

# Curriculum Vitae

## Gary M. Bernstein

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**Education** Ph.D., Physics, University of California, Berkeley, December 1989.  
Thesis Title: *Measurements of the Spectrum and Anisotropy of the Millimeterwave Background*; Advisor: Paul Richards.

A.B., Physics, *summa cum laude*, Princeton University, 1983.  
Thesis Title: *Investigation of Variations in Atmospheric Microwave Emission Using a Correlation Radiometer*; Advisor: David Wilkinson.

### **Employment**

2008-present Reese W. Flower Professor of Physics and Astronomy, University of Pennsylvania

2007-2008 Professor of Physics and Astronomy, University of Pennsylvania

2002-2007 Associate Professor of Physics and Astronomy, University of Pennsylvania

2001-2002 Associate Professor of Astronomy, University of Michigan

1994-2001 Assistant Professor of Astronomy, University of Michigan

1991-1994 Bok Fellow, Steward Observatory, Tucson, Arizona

1989-1991 Postdoctoral MTS, AT&T Bell Laboratories, Murray Hill, New Jersey

1983-1989 Research Asst., Dept. of Physics, University of California, Berkeley

1982-1983 Laboratory Asst., Naval Research Laboratory, Washington D.C.

1981 Laboratory Asst., National Bureau of Standards, Gaithersburg, Maryland

**PhD Advisor:** Paul L. Richards (Berkeley)  
**Postdoctoral Advisor:** J. A. Tyson (UC Davis)

### **Advisees**

**PhD;** Deano R. Smith (PhD granted 2000, now secondary-school teacher), R. Lynne Jones (2002, U. Washington), R. Michael Jarvis (2002, U. Penn), Peter Allen (2005, F&M), Reiko Nakajima (2007, Bonn), Laura Marian (2008, Sussex), Andres Plazas (2012, Princeton), Christina Krawiec (2018, ScienceWorks), Pedro Bernardinelli (2021, U. Washington), Vernon Wetzell (2021-), Rafael Gomes (2021-)

**Postdoctoral:** Phillipe Fischer (1999-2002), David Trilling (2003-04), David Rusin (2003-06); Jacek Guzik (2004-05); Zhaoming Ma (2006-09); Cai Yan-Chuan (2009-11); R. Armstrong (2011-2014), Marisa March (2013-2015), Eric Suchyta (2015-16), Jesus Vega Ferrero (2016-17), Katherine Eckert (2016-20), Carles Sanchez (2017-2022), Marco Gatti (2020-)

**Honors and Awards**

Fellow of the American Astronomical Society (2022)  
Co-discoverer, Comet C/2014 UN<sub>271</sub> (Bernardinelli-Bernstein)  
National Science Foundation CAREER Award (1996)  
Top 50 scorers, Putnam Mathematics Competition (1982, 1983)

**National Service**

DOE Laboratory Cosmic Frontier Review (2016, 2021)  
Lawrence Berkeley National Lab Physics Division Internal Review (2017)  
Hubble Space Telescope Time Allocation Committee (2008, 2011, 2014, 2022)  
NSF Astrophysics Portfolio Review (2011-2012)  
Astrophysics Subcommittee of NASA Advisory Council (2011-2014)  
Joint Dark Energy Mission Interim Science Working Group [NASA/DoE] (2009-10)  
Particle Astrophysics Scientific Assessment Group [NSF/DoE] (2009)  
Joint Dark Energy Mission Science Working Group [NASA/DoE] (2008)  
Dark Energy Task Force [NASA/NSF/DoE] (2005-2006)  
Joint Dark Energy Mission Science Definition Team [NASA/DoE] (2005-06)  
Grant review panels for NSF, NASA, DOE (approx. 1 per year)  
*The Big Throughput Camera (BTC)* was available as a facility instrument on the Cerro Tololo Blanco 4-meter telescope from 1996-1999, with construction and support supervised by GMB.  
Referee for 5-10 journal papers and grant applications per year from US, Canadian, & European agencies.

