

## Dr. Andrew Samuel Friedman

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### EDUCATION

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- 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

### PROFESSIONAL APPOINTMENTS

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- 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 (NSF) STS Postdoctoral Fellow, **MIT**

### GRANTS, FELLOWSHIPS, HONORS, TELESCOPE TIME, AND AWARDS

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- 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**
- 2015-19 NSF INSPIRE Award #1541160, **MIT** (\$900,360), Co-PI with D. Kaiser, A. Guth (MIT); Co-Is J. Gallicchio (Chicago), B. Keating (UCSD) (+A. Zeilinger Vienna)
- 2015-19 NASA Hubble Space Telescope, Cycle 23, #14216, Co-I; PI R. Kirshner, **Harvard** (\$320,686)
- 2016-17 **NASA /JPL R&TD** Innovative Spontaneous Concept Proposal (\$43,690), Co-I with PI H. Nguyen (JPL/Caltech), J. Gallicchio (Harvey Mudd), D. Kaiser (MIT)
- 2012-14 NSF SES Award #1056580 **MIT** (\$120,000), Co-PI with D. Kaiser (MIT)
- 2012-14 NASA Hubble Space Telescope, Cycle 20, #13046, Co-I; PI R. Kirshner, **Harvard** (\$350,542)
- 2006-09 NASA Graduate Student Research Program Fellowship, **Harvard University / NASA Goddard Spaceflight Center**
- 2007-08 NASA *Swift* Satellite, Cycle 4, Co-I; PI R. Kirshner, **Harvard University**
- 2002-06 NSF Graduate Research Fellowship, **Harvard University Department of Astronomy**
- 2004,05 Certificate of Distinction in Teaching, **Harvard University** (Spring 2004, Fall 2005)
- 2003-07 James Mills Pierce Fellowship, Department of Astronomy, **Harvard University**

### 57 SCIENTIFIC PUBLICATIONS

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

### ALTERNATIVE METRICS

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- 5 articles since 2014 ([1](#), [2](#), [3](#), [4](#), [5](#)) in top 5% of all research outputs scored by [Altmetric.com](#), each in **97-99<sup>th</sup>** 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](#). [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](#)).

### SELECTED PUBLICATIONS

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- 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](#))
- 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 submitted*, ([arXiv:1902.03261](https://arxiv.org/abs/1902.03261))
- 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 Rauch, D., Handsteiner, J., Hochner, A., Gallicchio, J., **Friedman, A.S.**, + 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]
- 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]
- 2015 **Friedman, A.S.** + 2015c, “[CfAIR2: Near-Infrared Light Curves of 94 Type Ia Supernovae](https://arxiv.org/abs/1408.0465)”, *The Astrophysical Journal Supplement Series*, Vol. 220, Iss. 1, id. 9, 35 pp ([arXiv:1408.0465](https://arxiv.org/abs/1408.0465)) (DOI)
- 2014 Gallicchio, J.; **Friedman, A.S.**; Kaiser, D.I., “[Testing Bell’s Inequality with Cosmic Photons: Closing the Setting-Independence Loophole](https://arxiv.org/abs/1310.3288)”, *Physical Review Letters*, Vol. 112, Issue 11, id. 110405 (2014) ([arXiv:1310.3288](https://arxiv.org/abs/1310.3288)) (DOI)
- 2013 **Friedman, A.S.**, Kaiser, D.I., & Gallicchio, J. 2013, “[The Shared Causal Pasts and Futures of Cosmological Events](https://arxiv.org/abs/1305.3943)”, *Phys. Rev. D*, Vol. 88, Issue 4, id. 044038, 18 pp. ([arXiv:1305.3943](https://arxiv.org/abs/1305.3943)) (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](https://arxiv.org/abs/0908.0536)”, *The Astrophysical Journal*, Vol. 704, Issue 1, pp. 629-651 ([arXiv:0908.0536](https://arxiv.org/abs/0908.0536)), (DOI)
- 2008 Wood-Vasey, W.M., **Friedman, A.S.** + 2008, “[Type Ia Supernovae are Good Standard Candles in the Near Infrared: Evidence from PAIRITEL](https://arxiv.org/abs/0711.2068)”, *The Astrophysical Journal*, Vol. 689, Issue 1, pp. 377-390 ([arXiv:0711.2068](https://arxiv.org/abs/0711.2068)), (DOI)
- 2005 **Friedman, A.S.** & Bloom, J.S. 2005a, “[Toward a More Standardized Candle Using GRB Energetics and Spectra](https://arxiv.org/abs/astro-ph/0408413)”, *ApJ*, Vol. 627, Issue 1, pp. 1-25 ([astro-ph/0408413](https://arxiv.org/abs/astro-ph/0408413)), (DOI)

## INVITED TALKS & PRESENTATIONS

- 2005 – **Talks**: Harvard (5), UC San Diego (13), American Astronomical Society (4), MIT (3), Vienna (2), SDSU (1), New Mexico Tech (1), Pittsburgh (1), Western Ontario (1), UCSB (1), LBNL (1)
- 2004 – **Posters**: AAS (3), MIT (1), Caltech (1), Berkeley (2), UCSB (1), NASA GSFC (1), Rome (1)

## TEACHING

- 2018 Lecturer, “Cosmology”, **UC San Diego** (Spring 2018)
- 2012-15 Co-Leader, “Harvard/MIT Philosophy of Science Group”, **Harvard University**
- 2004-15 Teaching Fellow, “The Energetic Universe” (Spring 15), “Cosmic Connections” (Fall 05), “Matter In the Universe” (Spring 04, 05), **Harvard University**
- 2001-02 Teaching Assistant, **Summer Science Program**, (Summer 02), Happy Valley School, Ojai, CA; Teaching Assistant, “Introductory Astronomy” (Fall 01), **UC Berkeley**

## MENTORING

- 2012 – **High School**: Isaac Broudy (Bonita Vista), **Undergrad**: Jeff Iuliano (Harvard), Isabella Sanders, Anthony Mark (MIT), Calvin Leung (Harvey Mudd), Jonah Saidian, Kevin Crowley, Walker Stevens (UCSD); **Grad**: David Leon, Roman Gerasimov (UCSD); **Postdoc**: Arturo Avelino (Harvard)

## OUTREACH AND MEDIA COVERAGE

- 2006 – **Popular Science Writing**: *Nautilus*, *Astronomy Magazine*, *Sky & Telescope*, *NOVA: The Nature of Reality*, *Rune: The MIT Journal of Arts and Letters*, *Berkeley Scientific Journal*
- 2004 – **Selected Media Coverage**