

## Biographical Sketch of Bhuvnesh Jain: 2016

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### Education:

1989      A.B. (High Honors)    Physics      Princeton University  
1994      Ph.D.                    Physics      M.I.T.  
            Thesis title: The Evolution of Cosmological Density Fluctuations  
            Co-supervisors: E. Bertschinger, A. Guth

### Professional Appointments:

2016-      Walter H. and Leonore C. Annenberg Professor in the Natural Sciences  
2011-2015    Edmund J. and Louise W. Kahn Term Professor in the Natural Sciences  
2009-      Co-Director, Center for Particle-Cosmology, University of Pennsylvania  
2009-      Professor, Department of Physics & Astronomy, University of Pennsylvania  
2004-2009    Associate Professor, University of Pennsylvania  
2001-2004    Assistant Professor, University of Pennsylvania  
1999-2000    Associate Research Scientist, Johns Hopkins University  
1997-1999    Postdoctoral Fellow, Johns Hopkins University  
1994-1997    Postdoctoral Fellow, Max-Planck-Institute for Astrophysics

### Positions and Honors:

2015-      Fellow, American Physical Society  
2015-      Science Policy Committee, SLAC Board of Overseers, Stanford University  
2012-2015    Spokesperson, Large Synoptic Survey Telescope (LSST) Dark Energy Science  
            Collaboration  
2007-      Co-coordinator, Dark Energy Survey (DES) Weak Lensing Working Group  
2014-      Science Advisory Council, LSST  
2006-2012    Co-chair, Large Synoptic Survey Telescope (LSST) Weak Lensing Science  
            Collaboration  
2004-2009    Cottrell Scholars Award  
2007      Editor, Focus Issue on Gravitational Lensing, New Journal of Physics  
1989-91     Karl Taylor Compton Fellow, MIT

### Recent University and Department Service:

2006-      Penn representative on the Management Committee of the DES project  
2001-      Served on several faculty search/promotion committees (five as chair)  
2007-2009    Faculty Senate  
2006-2009    Penn representative on the Board of the LSST project

### Publications in Refereed Journals:

1. "Density Fluctuations in Extended Inflation," A. H. Guth and B. Jain, 1992, Phys. Rev. **D 45**, 426-432.
2. "Gravitational Instability of Cold Matter," E. Bertschinger and B. Jain, 1994, ApJ, **431**, 486-494.
3. "Second Order Power Spectrum and Nonlinear Evolution at High Redshift," B. Jain and E. Bertschinger, 1994, ApJ, **431**, 495-505.
4. "Nonlinear Evolution of Correlation Functions and Power Spectra," B. Jain, H. J. Mo and S. D. M. White, 1995, MNRAS, **276**, L25-L29.
5. "Self-Similar Evolution of Gravitational Clustering: Is  $n = -1$  Special?," B. Jain and E. Bertschinger, 1996, ApJ, **456**, 43-54.
6. "The Nonlinear Correlation Function and Density Profiles of Virialized Halos," R. Sheth and B. Jain, 1997, MNRAS, **285**, 231-238.
7. "Does Gravitational Clustering Stabilize on Small Scales?," B. Jain, 1997, MNRAS, **287**, 687-698.
8. "Cosmological Model Predictions for Weak Lensing: Linear and Nonlinear Regimes," B. Jain and U. Seljak, 1997, ApJ, **484**, 560-573.
9. "Detection of Shear due to Weak Lensing by Large-Scale Structure," P. Schneider, L. van Waerbeke, Y. Mellier, B. Jain, S. Seitz, B. Fort, 1998, A & A, **333**, 767-778.
10. "The Effect of Weak Lensing on the Angular Correlation Function of Faint Galaxies," R. Moessner, B. Jain and J. V. Villumsen, 1998, MNRAS, **294**, 291-298.
11. "A New Measure for Cosmic Shear," P. Schneider, L. van Waerbeke, B. Jain, G. Kruse, 1998, MNRAS, **296**, 873-892.
12. "Angular Cross-Correlation of Galaxies: A Probe of Gravitational Lensing by Large-Scale Structure," R. Moessner and B. Jain, 1998, MNRAS, **294**, L18-24.
13. "Self-Similar Evolution of Gravitational Clustering II: N-Body Simulations of the  $n = -2$  Spectrum," B. Jain and E. Bertschinger, 1998, ApJ, **509**, 517-530.
14. "The Formation and Evolution of Clusters of Galaxies in Different Cosmogonies," A. Huss, B. Jain and M. Steinmetz, 1999, MNRAS, **308**, 1011-1031.
15. "How universal are the density profiles of dark halos?," A. Huss, B. Jain and M. Steinmetz, 1999, ApJ, **517**, 64-69.
16. "Cosmic Shear and Halo Abundances: Analytical Versus Numerical Results," K. Reblinsky, G. Kruse, B. Jain and P. Schneider, 1999, A & A, **351**, 815-826.
17. "Ray Tracing Simulations of Weak Lensing by Large-Scale Structure," B. Jain, U. Seljak and S. White, 2000, ApJ, **530**, 547-577.
18. "The Statistics of Weak Lensing at Small Angular Scales: Probability Distribution Function," D. Munshi and B. Jain, 2000, MNRAS, **318**, 109-123.
19. "Weak Lensing with SDSS Commissioning Data: The Galaxy-Mass Correlation Function To 1/h Mpc," P. Fischer et al (SDSS Collaboration), 2000, AJ, **120**, 1198-1208.
20. "Detection of Correlated Galaxy Ellipticities from CFHT Data: First Evidence for

