASA/ADS](#))
- 2001 **Friedman, A.S.**, Li, W.D., Schwartz, M. 2001, "[Supernova 2001ae in IC 4229](#)", *International Astronomical Union (IAU) Circulars*, 7597, 1 (2001) ([NASA/ADS](#))
- 2001 **Friedman, A.S.**, Li, W.D., Chornock, R. 2001, "[Supernova 2001L in MCG -01-30-11](#)", *International Astronomical Union (IAU) Circulars*, 7566, 1 (2001) ([NASA/ADS](#))
- 2000 **Friedman, A.S.**, Li, W.D., Schwartz, M. 2000, "[Supernova 2000fa in UGC 3770](#)", *International Astronomical Union (IAU) Circulars*, 7533, 2 (2000) ([NASA/ADS](#))
- 1999 **Friedman, A.S.**, Li, W.D., Puckett, T. 1999, "[Supernova 1999gb in NGC 2532](#)", *International Astronomical Union (IAU) Circulars*, 7316, 2 (1999) ([NASA/ADS](#))
- 1999 **Friedman, A.S.**, King, J.Y., Li, W.D., Lick Observatory Supernova Search 1999, "[Supernova 1999ej in NGC 495](#)", *International Astronomical Union (IAU) Circulars*, 7286, 1 (1999) ([NASA/ADS](#))
- 1999 **Friedman, A.S.**, Li, W.D. 1999, "[Supernova 1999bx in UGC 11391](#)", *International Astronomical Union (IAU) Circulars*, 7154, 1 (1999) ([NASA/ADS](#))
- 1999 Li, W.-D., Modjaz, M., King, J. Y., Papenkova, M., Johnson, R. A., **Friedman, A.S.**, Treffers, R. R., Filippenko, A. V. 1999, "[Comet 1999 E1](#)", *International Astronomical Union (IAU) Circulars*, 7126, 1 (1999) ([NASA/ADS](#))
- 1999 Modjaz, M., King, J. Y., Papenkova, M., **Friedman, A.S.**, Johnson, R. A., Li, W. D., Treffers, R. R., Filippenko, A. V. 1999, "[Supernova 1999ac in NGC 6063](#)", *International Astronomical Union (IAU) Circulars*, 7114, 1 (1999) ([NASA/ADS](#))

POPULAR SCIENCE ARTICLES (12)

- 2020 **Friedman, A.S.** 2020, [Ask Astro: Does the space inside an atom expand with the universe?](#), *Astronomy*, Apr 2020, pg. 70
- 2017 **Friedman, A.S.** 2017a, [Make the Cosmic Perspective Your Next Coping Mechanism](#), *Nautilus, Facts So Romantic: On Ideas*, Nov 7 2017
- 2015 **Friedman, A.S.** 2015b, [Are the Quantum World and the Real World the Same Thing?](#), *NOVA Physics Blog: The Nature of Reality*, May 7 2015
- 2015 **Friedman, A.S.** 2015a, [Ask Astro: Could quantum entanglement be a result of the big bang?](#), *Astronomy*, Vol. 43, Issue 5, May 2015, pg. 44-45
- 2014 **Friedman, A.S.** 2014d, [Can the Cosmos Test Quantum Entanglement?](#), *Astronomy*, Vol. 42, Issue 10, October 2014, pg. 28-33
- 2014 **Friedman, A.S.** 2014c, [Web Extra: Another cosmic thought experiment](#), *Astronomy*, Vol. 42, Issue 10, October 2014
- 2014 **Friedman, A.S.** 2014b, [Heart of a Star, Revealed](#), *Rune: The MIT Journal of Arts and Letters*, Issue 35, pg. [20-21](#)
- 2014 **Friedman, A.S.** 2014a, [The Universe Made Me Do It? Testing "Free Will" With Distant Quasars](#), *NOVA Physics Blog: The Nature of Reality*, Mar 9 2014
- 2006 **Friedman, A.S.** 2006, [Using GRBs For Cosmology](#), p35 (with Naeye, R.S., [Dissecting the Bursts of Doom](#), *Sky & Telescope*, Volume 112, No. 8, p30-37, 2006)
- 2002 **Friedman, A.S.** 2002, [The Fundamental Distinction Between Brains and Turing Machines](#), *Berkeley Scientific Journal*, Vol. 6, Issue 1, Spring 2002, p. 28-33

- 2001 **Friedman, A.S.** 2001b, [Fundamental Constants of Physics: The Genes of the Universe](#), *Berkeley Scientific Journal*, Vol. 5, Issue 2, Fall 2001, p. 100-104
- 2001 **Friedman, A.S.** 2001a, [The Fabric of Reality](#), *Berkeley Scientific Journal*, Vol. 5, Issue 1, Spring 2001, p. 28-30