**University Service**

SAS Planning Committee (2021-)  
SAS Committee on Undergraduate Academic Standing (2021-)  
SAS Personnel Committee (2013-2016, Chair 2015-2016)  
SAS Teaching Award Selection Committee (2013, 2014, chaired 2015)  
SAS Energy Cluster proposal committee (2012-2013)  
Open Learning Faculty Advisory Committee (2012-2014)

**Courses Taught Recently**

Astro 007, *The Big Bang and Beyond*, Fall 2020, Fall 2021, Fall 2022  
Astro 001, *A Survey of the Universe*, Spring 2019, Spring 2020, Spring 2022  
Physics 016, *Energy, Oil, & Global Warming*, Spring 2021 & 2022, Fall 2023

**Collaborations**

The *Dark Energy Survey* is a collaboration of ~400 scientists in 7 countries

(prepared July 2023)

**Significant publications**

(Citation counts provided by Astrophysics Data System as of 11 July 2023)

Bernstein, Holler, Navarro-Escamilla, Bernardinelli, et al (2023), "Synchronous Rotation in the (136199) Eris-Dysnomia System," PSJ, 4, 115

Abbott et al (2023), "DES Y3 + KIDS-1000: Consistent cosmology combining cosmic shear surveys," arXiv:2305.17173

Gomes, Murray, Gomes, Holman, & Bernstein (2023), "Can the Gravitational Effect of Planet X be Detected in Current-era Tracking of the Known Major and Minor Planets?," PSJ 4, 66.

Bernardinelli, Bernstein, Jindal et al (2023), "Photometry of outer Solar System objects from the Dark Energy Survey I: photometric methods, light curve distributions and trans-Neptunian binaries," arXiv:2304.03017 (26 cites)

Porth, Bernstein, & Smith (2022), "The information content of projected galaxy fields," MNRAS 318, 3344 (4 cites)

Napier, Gerdes, Lin, Hamilton et al. (2021), "No Evidence for Orbital Clustering in the Extreme Trans-Neptunian Objects," PSJ 2 59 (25 cites).

Gatti, Giannini, Bernstein, Alarcon et al. (2022), "Dark Energy Survey Year 3 Results: Clustering Redshifts -- Calibration of the Weak Lensing Source Redshift Distributions with redMaGiC and BOSS/eBOSS," MNRAS, 510, 1223, (44 citations)

Bernardinelli, Bernstein, Sako, Yanny, et al. (2022), "A Search of the Full Six Years of the Dark Energy Survey for Outer Solar System Objects," ApJ Supp 258, 41 (26 cites)

Abbott et al (2022), "Dark Energy Survey Year 3 results: Cosmological constraints from galaxy clustering and weak lensing," PRD 105, 023520 (494 cites)

Bernardinelli, Bernstein, Montet, Weryk, Wainscoat, et al (2021), "C/2014 UN<sub>271</sub> (Bernardinelli-Bernstein): The Nearly Spherical Cow of Comets," ApJ Letters, 921, L37 (17 cites)

Myles, Alarcon, Amon, Sanchez et al. (2021), "Dark Energy Survey Year 3 Results: Redshift Calibration of the Weak Lensing Source Galaxies," MNRAS 505, 4249 (76 cites)

Alarcon, Sanchez, Bernstein, and Gaztanaga (2020), "Redshift inference from the combination of galaxy colours and clustering in a hierarchical Bayesian model - Application to realistic N-body simulations," MNRAS, 498, 2614 (31 cites).

Sanchez and Bernstein (2019), "Redshift inference from the combination of galaxy colours and clustering in a hierarchical Bayesian model," MNRAS, 483, 2801 (41 cites).

Abbott, Abdalla, Annis, Bechtol et al. (2018), "Dark Energy Survey Year 1 Results: A Precise H0 Estimate from DES Y1, BAO, and D/H Data," MNRAS, 480, 3879 (232 cites).

Troxel, MacCrann, Zuntz, Eifler et al. (2018), "Dark Energy Survey Year 1 results: Cosmological constraints from cosmic shear," PhysRevD, 98, 043528 (505 cites).

Abbott, Abdalla, Alarcon, Aleksiya et al. (2018), "Dark Energy Survey year 1 results: Cosmological constraints from galaxy clustering and weak lensing," PhysRevD, 98, 043526 (956 cites).

Hoyle, Gruen, Bernstein, Rau et al. (2018), "Dark Energy Survey Year 1 Results: redshift distributions of the weak-lensing source galaxies," MNRAS, 478, 592 (158 cites).