- Gravitational Lensing by Large-Scale Structures,” L. van Waerbeke et al, 2000, *A & A*, **358**, 30-44.
21. “Statistics of Dark Matter Halos from Gravitational Lensing,” B. Jain and L. van Waerbeke, 2000, *ApJL*, **530**, L1-L4.
  22. “Statistics of Weak Lensing at Small Angular Scales: Analytical Predictions for Lower Order Moments,” D. Munshi and B. Jain, 2001, *MNRAS*, **322**, 107-120.
  23. “How Many Galaxies Fit in a Halo? Constraints on Galaxy Formation Efficiency from Spatial Clustering,” R. Scoccimarro, R. Sheth, L. Hui and B. Jain, 2001, *ApJ*, **546**, 20-34.
  24. “The Topology of Weak Lensing Fields,” T. Matsubara and B. Jain, 2001, *ApJL*, **552**, L89-L92.
  25. “Cosmic Shear Analysis in 50 Uncorrelated VLT Fields. Implications for  $\Omega_0$ ,  $\sigma_8$ ,” R. Maoli et al, 2001, *A & A*, **368**, 766-775.
  26. “Cosmic Shear Statistics and Cosmology,” L. van Waerbeke et al, 2001, *A & A*, **374**, 757-769.
  27. “Cosmic Shear from STIS Pure Parallels. I. Data,” N. Pirzkal et al, 2001, *A & A*, **375**, 351-358.
  28. “Cosmic Shear from STIS Pure Parallels. II. Analysis,” H. Hammerle et al, 2002, *A & A*, **385**, 743-760.
  29. “The Kurtosis of the Cosmic Shear Field,” M. Takada and B. Jain, 2002, *MNRAS*, **337**, 875-894.
  30. “Magnification Effects as Measures of Large-Scale Structure,” B. Jain, 2002, *ApJ*, **580**, L3-L6.
  31. “The Angular Correlation Function of Galaxies from Early Sloan Digital Sky Survey Data,” A. Connolly, SDSS Collaboration, 2002, *ApJ*, **579**, 42-47.
  32. “Analysis of Systematic Effects and Statistical Uncertainties in Angular Clustering of Galaxies from Early Sloan Digital Sky Survey Data,” R. Scranton, SDSS Collaboration, 2002, *ApJ*, **579**, 48-75.
  33. “The Three-dimensional Power Spectrum from Angular Clustering of Galaxies in Early Sloan Digital Sky Survey Data,” S. Dodelson, SDSS Collaboration, 2002, *ApJ*, **572**, 140-156.
  34. “The Angular Power Spectrum of Galaxies from Early Sloan Digital Sky Survey Data,” M. Tegmark, SDSS Collaboration, 2002, *ApJ*, **571**, 191-205.
  35. “Likelihood Analysis of Cosmic Shear on Simulated and VIRMOS-DESCART Data,” L. van Waerbeke et al, 2002, *A & A*, **393**, 369-379.
  36. “A Conspicuous Tangential Alignment of Galaxies in a STIS Parallel Shear Survey Field: A New Dark-lens Candidate?,” J. -M. Miralles et al, 2002, *A & A*, **388**, 68-73.
  37. “The Three-Point Correlation Function in Cosmology,” M. Takada and B. Jain, 2003, *MNRAS*, **340**, 580-608.
  38. “The Three-Point Correlation Function for Spin-2 Fields,” M. Takada and B. Jain, 2003, *ApJL*, **583**, L49-L52.
  39. “Karhunen-Love Estimation of the Power Spectrum Parameters from the Angular Distribution of Galaxies in Early Sloan Digital Sky Survey Data,” A. Szalay, B. Jain, T. Matsubara, R. Scranton, M. Vogeley, SDSS collaboration, 2003, *ApJ*, **591**, 1-11.
  40. “Weak-Lensing Results from the 75 Square Degree Cerro Tololo Inter-American Observatory Survey,” M. Jarvis et al, 2003, *AJ*, **125**, 1014-1032.