INVITED TALKS

- 2019 A Cosmic Test of Quantum Entanglement, Summer Science Program Guest Lecture, **UC San Diego**, 7/19/19
- 2019 Constraints on Lorentz Invariance and CPT Violation using Optical Polarimetry of Active Galaxies, Eighth Meeting on CPT and Lorentz Symmetry, **Indiana University, Bloomington**, 5/15/19
- 2019 Constraints on Lorentz Invariance and CPT Violation using Optical Polarimetry of Active Galaxies, Center for Astrophysics & Space Sciences, **UC San Diego**, 5/10/19
- 2019 [A Cosmic Test of Quantum Entanglement and Bell's Inequality: Choosing Measurements with Light from High Redshift Quasars](#), [Astrophysics Seminar](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 4/10/19
- 2019 [A Cosmic Test of Quantum Entanglement and Bell's Inequality: Choosing Measurements with Light from High Redshift Quasars](#), [Brown Bag Lunch Talk](#), Kavli Institute for Astrophysics and Space Research, **MIT**, 3/18/19
- 2019 [Behind the Scenes: Einstein's Quantum Riddle: Special PBS NOVA Screening and Panel Discussion](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 3/4/19
- 2018 [A Cosmic Test of Quantum Entanglement: Choosing Experimental Bell Inequality Measurements with Light from High Redshift Quasars](#), Physics and Astronomy Colloquium, **San Diego State University**, 11/30/18
- 2017 [A Cosmic Test of Quantum Entanglement](#), [Summer Science Program](#), Summer Science Program Guest Lecture, **New Mexico Tech**, 7/12/17
- 2017 [A Cosmic Bell Test with Measurement Settings from Milky Way Stars](#), Astrophysics Seminar, Center for Astrophysics & Space Sciences, **UC San Diego**, 3/8/17
- 2016 [Math, Science, and the Mind of God](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 8/10/16
- 2016 [Math, Science, and the Mind of God](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 8/3/16
- 2016 [Testing Quantum Mechanics and Bell's Inequality with Astronomical Observations](#), **American Astronomical Society**, Meeting #228, San Diego, CA, 6/16/16
- 2016 [Testing Quantum Mechanics and Bell's Inequality with Astronomical Observations](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 6/7/16
- 2015 [Comparing Recent Entanglement Tests to a Cosmic Bell Test: Loopholes & Spacetime Diagrams](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 12/18/15
- 2015 [Cosmic Bell: Testing Quantum Mechanics and Bell's Inequality with Astrophysical Observations](#), [Summer Science Program Alumni Dinner](#), **MIT Media Lab**, Cambridge, MA 11/14/15
- 2015 Optimal Source Selection for a Cosmic Bell Experiment, Institute for Quantum Optics & Quantum Information, **University of Vienna**, 10/1-2/15
- 2015 [The Physics of Free Will](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 8/6/15
- 2015 [The Physics of Free Will](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 8/5/15

- 2015 [Cosmic Bell: Testing Quantum Mechanics and Bell's Inequality with Astrophysical Observations](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 7/1/15
- 2014 [How Big Is The World? Exploring the Multiverse in Modern Astrophysics, Cosmology, and Beyond](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 7/29/14
- 2014 [How Big Is The World? Exploring the Multiverse in Modern Astrophysics, Cosmology, and Beyond](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 7/16/14
- 2014 [Testing Quantum Mechanics and Bell's Inequality with Cosmological Observations of Quasars](#), **American Astronomical Society**, Meeting #224, Boston, MA, 6/4/14
- 2014 [Testing Quantum Mechanics and Bell's Inequality with Cosmological Observations](#), Brown Bag Lunch Talk, Kavli Institute for Astrophysics & Space Research, **MIT**, 3/10/14
- 2014 [Testing Quantum Mechanics and Bell's Inequality with Cosmological Observations](#), Philosophy of Physics Group, Department of Philosophy, **UC San Diego**, 2/20/14
- 2014 [Testing Quantum Mechanics and Bell's Inequality with Observations of Causally Disconnected Cosmological Events](#), Institute for Theory and Computation, **Harvard-Smithsonian CfA**, 1/13/14
- 2013 [Testing Quantum Mechanics and Bell's Inequality with Observations of Causally Disconnected Cosmological Events](#), Tufts/MIT Cosmology Seminar, **MIT Center for Theoretical Physics**, 11/19/13
- 2013 [The Shared Causal Pasts and Futures of Cosmological Events](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 6/19/13
- 2013 [Infrared Photometric Uncertainties with the PAIRITEL 1.3-m Telescope](#), Center for Astrophysics & Space Sciences, **UC San Diego**, 1/2/13
- 2012 [CfAIR2: 100 Type Ia Supernovae Light Curves From PAIRITEL](#), Special Astro. Seminar, Center for Astrophysics & Space Sciences, **UC San Diego**, 6/19/12
- 2012 [CfAIR2: Infrared Observations of ~100 Type Ia Supernovae With PAIRITEL](#), A PITT PACC Workshop, Dept. of Physics & Astronomy, **U. of Pittsburgh**, 3/28/12
- 2012 [CfAIR2: Infrared Observations of ~100 Type Ia Supernovae With PAIRITEL](#), Optical and Infrared Seminar, **Harvard-Smithsonian Center for Astrophysics**, 2/22/12
- 2011 [Rescuing Type Ia Supernovae From Dust: Bayesian Inference With Near-Infrared and Optical Data](#), Philosophy of Cosmology Workshop and Logic, Mathematics, & Physics Graduate Conference Panelist, Rotman Institute, **University of Western Ontario**, 5/7/11
- 2010 [Infrared Light Curves of Type Ia Supernovae](#), **American Astronomical Society**, Meeting #215, Washington, DC, 1/5/10
- 2007 [Infrared Light Curves of Type Ia Supernovae from PAIRITEL](#), Accretion and Explosion: The Astrophysics of Degenerate Stars, Kavli Institute for Theoretical Physics, **UC Santa Barbara**, 2/20/07
- 2006 [Selected PAIRITEL Data Analysis Issues](#), 2nd PAIRITEL Workshop, **Harvard-Smithsonian Center for Astrophysics**, 6/16/06
- 2006 [The Promise and Limitations of GRB Standard Candles](#), Graduate Student Research Forum, Dept. of Astronomy, **Harvard University**, 3/14/06
- 2005 [The Present and Future of GRB Cosmology](#), Supernova Acceleration Probe Science Meeting, **Lawrence Berkeley National Laboratory**, 7/15/05
- 2005 [Toward a More Standardized Candle Using GRB Energetics and Spectra](#), High Energy Astrophysics Division Lunch Talk, **Harvard-Smithsonian CfA**, 2/9/05
- 2005 [The Present and Future of GRB Cosmography](#), **American Astronomical Society**, Meeting #205, San Diego, CA, 1/13/05