Bernstein, Abbott, Desai, Gruen et al. (2017), "Instrumental response model and detrending for the Dark Energy Camera," PASP, 129, 114502 (34 cites).

Bernstein, Armstrong, Plazas, Walker et al. (2017), "Astrometric Calibration and Performance of the Dark Energy Camera," PASP, 129, 074503 (40 cites).

Abbott, Abdalla, Allam, Amara et al. (2016), "Cosmology from cosmic shear with Dark Energy Survey Science Verification data," PhysRevD, 94, 022001 (184 cites).

Rowe, Jarvis, Mandelbaum, Bernstein et al. (2015), "GALSIM: The modular galaxy image simulation toolkit," Astronomy and Computing, 10, 121 (275 cites).

Bernstein and Cai (2011), "Cosmology without cosmic variance," MNRAS, 416, 3009 (54 cites).

Bernstein and Huterer (2010), "Catastrophic photometric redshift errors: weak-lensing survey requirements," MNRAS, 401, 1399 (110 cites).

Albrecht, Amendola, Bernstein, Clowe et al. (2009), "Findings of the Joint Dark Energy Mission Figure of Merit Science Working Group," arXiv e-prints, arXiv:0901.0721 (190 cites).

Albrecht, Bernstein, Cahn, Freedman et al. (2006), "Report of the Dark Energy Task Force," arXiv e-prints, astro-ph/0609591 (1117 cites).

Jarvis, Jain, Bernstein, and Dolney (2006), "Dark Energy Constraints from the CTIO Lensing Survey," ApJ, 644, 71 (132 cites).

Heymans, Van Waerbeke, Bacon, Berge et al. (2006), "The Shear Testing Programme - I. Weak lensing analysis of simulated ground-based observations," MNRAS, 368, 1323 (423 cites).

Huterer, Takada, Bernstein, and Jain (2006), "Systematic errors in future weak-lensing surveys: requirements and prospects for self-calibration," MNRAS, 366, 101 (341 cites).

Bernstein (2006), "Metric Tests for Curvature from Weak Lensing and Baryon Acoustic Oscillations," *ApJ*, 637, 598 (83 cites).

Bernstein, Trilling, Allen, Brown et al. (2004), "The Size Distribution of Trans-Neptunian Bodies," *AJ*, 128, 1364 (365 cites).

Jarvis, Bernstein, and Jain (2004), "The skewness of the aperture mass statistic," *MNRAS*, 352, 338 (236 cites).

Bernstein and Jain (2004), "Dark Energy Constraints from Weak-Lensing Cross-Correlation Cosmography," *ApJ*, 600, 17 (130 cites).

Jarvis, Bernstein, Fischer, Smith et al. (2003), "Weak-Lensing Results from the 75 Square Degree Cerro Tololo Inter-American Observatory Survey," *AJ*, 125, 1014 (168 cites).

Bernstein and Jarvis (2002), "Shapes and Shears, Stars and Smears: Optimal Measurements for Weak Lensing," *AJ*, 123, 583 (445 cites).

Smith, Bernstein, Fischer, and Jarvis (2001), "Weak-Lensing Determination of the Mass in Galaxy Halos," *ApJ*, 551, 643 (75 cites).

Allen, Bernstein, and Malhotra (2001), "The Edge of the Solar System," *ApJ*, 549, L241 (108 cites).

Bernstein and Khushalani (2000), "Orbit Fitting and Uncertainties for Kuiper Belt Objects," *AJ*, 120, 3323 (128 cites).

Fischer, McKay, Sheldon, Connolly et al. (2000), "Weak Lensing with Sloan Digital Sky Survey Commissioning Data: The Galaxy-Mass Correlation Function to  $1 h^{-1}$  Mpc," *AJ*, 120, 1198 (209 cites).

Wittman, Tyson, Kirkman, Dell'Antonio, and Bernstein (2000), "Detection of weak gravitational lensing distortions of distant galaxies by cosmic dark matter at large scales," *nat*, 405, 143 (514 cites).

Bernstein and Fischer (1999), "Values of  $H_0$  from Models of the Gravitational Lens 0957+561," *AJ*, 118, 14 (61 cites).

Bernstein, Nichol, Tyson, Ulmer, and Wittman (1995), "The Luminosity Function of the Coma Cluster Core for  $-25 < M/R < -9.4$ ," *AJ*, 110, 1507 (236 cites).