41. "Three-Point Correlations in Weak Lensing Surveys: Model Predictions and Applications," M. Takada and B. Jain, 2003, MNRAS, **344**, 857-886.
42. "Quasar-Galaxy and Galaxy-Galaxy Cross-Correlations: Model Predictions with Realistic Galaxies," B. Jain, R. Scranton and R. Sheth, 2003, MNRAS, **345**, 62-70.
43. "Cross-correlation Tomography: Measuring Dark Energy Evolution with Weak Lensing," B. Jain and A. Taylor, 2003, Phys. Rev. Lett. **91**, 141302, (4pp).
44. "Last Stand Before WMAP: Cosmological Parameters from Lensing, CMB, and Galaxy Clustering," X. Wang, M. Tegmark, B. Jain, M. Zaldarriaga, 2003, Phys. Rev. D, **681**, 3001 (12pp).
45. "Dark Energy Constraints from Weak Lensing Cross-Correlation Cosmography," G. Bernstein and B. Jain, 2004, ApJ, **600**, 12-25.
46. "Substructure and the Halo Model of Large-Scale Structure," R. Sheth and B. Jain, 2003, MNRAS, **345**, 529-538.
47. "Cosmological Parameters from Lensing Power Spectrum and Bispectrum Tomography," M. Takada and B. Jain, 2004, MNRAS, **348**, 897-915.
48. "Effects of Halo Substructure on the Power Spectrum and Bispectrum," D. Dolney, B. Jain and M. Takada, 2004, MNRAS, 352, 1019
49. "Joint Galaxy-Lensing Observables and the Dark Energy," W. Hu and B. Jain, 2004, Phys. Rev. D, 70, 43009 (16pp).
50. "The Three-Dimensional Power Spectrum of Galaxies from the Sloan Digital Sky Survey," M. Tegmark et al, 2004, ApJ, 606, 702-740
51. "Cosmological parameters from SDSS and WMAP," M. Tegmark et al, 2004, Phys. Rev. D, **69**, 103501 (26pp).
52. "Detection of Cosmic Magnification with the Sloan Digital Sky Survey," R. Scranton et al., 2005, ApJ, 633, 589-602
53. "Constraints on dark energy models from galaxy clusters with multiple arcs," 2005, M. Meneghetti, B. Jain, M. Bartelmann, K. Dolag, MNRAS, 362, 1301-1310
54. "PSF anisotropy and systematic errors in weak lensing surveys," B. Jain, M. Jarvis and G. Bernstein, 2006, JCAP, 02, 001 (18pp).
55. "Systematic errors in future weak-lensing surveys: requirements and prospects for self-calibration," D. Huterer, M. Takada, G. Bernstein and B. Jain, 2006, MNRAS, 366, 101-114
56. "Baryon oscillations and dark-energy constraints from imaging surveys," 2006, D. Dolney, B. Jain, M. Takada, MNRAS, 366, 884-898
57. "Dark Energy Constraints from the CTIO Lensing Survey," 2006, M. Jarvis, B. Jain, G. Bernstein and D. Dolney, ApJ, 644, 71-79
58. "Short GRB and binary black hole standard sirens as a probe of dark energy," N. Dalal, D. Holz, S. Hughes and B. Jain, 2006, Phys. Rev. D, 2006, 74, 3006 (9pp).
59. "Cosmological constraints from the SDSS luminous red galaxies," M. Tegmark et al., 2006, Phys. Rev. D, 74, 123507 (34pp).
60. "N-Body Simulations of Alternate Gravity Models," H. Stabenau and B. Jain, 2006, Phys. Rev.