POSTER PRESENTATIONS

- 2018 [Testing Quantum Entanglement with Astronomical Observations](#) and Type Ia Supernovae are Excellent Standard Candles in the Near-Infrared, “Adventures in Astrophysics: A Symposium Celebrating Alex Filippenko's 60th Birthday”, Aptos, CA, **UC Berkeley**, 8/15-8/18/2018
- 2014 [Testing Quantum Mechanics and Bell's Inequality with Astronomical Observations](#), “2nd Annual MIT Postdocs Share Their Science Poster Session”, **MIT**, 5/12/14
- 2009 [Disentangling Dust Extinction and Intrinsic Color Variation of Type Ia Supernovae With Near-Infrared and Optical Photometry](#), “RogerFest: A Festival of Cosmic Explosions”, Cahill Center, **Caltech**, 8/21-23/09
- 2009 [Disentangling Dust Extinction and Intrinsic Color Variation of Type Ia Supernovae With Near-Infrared and Optical Photometry](#), “Stellar Death & Supernovae, Kavli Institute for Theoretical Physics”, **UC Santa Barbara**, 8/17-21/09
- 2009 [Disentangling Intrinsic Color Variation and Dust Extinction of Type Ia Supernovae With Near-Infrared, Optical, and Ultraviolet Photometry](#), **American Astronomical Society**, Meeting #213, Long Beach, CA, 1/9-14/09
- 2008 [Type Ia Supernovae are Good Standard Candles in the Near Infrared: Evidence from PAIRITEL](#), **American Astronomical Society**, Meeting #211, Austin, TX, 1/7-11/08
- 2007 [The Absolute Brightness of Type Ia SNe in the NIR from PAIRITEL: Implications for the NASA/DOE Joint Dark Energy Mission](#), “NASA Graduate Student Research Program Symposium”, **NASA Goddard Space Flight Center**, Greenbelt, MD, 9/19-21/07
- 2006 [Infrared Light Curves of Nearby Supernovae with the Peters Automated Infrared Imaging Telescope \(PAIRITEL\)](#), **American Astronomical Society**, Meeting #207, Washington, DC, 1/8-12/06
- 2004 [Toward a More Standardized Candle Using GRB Energetics and Spectra](#), “4th Workshop on Gamma-Ray Bursts in the Afterglow Era”, **Rome, Italy**, 10/18-22/04

CONFERENCES AND WORKSHOPS

- 2019 Eighth Meeting on CPT and Lorentz Symmetry, **Indiana University**, Bloomington, 5/12-5/15/19
- 2019 “Cosmic Bell US Collaboration Meeting”, Center for Theoretical Physics and Department of Physics, **MIT**, 3/2019
- 2018 “Adventures in Astrophysics: A Symposium Celebrating Alex Filippenko's 60th Birthday”, Aptos, CA, **UC Berkeley**, 8/15-8/18/2018
- 2016 **American Astronomical Society**, Meeting #228, San Diego, CA, 6/12-6/16
- 2015 “Cosmic Bell team workshop”, Institute for Quantum Optics & Quantum Information, **University of Vienna**, 9/30-10/4/15
- 2014 **American Astronomical Society**, Meeting #224, Boston, MA, 6/1-6/5
- 2013 “Institute for the Philosophy of Cosmology”, **UC Santa Cruz**, 6/23-7/14
- 2012 “Type Ia Supernovae in the Near-Infrared: A PITT PACC Workshop”, Department of Astronomy, **University of Pittsburgh**, 3/28-30/2012
- 2011 **American Astronomical Society**, Meeting #218, Boston, MA, 5/22-26/11
- 2011 “Logic, Mathematics & Physics Graduate Conference: Topics in the Philosophy of Cosmology panel”, Rotman Institute, **University of Western Ontario**, 5/7-9/11

- 2011 “Philosophy of Cosmology Workshop”, Rotman Institute, **University of Western Ontario**, 5/6-7/11
- 2010 **American Astronomical Society**, Meeting #215, Washington, DC, 1/3-7/10
- 2009 “RogerFest: A Festival of Cosmic Explosions”, Cahill Center, **Caltech**, 8/21-23/09
- 2009 “Stellar Death & Supernovae, Kavli Institute for Theoretical Physics”, **UC Santa Barbara**, 8/17-21/09
- 2009 **American Astronomical Society**, Meeting #213, Long Beach, CA, 1/9-14/09
- 2008 **American Astronomical Society**, Meeting #211, Austin, TX, 1/7-11/08
- 2007 “NASA Graduate Student Research Program Symposium”, **NASA Goddard Space Flight Center**, Greenbelt, MD, 9/19-21/07
- 2007 “Accretion and Explosion: The Astrophysics of Degenerate Stars”, Kavli Institute for Theoretical Physics, **UC Santa Barbara**, 2/20/07
- 2007 **American Astronomical Society**, Meeting #209, Seattle, WA, 1/5-10/07
- 2006 “NASA Graduate Student Research Program Symposium”, **NASA Goddard Space Flight Center**, Greenbelt, MD, 9/18-22/06
- 2006 “Penn State Summer School in Astrostatistics”, **Pennsylvania State University**, 6/6-10/06
- 2006 **American Astronomical Society**, Meeting #207, Seattle, WA, 1/8-12/06
- 2005 **American Astronomical Society**, Meeting #205, Seattle, WA, 1/9-13/05
- 2003 **American Astronomical Society**, Meeting #201, Seattle, WA, 1/5-9/2003
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OTHER POSITIONS

- 2017 – Affiliated Research Scientist, Arthur C. Clarke Center for Human Imagination, **UC San Diego**
- 2014-16 Visiting Scholar, Center for Astrophysics & Space Sciences, **UC San Diego**
- 2013 Invited Scholar, Institute for the Philosophy of Cosmology, **UC Santa Cruz**

PROFESSIONAL SOCIETIES & SERVICES

- 2014 – Manuscript Referee: *The Astrophysical Journal*
- 2004 – Manuscript Referee: *The Astronomical Journal*
- 2004 – Manuscript Referee: *Journal of Cosmology & Astroparticle Physics*
- 2002 – Member, *American Astronomical Society*
- 2002 – Member, *American Association for the Advancement of Science*
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OUTREACH

PUBLIC TALKS

- 2019 [Behind the Scenes: Einstein’s Quantum Riddle: Special PBS NOVA Screening and Panel Discussion](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 3/4/19
- 2017 [A Cosmic Test of Quantum Entanglement](#), Summer Science Program Guest Lecture, **New Mexico Tech**, 7/12/17
- 2016 [Math, Science, and the Mind of God](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 8/10/16
- 2016 [Math, Science, and the Mind of God](#), Center for Astrophysics and Space Sciences, **UC San Diego**, 8/3/16

- 2015 [Cosmic Bell: Testing Quantum Mechanics and Bell's Inequality with Astrophysical Observations](#), Summer Science Program Alumni Dinner, **MIT Media Lab**, 11/14/15
- 2015 [The Physics of Free Will](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 8/6/15
- 2014 [How Big Is The World? Exploring the Multiverse in Modern Astrophysics, Cosmology, and Beyond](#), Arthur C. Clarke Center for Human Imagination, **UC San Diego**, 7/29/14
- 2012 [CfAIR2: Infrared Observations of ~100 Type Ia Supernovae With PAIRITEL](#), Ph.D. Thesis Talk, Harvard/CfA Optical & Infrared Seminar, **Harvard University**, 2/22/12
- 2008 [Our Place in Space](#), Dudley House Crosstalk Series, (with Jason Gallicchio), **Harvard University**, 3/6/08
- 2006 [Measuring Cosmic Expansion and Acceleration with Supernovae and Gamma-Ray Bursts](#), Guest Lecture, **Summer Science Program**, Ojai, CA, 7/3/06
- 2005 The Coolest Things In Astronomy: II, Guest Lecture, The Math Circle, **Northeastern University**, 12/10/05
- 2005 [Your Place in the Cosmos: From Planets to Stars to Galaxies and Beyond](#), Dudley House Crosstalk Series, (with Ryan Hickox), **Harvard University**, 12/8/05
- 2005 [White Dwarfs, Neutron Stars, Black Holes, Supernova Explosions, and the Origins of Humanity](#), Guest Lecture, “Cosmic Connections”, **Harvard University**, 11/7/05
- 2005 The Coolest Things In Astronomy, Guest Lecture, The Math Circle, **Northeastern University**, 5/22/05