D, 74, 084007 (13pp).

61. "Color Tomography," B. Jain, A. Connolly and M. Takada, 2007, JCAP, 03, 13 (23pp).

62. "On combining lensing shear information from multiple filters," M. Jarvis and B. Jain, 2008, JCAP, 01, 003 (8pp).

63. "Photometric Redshifts with Surface Brightness Priors," H. Stabenau, A. Connolly, B. Jain, 2007, MNRAS, 387, 1215-1226

64. "Observational Tests of Modified Gravity," B. Jain and P. Zhang, 2007, Phys. Rev. D, 78, 063503, arXiv:0709.2375

65. "Weak Gravitational Lensing and its Cosmological Applications," H. Hoekstra and B. Jain, 2008, Ann. Rev. of Nuc. and Part. Science, 58, 99

66. "Galaxy-CMB and galaxy-galaxy lensing on large scales: Sensitivity to primordial non-Gaussianity," 2009, Jeong, D., Komatsu, E., **Jain, B.**, PRD, 80, 123527

67. "Tests of gravity from imaging and spectroscopic surveys," 2009, Guzik, J., **Jain, B.**, Takada, M., PRD, 81, 023503

68. "Topological defects in gravitational lensing shear fields," 2009, Vitelli, V., **Jain, B.**, Kamien, R., 2009, JCAP, 09, 034

69. "Three-point correlations in f(R) models of gravity," 2009, A. Borisov, B. Jain, PRD, 79, 3506

70. "MgII absorption systems and their neighbouring galaxies from a background-subtraction technique," 2010, M. Caler, R. Sheth and B. Jain, MNRAS, 406, 1269

71. "Lensing magnification: implications for counts of submillimetre galaxies and SZ clusters," 2010, M. Lima, B. Jain, M. Devlin, MNRAS, 406, 2352

72. "Submillimeter Galaxy Number Counts and Magnification by Galaxy Clusters," 2010, M. Lima, B. Jain, Devlin, M., Aguirre, J., *ApJ*, 717, L31

73. "*Cosmological Tests of Gravity*," 2010, B. Jain, J. Khoury, *Annals of Physics*, 325, 1479

74. "Re-capturing Cosmic Information," 2011, H-J. Seo, M. Sato, S. Dodelson, B. Jain, M. Takada, *ApJ*, 729, L11

75. "Magnification effects on source counts and fluxes," 2011, B. Jain and M. Lima, MNRAS, 411, 2113

76. "Three-dimensional Reconstruction of the Density Field: An SVD Approach to Weak-lensing Tomography," 2011, J. VanderPlas, A. Connolly, B. Jain, M. Jarvis, *ApJ*, 727, 118

77. "Tests of modified gravity with dwarf galaxies," 2011, B. Jain, J. VanderPlas, JCAP, 10, 032