PODCASTS

- 2020 [Break It Down Show](#) podcast, [Dr Andrew Friedman – Quantum Physics and Religion](#), with hosts Pete Turner and Scott Huesing, Feb 7 2020
- 2019 [TMO Background Mode](#) podcast, [Cosmologist Dr. Andrew Friedman #2 – TMO Background Interview](#), with host [John Martellaro](#), [The Mac Observer](#), Dec 23 2019
- 2019 [The People Behind the Science](#) podcast, [533: Dr. Andrew Friedman: Using Astrophysics to Unravel the Enigma of Quantum Entanglement](#), with host Dr. Marie McNeely, Dec 23 2019
- 2019 [Into the Impossible](#) podcast, [E25: A Discussion of Quantum Theory and the Book What Is Real](#), by Adam Becker with [Prof. Chip Sebens \(UCSD Philosophy\)](#), [Dr. Andrew Friedman \(UCSD Physics / CASS\)](#), and author [Adam Becker](#), Host: [Patrick Coleman](#) (Intro: [Stuart Volkow](#)), [UCSD](#), [Arthur C. Clarke Center for Human Imagination](#), June 25 2019 [[YouTube](#)] [[ApplePodcasts](#)]
- 2019 [Break It Down Show](#) podcast, “[Andrew Friedman - Einstein’s Natural World Bows to the Cosmic Bell](#)”, with hosts Pete Turner and Paul Dimech, July 8 2019
- 2019 [TMO Background Mode](#) podcast, [Interview with Cosmologist Dr. Andrew Friedman](#), with host [John Martellaro](#), [The Mac Observer](#), June 12 2019
- 2019 [Planetary Radio](#) podcast, [Quasars and Quanta: Exploring Einstein's Quantum Riddle](#), with Jason Gallicchio, Brian Keating, David Brin, and host [Mat Kaplan](#), [The Planetary Society UCSD](#), [Arthur C. Clarke Center for Human Imagination](#), San Diego, CA, June 12 2019)
- 2018 [Break It Down Show](#) podcast, “[Andrew Friedman – Scientific Method](#)”, with hosts Pete Turner and David West, November 1 2018
- 2018 [Break It Down Show](#) podcast, “[Andrew Friedman – Cornering Quantum Physics Part 1](#)”, with hosts Pete Turner and David West, October 30 2018

- 2014 [Do We Live in A Multiverse?](#), Guido Meyer interview, *IQ*, Bavarian Public Radio, Germany, 6/2/14
- 2006 Gamma-Ray Bursts (GRBs): Andrew Friedman, Astronomy Q & A Podcast series, *Harvard-Smithsonian Center for Astrophysics Science Media Group*, Robert Naeye Interview, Senior Editor of Sky & Telescope Magazine, 5/10/06
- 2005 Temporary Autonomous Zones: Dialogue with an Astrophysicist, San Diego radio DJ Onto the Ontologist Interview, *American Astronomical Society* Meeting #205, 1/10/05

PUBLIC ENGAGEMENT

- 2019 [San Diego Comic-Con International](#) Panel Discussion, “[The Year In Space and Beyond](#)”, with Brian Keating, Shelley Wright, moderated by Stewart Volkow, July 20 2019 [[UCSD Physical Sciences](#)]
- 2019 [Einstein’s Quantum Riddle: Special PBS NOVA Screening and Panel Discussion](#), with Jason Gallicchio, Brian Keating, and David Brin, *UC San Diego Arthur C. Clarke Center for Human Imagination*, Mar 4 2019
- 2019 [Einstein’s Quantum Riddle, Special NOVA Screening and Panel, Harvey Mudd College](#), Feb 4 2019 (led by Jason Gallicchio, HMC)
- 2019 [Einstein’s Quantum Riddle](#), TV Documentary, directed by Jamie Lochhead, *PBS NOVA*, WGBH Boston, Season 46, Episode 2, Jan 9, 2019 [[TV Schedule](#)] [[Free Streaming](#)] [[Amazon Prime](#)] [[Teaser Trailer](#)] [[Buy DVD](#)] [[Amazon DVD](#)]
- 2017 [Cosmic Bell: Exploring Quantum Weirdness](#), *MIT Museum* [[Video](#)], Mar-Sep 2017
- 2016-17 Cosmic Bell Experiment Workshop, *MIT Museum’s Compton Studio*, Sep 16-Feb 17
- 2016 [Fleet Night of Science](#) Volunteer, “Time Travel”, San Diego Comic-Con After Party, Ruben H. Fleet Science Center, 7/21/16
- 2014 Science Consultant, [Video: Do We Live in a Multiverse?](#), by Charles Q. Choi and Greg Kestin, *NOVA*, PBS, WGBH Boston, 9/24/14
- 2014 Science Consultant, [What is Gravity Made Of?](#), by Greg Kestin, *NOVA*, PBS, WGBH Boston, 5/8/14
- 2014 [Heart of a Star, Revealed](#), Art of Astrophysics Contest, *MIT Kavli Institute for Astrophysics & Space Sciences*, 1/31/14
- 2013 [Science Consultant](#) for television series *Wilfred* on FX, Starring Elijah Wood, 8/13
- 2013 Created [animations to visualize current project](#), basis for MIT Museum Exhibit