78. "Microlensing of Kepler Stars as a Method of Detecting Primordial Black Hole Dark Matter," 2011, K. Griest, M. Lehner, A. Cieplak, B. Jain, PRL, 107, 1101

79. "Interpolating Masked Weak Lensing Signal with Karhunen-Loeve Analysis," 2012, J. VanderPlas, A. Connolly, B. Jain, & M. Jarvis, *ApJ*, 744, 180

80. "Spherical Collapse in f(R) Gravity," 2012, A. Borisov, B. Jain, P. Zhang, PRD, 85, 3581

81. "Halo Scale Predictions of Symmetron Modified Gravity," J. Clampitt, B. Jain, J. Khoury, 2012, JCAP, 01, 030

82. "Astrophysical tests of gravity: a screening map of the nearby universe," 2012, Cabre, A., Vikram, V., Zhao, G., B. Jain, Koyama, K., JCAP, 07, 034
83. "Astrophysical Tests of Modified Gravity: Constraints from Distance Indicators in the Nearby Universe," 2012, B. Jain, V. Vikram, J. Sakstein, ApJ, 779, 39, arXiv:1204.6044
84. "The impact of camera optical alignments on weak lensing measures for the Dark Energy Survey," 2012, M. Antonik, et al, MNRAS, 431, 3291, arXiv:1206.5320
85. "Astrophysical Tests of Modified Gravity: the Morphology and Kinematics of Dwarf Galaxies," 2012, V. Vikram, A. Cabre, B. Jain, J. VanderPlas, JCAP, 08, 020, arXiv:1303.0295
86. "Information content of weak lensing power spectrum and bispectrum: including the non-Gaussian error covariance matrix," 2013, Kayo, I., Takada, M., B. Jain, MNRAS, 429, 344
87. "The effective number density of galaxies for weak lensing measurements in the LSST project," 2013, C. Chang, M. Jarvis, B. Jain, et al, MNRAS, 434, 2121
88. "Detecting modified gravity in the stars," 2014, J. Sakstein, B. Jain, V. Vikram, IJMPD, 23, 12
89. "Delensing galaxy surveys," 2014, C. Chang, B. Jain, MNRAS, 443, 102, arXiv:1405.1432
90. "Growth of cosmic structure: Probing dark energy beyond expansion," 2015, D. Huterer et al, Astroparticle Physics, 63, 23
91. "Beyond the Cosmological Standard Model," 2015, A. Joyce, B. Jain, J. Khoury, M. Trodden, Physics Reports, 568, 1, arXiv:1407.0059
92. "Cosmic discordance: are Planck CMB and CFHTLenS weak lensing measurements out of tune?," N. MacCrann, J. Zuntz, S. Bridle, B. Jain, M. Becker, 2015, MNRAS, 451, 2877
93. "Wide-Field Lensing Mass Maps from Dark Energy Survey Science Verification Data," C. Chang, V. Vikram, B. Jain, et al., Phys. Rev. Letters, 2015, 115, 051301
94. "Wide-field lensing mass maps from Dark Energy Survey science verification data: Methodology and detailed analysis," V. Vikram, C. Chang, B. Jain, et al, PRD, 2015, 92, 022006
95. "Lensing Measurements of the Mass Distribution in SDSS Voids," J. Clampitt, B. Jain, 2015, MNRAS, 454, 3357, arXiv:1404.1834
96. "Weak lensing by galaxy troughs in DES Science Verification data," 2016, D. Gruen et al., MNRAS, 455, 3367,
97. "CMB lensing tomography with the DES Science Verification galaxies," 2016, T. Giannantonio et al., MNRAS, 456, 3213
98. "Clustering and Bias Measurements of SDSS Voids," J. Clampitt, B. Jain, C. Sanchez, 2016, MNRAS, 456, 4425, arXiv:1507.08031
99. "Detection of Stacked Filament Lensing Between SDSS Luminous Red Galaxies," J. Clampitt, H. Miyatake, B. Jain, M. Takada, 2016, MNRAS, 457, 2391, arXiv:1402.3302
100. "Lensing Measurements of the Ellipticity of Luminous Red Galaxies Dark Matter Halos," J. Clampitt, B. Jain, 2016, MNRAS, 457, 4135, arXiv:1506.03536
101. "The DES Science Verification Weak Lensing Shear Catalogs," M. Jarvis et al, 2016, MNRAS, 460, 2245, arXiv:1507.05603
102. "Cosmology from Cosmic Shear with DES Science Verification Data," The Dark Energy