SELECTED MEDIA COVERAGE

- 2020 [Author Q&A: David Kaiser on physics and its history](#), by Melinda Baldwin, *Physics Today*, Apr 16 2020 [[PDF](#)]
- 2019 [The World As Will and Quantum Mechanics](#), *The Philosophical Salon: A Los Angeles Review of Books Channel*, by Benjamin Winterhalter, Jul 22 2019 [[PDF](#)]
- 2019 [The First Ever Photo Of ‘Spooky’ Quantum Entanglement Was Just Released](#), by Anna Harnes, *Inquisitr*, Jul 7 2019 [[PDF](#)]
- 2019 [A ‘spooky’ effect of physics that Einstein couldn’t believe has been photographed for the first time](#), by Dave Mosher, *MSN*, Jul 7 2019 [[PDF](#)]
- 2019 [Seeing the quantum](#), by Rebecca Holmes, *Aeon*, Apr sy24 2019
- 2019 [HMC Physicists CO-star with Quasars](#), *Harvey Mudd College Magazine*, pg 13, Spring 2019, [[PDF](#)]

- 2019 [Researchers Limit Experimental Free Will to Fake Quantum Entanglement](#), by Cynthia Dillon, *UCSD Physical Sciences News*, Feb 4 2019 [PDF]
- 2019 [Researchers limit experimental Free Will to fake Quantum Entanglement](#), by Cynthia Dillon, *Newswise*, Feb 1 2019 [PDF]
- 2019 [Humans can intuit quantum physics](#), by Nicole Yunger Halpern, *Quantum Frontiers*, Jan 27, 2019 [PDF]
- 2019 [Einstein's Quantum Riddle](#), TV Documentary, directed by Jamie Lockhead, *PBS NOVA*, WGBH Boston, Season 46, Episode 2, Jan 9, 2019 [TV Schedule] [Free Streaming] [Amazon Prime] [Teaser Trailer] [Buy DVD] [Amazon DVD]
- 2018 [Photons, Quasars and the Possibility of Free Will](#), by Brian Koberlein, *Scientific American*, Nov 21, 2018 [PDF]
- 2018 [Einstein was wrong: Why 'normal' physics can't explain reality](#), by Anil Ananthaswamy, *New Scientist*, Nov 17 2018 [PDF]
- 2018 [The quest to test quantum entanglement](#), by Laura Dattaro, *Symmetry Magazine*, November 6 2018 [PDF]
- 2018 [Cosmic Bell Test of Entanglement Using Distant Quasars](#), *Deep Astronomy*, YouTube channel, by Tony Darnell, Sep 8 2018
- 2018 [Physicists race to demystify Einstein's 'spooky' science](#), by Cynthia Dillon, *Phys.org*, Aug 27 2018 [PDF]
- 2018 [Black Holes Bolster Case For Quantum Physics' Spooky Action](#), by Jake Parks, *Discover Magazine, D-Brief*, Aug 23 2018 [PDF]
- 2018 [Quantum entanglement loophole quashed by quasar light](#), by Jake Parks, *Astronomy Magazine*, Aug 23 2018 [PDF]
- 2018 [Closing a loophole in Bell's theorem with light from ancient quasars](#), *Astronomy Now*, Aug 21 2018 [PDF]
- 2018 [Ancient Quasars Provide Incredible Evidence for Quantum Entanglement](#) by Chelsea Gohd, *Space.com*, Aug 21 2018 [PDF] [MIT News Clips] [Live Science (repost)] [Science Alert (repost)] [ESIST (repost)] [Brinkwire (repost)]
- 2018 [Cosmic Bell test uses light from ancient quasars](#), by Hamish Johnston, *Physics World*, Aug 21 2018 [PDF]
- 2018 [Ancient Starlight Just Helped Confirm the Reality of Quantum Entanglement](#) by Daniel Oberhaus, *Motherboard (Vice)*, Aug 21 2018 [PDF] [MIT News Clips]
- 2018 ['Spooky' Quantum Entanglement Confirmed Using Distant Quasars](#) by Ryan F. Mandelbaum, *Gizmodo*, Aug 21 2018 [PDF] [i09] [UK] [Australia] [MIT News Clips]
- 2018 [Old Light Confirms Quantum Entanglement](#) by Editorial Staff, *University of Vienna*, Aug 21 2018 [PDF] [Original German]
- 2018 [Quantum Entanglement Confirmed With Light From Distant Quasars](#), *Harvey Mudd College News*, Aug 22 2018 [PDF]
- 2018 [Light from ancient quasars helps confirm quantum entanglement](#), by editor@science360.gov, *NSF Science 360 News*, Aug 20 2018 [PDF]
- 2018 [Quantum Entanglement Confirmed with Light from Distant Quasars](#) by Sven Hartwig, *Austrian Academy of Sciences*, Aug 20 2018 [PDF] [IQOQI] [Original German]
- 2018 [Physicists Race to Demystify Einstein's 'Spooky' Science](#) by Cynthia Dillon, *UC San Diego News Center*, Aug 20 2018 [PDF] [UCSD News Main Page]
- 2018 [Light from ancient quasars helps confirm quantum entanglement](#), *NSF News from the Field*, Aug 19 2018

- 2018 [Light from ancient quasars helps confirm quantum entanglement](#) by Jennifer Chu, *MIT News Office*, Aug 19 2018 [PDF] [MIT News Clips]
- 2018 [Closed Loophole Confirms the Unreality of the Quantum World](#) by Anil Ananthaswamy, *Quanta Magazine*, Jul 25 2018 [PDF] [reprinted in *WIRED* as [Loopholes and the 'Anti-Realism' of the Quantum World](#) Aug 5 2018] [PDF]
- 2018 Into the Impossible Podcast: Episode 20:, with Adam Becker and Charles Sebens, *UC San Diego Arthur C. Clarke Center for Human Imagination*, 2018 TBA
- 2018 [God's Last Loophole](#), by Robert Gast, *Spektrum.de*, Apr 25 2018 [PDF] ([Original German \[PDF\]](#))
- 2018 [Physics Paper Delves Inside the Box](#), *Harvey Mudd College News*, Apr 24 2018
- 2018 [Synopsis: Random Bit Stream from Cosmic Light](#), Michael Schirber, *APS Physics: News and Commentary*, Apr 24 2018
- 2017 [Fourth HMC Alumnus Wins National Physics Award](#), by Kristine Chang, *The Student Life: The Newspaper of the Claremont Colleges*, Nov 10 2017 [PDF]
- 2017 [Love, quantum physics and 'entanglement'](#), Ari Daniel and Peter Thomson, *PRI (Public Radio International)*, July 25 2017
- 2017 [Cosmic Bell Experiment](#), *MIT Museum*, July 18 2017
- 2017 [Local realism is dead, long live local realism?](#), Rebecca Holmes, *Physics World*, June 2017
- 2017 [A Cat, a Game Show, and a Ball of Yarn: A Play about Quantum Physics](#), Kate Repantis, *Slice of MIT*, Alumni Life, Campus Culture, Events, Modern Geekhood, Science, May 17 2017
- 2017 [Stars as random number generators could test foundations of physics](#), Lisa Zyga, *Phys.org*, May 16 2017
- 2017 [NEW RESULTS! Cosmic Quantum Bell Test](#), Dianna Cowern, *Physics Girl*, May 11 2017
- 2017 [Starlight Puts Quantum Mechanics to the Test](#), Rachel Gaal, *APS News*, Research News: Editor's Choice, Mar 2017 (Volume 26, Number 3)
- 2017 [Starlight Closes Loophole](#), *Physics World*, Mar 2017
- 2017 [Starlight Puts Quantum Mechanics to the Test](#), *APS Physics*, Research News: Editor's Choice, Feb 28 2017, Physics 10, 22
- 2017 [Saved by the Bell](#), Emily Conover, *Science News*, Comments, Feb 22 2017
- 2017 [THUNK - 112. Quantum Entanglement & the Cosmic Bell Test](#), Josh Pelton, *THUNK*, Feb 21 2017
- 2017 [A 600-year-old quantum experiment in the stars](#), Cathal O'Connell, *Cosmos Magazine*, Feb 17 2017
- 2017 [Starlight-controlled entanglement experiment makes shared history unlikely](#), Chris Lee, *Ars Technica*, Feb 16 2017
- 2017 [How to Tame Quantum Weirdness](#), Pradeep Mutalik, *Quanta Magazine*, Feb 16 2017
- 2017 [600-Year-Old Starlight Bolsters Einstein's 'Spooky Action at a Distance'](#), Calla Cofield, *CBS News*, Feb 13 2017 [reprinted from [Space.com](#)]
- 2017 [600-Year-Old Starlight Bolsters Einstein's 'Spooky Action at a Distance'](#), Calla Cofield, *Space.com*, Feb 13 2017
- 2017 [Cosmic Bell Test: Measurement Settings from Milky Way Stars](#), *Physical Review Letters*, Highlighted Articles, Featured in Physics, Editor's Suggestion, Feb 10 2017
- 2017 [The Universe Is as Spooky as Einstein Thought](#), Natalie Wolchover, *The Atlantic*, Feb 10 2017 (reprinted from [Quanta magazine](#))