Survey Collaboration, 2016, *PRD* 94, 022001, arXiv:1507.05552

103. “Joint measurement of lensing?galaxy correlations using SPT and DES SV data,” E. Baxter, J. Clampitt, T. Giannantonio, S. Dodelson, B. Jain, et al, 2016, *MNRAS*, 461, 4099, arXiv:1602.07384

104. “Constraining the Mass-Richness Relationship of redMaPPer Clusters with Angular Clustering,” E. Baxter, E. Rozo, B. Jain, E. Rykoff, R. Wechsler, 2016, *MNRAS*, accepted, arXiv:1604.00048

105. “Tidal stripping as a test of satellite quenching in redMaPPer clusters,” Y. Fang, J. Clampitt, N. Dalal, B. Jain et al, 2016, *MNRAS*, accepted, arXiv:1604.08611

### **Preprints and Other Publications:**

1. “Principal Component Analysis of PSF Variation in Weak Lensing Surveys,” M. Jarvis, B. Jain, 2004; arXiv:astro-ph/0412234

2. “Lensing Systematics from Space: Modeling PSF effects in the SNAP survey,” H. Stabenau, B. Jain, G. Bernstein, M. Lampton, 2007; arXiv:0710.3355

3. “Editorial: Focus on Gravitational Lensing,” B. Jain, 2008, *NJP*, Vol. 9, Issue 12

4. “Telescope Optics and Weak Lensing: PSF Patterns due to Low Order Aberrations,” M. Jarvis, P. Schechter, B. Jain, 2008; arXiv:0810.0027

5. “Weak Gravitational Lensing with LSST,” 2009, D. Wittman, B. Jain, Chapter for LSST Science Book; arXiv:0912.0201

6. “Designing Surveys for Tests of Gravity,” 2011, B. Jain, *Phil. Trans. R. Soc. A*, 369, 5081; arXiv:1104.0415

7. “Novel Probes of Gravity and Dark Energy, Snowmass Report,” B. Jain et al, arXiv:1309.5389

8. “The Whole is Greater than the Sum of the Parts: Optimizing the Joint Science Return from LSST, Euclid and WFIRST,” B. Jain et al, 2015, White Paper, arXiv:1501.07897