- 2017 [Quantum Entanglement For the First Time Confirmed by Starlight](#), *Austrian Academy of Sciences*, Feb 8 2017 [[Original German](#)]
- 2017 [Quantum Loopholes And The Problem Of Free Will](#), Chad Orzel, *Forbes*, Feb 8 2017
- 2017 [Flash Physics: Starlight closes Bell test loophole...](#), Sarah Tesh, *physicsworld.com*, Feb 8 2017
- 2017 [Both/And in “Love and Other Entanglements” at the MIT Museum](#), Patrick Gabridge, Feb 7 2017
- 2017 [Sky is no Limit for Quantum Researchers](#), *Harvey Mudd College News*, Feb 7 2017
- 2017 [Quantum Theory by Starlight](#), David Kaiser, *The New Yorker*, Feb 7 2017
- 2017 [Experiment Reaffirms Quantum Weirdness](#), Natalie Wolchover, *Quanta Magazine*, Feb 7 2017
- 2017 [Quantum Physics Tells Us Our Fate Is Not Written in the Stars](#), Brian Koberlein, *Forbes*, Feb 7 2017
- 2017 [Starlight test shows quantum world has been weird for 600 years](#), Leah Crane, *New Scientist*, Feb 7 2017
- 2017 [Synopsis: Cosmic Test of Quantum Mechanics](#), Katherine Wright, *APS Physics*, Feb 7 2017
- 2017 [Physicists address loophole in tests of Bell's inequality using 600-year-old starlight](#), Jennifer Chu, *Phys.org*, Feb 7 2017 [reprinted from [MIT News Office](#)]
- 2017 [Stars align in test supporting “Spooky action at a distance”: Physicists address loophole in tests of Bell's inequality, using 600-year-old starlight](#), Jennifer Chu, *MIT News Office*, Feb 7 2017
- 2017 [Stars align in test supporting 'spooky action at a distance'](#), *NSF News From the Field*, Feb 6 2017
- 2017 [Cosmic Test Bolsters Einstein's “Spooky Action at a Distance”](#), Elizabeth Gibney, *Scientific American*, Feb 3 2017 [reprinted from [Nature News](#)]
- 2017 [Cosmic test backs ‘quantum spookiness’](#), Elizabeth Gibney, *Nature News*, Feb 2 2017 [[Scientific American](#)]
- 2016 [Big Bell Test: Quantum Research Using Laymen](#), Oliver Morsch, *Neue Zurcher Zeitung: NZZ* (Switzerland), Dec 8 2016 [[Original German](#)]
- 2016 [Cosmic Test Confirms Quantum Weirdness](#), Emily Conover, *Science News*, Dec 5 2016
- 2016 [Cosmic experiment is closing another Bell test loophole](#), Andrew Grant, *Physics Today*, Points of View: Extra Dimensions, Dec 1 2016
- 2016 [First Discovery of a Binary Companion for a Type Ia Supernova](#), Christine Pulliam, *Harvard-Smithsonian Center for Astrophysics*, Release No. 2016-07, Mar 22 2016
- 2016 [First Discovery of a Binary Companion for a Type Ia Supernova](#), Rebecca Johnson, *University of Texas at Austin, McDonald Observatory*, 22 Mar 2016
- 2016 [Un Satellite Pour Tester La Physique Quantique](#), David Fosse, *Ciel & Espace* (France) 546, Mars-Avril 2016, pg. 44-49
- 2015 [I ♥ PHYSICS: A LOVE STORY: An Amateur Critique of String Theory](#), Benjamin Winterhalter, *JSTOR Daily*, 12/26/15
- 2015 [Viewpoint: Closing the Door on Einstein and Bohr’s Quantum Debate](#), Alain Aspect, *APS Physics*, American Physical Society, 12/16/15
- 2015 [Is the Cosmos Random?](#), George Musser, *Scientific American*, 313, 88-93, September 2015
- 2015 [Sorry Einstein. Quantum Study Suggests ‘Spooky Action’ Is Real](#), John Markoff, *New York Times, Sunday Review*, 11/14/14

- 2014 [Is Quantum Entanglement Real?](#), David Kaiser, *New York Times, Sunday Review*, 11/14/14
- 2014 [Cosmic Test For Quantum Physics' Last Major Loophole](#), Bruce Dorminey, *Forbes*, 6/18/14
- 2014 [Bell's Theorem: Closing the Loopholes](#), Iulia Georgescu, *Nature Physics, News & Views*, 4/1/14
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- 2019 – [Bell's Theorem](#)
- 2017 – [The Einstein-Podolsky-Rosen Argument in Quantum Theory](#)

MENTORING AND ADVISING

- 2019 – Physics undergraduate student (recently graduated from UCSD), *Walker Stevens*, **UCSD Physics/CASS**
- 2018 – Physics graduate student *Roman Gerasimov* with Prof. Brian Keating, **UCSD Physics/CASS**
- 2017 – High school sophomore *Isaac Broudy* with Prof. Brian Keating, **UCSD Physics/CASS**
- 2016 – Physics undergraduate student *Calvin Leung* with Prof. Jason Galicchio, **Harvey Mudd College Physics (University of Vienna)**, Prof. David I. Kaiser, (**MIT Physics graduate school**)
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- 2015-16 Physics undergraduate *Jonah Saidian* with Prof. Brian Keating, **UCSD Physics/CASS**
- 2012-15 *Isabella Sanders & Anthony Mark* on MIT Undergraduate Research Opportunities Astrophysics Project with Prof. David Kaiser, **MIT STS / Physics**
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