### **Selected Recent Presentations:**

2016 Perimeter Institute, Cosmology seminar, Waterloo Canada, May 2016

2016 Carnegie Mellon University, Astronomy seminar, Pittsburgh PA, April 2016

2016 Penn State University, Astronomy colloquium, State College PA, March 2016

2016 Dark Energy Science Collaboration meeting, SLAC, February 2016

2016 McGill University, Physical Society colloquium, Montreal Canada, February 2016

2016 Stony Brook University, Cosmology seminar, Stony Brook NY, February 2016

2016 Essential Cosmology for the Next Generation, plenary talk, Playa del Carmen Mexico, January 2016

2015 Dark Energy Science Collaboration meeting, Argonne National Lab, November 2015

2015 Dark Energy Survey Collaboration meeting, Madrid Spain, October 2015

2015 Princeton University, Gravity Group Seminar, Princeton NJ, September 2015

2015 Unbiased constraints on cosmology, IAS workshop, Invited talk, NJ September 2015

2015 ICTP Advanced School on Cosmology, Lecturer, Trieste Italy, May 2015

2015 University of Arizona, Astronomy Colloquium, Tucson AZ, April 2015

2015 Dark Energy Survey Cosmology Workshop, Organizer, U Penn, March 2015

2015 Cosmology on the slopes, Invited talk, Aspen Workshop, March 2015  
 2015 Dark Energy Science Collaboration meeting, SLAC, February 2015  
 2014 Wide Field Infrared Surveys, Invited talk, Jet Propulsion Lab, November 2014  
 2014 DES collaboration meeting, University of Sussex, October 2014  
 2014 Warren Center Symposium, Invited talk, U Penn, September 2014  
 2014 Cosmic Voids Workshop, Invited talk, Ohio State University, August 2014  
 2014 Combined Probes of Cosmology, Aspen Workshop, August 2014  
 2014 Higgs Symposium, Plenary talk, Edinburgh July 2014  
 2014 Pheno2014 Conference, Plenary talk, Pittsburgh May 2014  
 2014 Penn State, IGC Colloquium, April 2014  
 2014 IAS Princeton, Astrophysics seminar, March 2014  
 2014 OSU Weak Lensing workshop, Columbus, OH, February 2014  
 2014 OSU Astronomy seminar, Columbus, OH, February 2014  
 2013 Presentation to P5 (HEPAP) panel, SLAC, December 2013  
 2013 Snowmass Cosmic Frontiers Plenary talk, July 2013, Minneapolis, MN  
 2013 Columbia, Astronomy colloquium, October 2013  
 2013 Johns Hopkins University, Physics and Astronomy colloquium, November 2013  
 2013 Snowmass workshop, Coordinator of novel probes subgroup, SLAC, CA March 2013  
 2013 University of Pittsburgh, Colloquium, Pittsburgh, PA February 2013  
 2013 CITA seminar, Toronto, Canada, February 2013  
 2012 SAMSI workshop on astrostatistics, Invited talk, Chapel Hill, NC September 2012  
 2012 Santa Fe summer workshop on cosmology, Invited talk, Santa Fe, NM July 2012  
 2012 American Physical Society, Atlanta GA, May 2012  
 2012 Gravity Workshop, Invited talk, Center for Astrophysics, Harvard University, MA May 2012

**Recent courses taught:**

Undergraduate: Astronomy 212, Introduction to Astrophysics II: Stars, Galaxies and the Universe

Graduate: Physics 503, General Relativity

Graduate: Physics 533, Topics in Cosmology

**Undergraduate Students:**

2016- Amanda Farah

2013-2015 Advised summer research by Charles Davis and Andrew Neil

2007-8 Advised undergraduate thesis by Juliette Alimena

2004-6 Advised undergraduate research by Harrison Prentice-Mott

2001 Advised summer research project by Spencer Szczesny

**Ph.D. Students:**

2020 Lucas Secco, Tae-Hyeon Shin

2018 Yuedong Fang

2014 Joseph Clampitt; currently postdoc at Penn

2010 Alex Borisov; currently faculty at Cleveland State University

2010 Michelle Caler (co-supervisor with R. Sheth); currently faculty at West Chester University



2008 Hans Stabenau; currently postdoc at Memorial-Sloan Kettering  
2006 Greg Dobler (research supervisor: Charles Keeton); currently Research Scientist,  
CUSP and Research Assistant Professor of Physics at New York University  
2005 Derek Dolney, currently Instructor in Radiation Oncology at Penn

**Postdocs:**

2015- Vinicius Miranda  
2014- Eric Baxter  
2014-2016 Juliana Kwan  
2007- Mike Jarvis (research staff)  
2012-2014 Elisabeth Krause; currently postdoc at Stanford  
2010-2014 Vinu Vikram; currently postdoc at Argonne/U Chicago  
2012-2014 Tim Eifler; currently research staff at JPL-Caltech  
2009-2012 Anna Cabre; currently postdoc in Earth and Environmental Science at U Penn  
2008-2010 Marcos Lima; currently faculty, U. Sao Paulo, Brazil  
2006-2009 Jacek Guzik; currently faculty, Krakow, Poland  
2002-2007 Mike Jarvis; currently research staff at U Penn  
2001-2004 Masahiro Takada; currently faculty, IMPU, University of Tokyo