

Keith Bechtol

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- Appointments** ◇ **Assistant Professor** 2018–
Physics Department, University of Wisconsin–Madison
- ◇ Associate Scientist, Commissioning Science Verification and Validation 2016–2018
Vera C. Rubin Observatory
- ◇ John Bahcall Postdoctoral Fellow 2015–2016
Wisconsin IceCube Particle Astrophysics Center, University of Wisconsin–Madison
- ◇ KICP Postdoctoral Fellow 2012–2015
Kavli Institute for Cosmological Physics, University of Chicago
- ◇ Student Researcher Summer 2007
SLAC National Accelerator Laboratory, based at CERN working on ATLAS experiment
Advisors: Charlie Young and Su Dong
- ◇ Student Researcher, Research Experience for Undergraduates Summer 2005
Laboratory for Elementary Particle Physics, Cornell University
Advisor: David Kreinick
- ◇ Student Researcher Summer 2004
College of William & Mary Physics Department
Advisor: Jeffrey Nelson

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- Education** ◇ STANFORD UNIVERSITY 2007–2012
Ph.D. in Physics, September 2012
Dissertation Advisor: Stefan Funk
Unbeamed Extragalactic Emitters and the Origin of the Isotropic Diffuse Gamma-ray Background
- ◇ COLLEGE OF WILLIAM & MARY 2003–2007
B.S. *summa cum laude* in Physics, May 2007
Senior Thesis Advisor: Joshua Erlich
Constraining Photon-Axion Oscillation Models with Supernovae Data

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- Current Research Interests**
- ◇ Detection of stellar substructures in the Galactic halo using wide-field optical surveys, including ultra-faint galaxies and stellar streams; spectroscopic follow-up to determine dark matter content
 - ◇ Indirect dark matter searches and astrophysical dark matter probes
 - ◇ Commissioning, science verification, and observing strategy for optical surveys

- ◇ Photometric calibration of optical survey data, including interstellar dust extinction
 - ◇ Census of non-thermal phenomena at the highest energies and greatest distances explored via the extragalactic gamma-ray background and high-energy cosmic neutrinos
 - ◇ Cosmic rays in the interstellar and intergalactic medium, particularly star-forming galaxies and galaxy clusters
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Awards

- ◇ Division of Astrophysics ‘Young Stars’ Award, early career recognition, American Physical Society, 2014
 - ◇ Stanford Graduate Fellowship, highest honor awarded to a continuing graduate student by Stanford University, 2010–2012
 - ◇ Paul Kirkpatrick Award, demonstrated capacity for and commitment to the teaching of undergraduate physics, Stanford University Physics Department, 2008
 - ◇ Donald E. Harrison Jr. Award, given to senior with highest demonstrated achievement in physics, College of William & Mary Physics Department, 2007
 - ◇ President’s Award, College of William & Mary, 2007
 - ◇ Member Phi Beta Kappa, elected 2006
 - ◇ E.G. Clark Memorial Award, given to a rising senior in physics, College of William & Mary Physics Department, 2006
 - ◇ Barry M. Goldwater Scholarship, 2005–2007
 - ◇ DeWilde Fellowship, research grant, College of William & Mary Physics Department, 2004
 - ◇ James Monroe Scholarship, research grant, College of William & Mary, 2006
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Invited Seminars and Colloquia

- ◇ *Constraints on Dark Matter Properties from Observations of Milky Way Satellite Galaxies*. Physics Colloquium, University of Rochester, March 2021
- ◇ Invited panelist for APS DELTA-PHY webinar, *TEAM-UP Report, The Time is Now – Charting a Course to 2030*, November 2020
- ◇ *Constraints on Dark Matter Properties from Observations of Milky Way Satellite Galaxies*. HEP/Astro Results Forum, September 2020
- ◇ *View of the Milky Way Stellar Halo from the Dark Energy Survey*. Laboratório Interinstitucional de e-Astronomia, September 2020
- ◇ *View of the Milky Way Stellar Halo from the Dark Energy Survey*. Astronomy Colloquium, University of Wisconsin–Madison, October 2019
- ◇ *Probing the Fundamental Nature of Dark Matter with the LSST*. Cosmology Lunch Talk, University of Minnesota, April 2019
- ◇ *LSST Commissioning Science Verification and Validation*. Laboratório Interinstitucional de e-Astronomia, October 2018
- ◇ *Searching for the Darkest Galaxies*. Seminar for the “The Small-Scale Structure of Cold(?) Dark Matter” program, Kavli Institute for Theoretical Physics, May 2018
- ◇ *Exploring the Dark Universe with Cosmic Surveys*. Physics Department Colloquium, University of Wisconsin–Madison, February 2018
- ◇ *Dark Energy Survey Year 1 Cosmology Results*. LHC Results Forum, September 2017
- ◇ *Physics with a 10-year Color Movie of 40 Billion Stars and Galaxies*. NPAC Seminar, University of Wisconsin–Madison, February 2017
- ◇ *New Satellite Galaxies of Our Milky Way*. Physics Department Colloquium, University of Wisconsin–Madison, April 2016
- ◇ *New Satellite Galaxies of Our Milky Way*. Physics Department Seminar, University of Cincinnati, February 2016

- ◇ *New Satellite Galaxies of Our Milky Way*. Physics Department Seminar, University of Connecticut, February 2016
- ◇ *The Search for Milky Way Satellite Galaxies from Optical to Gamma Rays*. Astronomy Department Seminar, University of Wisconsin–Madison, October 2015
- ◇ *Exploring the Nature of Dark Matter with Ultra-faint Galaxies*. Physics Division Seminar, Argonne National Laboratory, September 2015
- ◇ *News on the Search for Milky Way Satellite Galaxies*. KICP Colloquium, University of Chicago, May 2015
- ◇ *Spectrum and Origin of the Extragalactic Gamma-ray Background AND Searching for Ultra-faint Satellite Galaxies of the Milky Way in the Dark Energy Survey*. CCAPP Seminar, The Ohio State University, October 2014
- ◇ *Spectrum and Origin of the Extragalactic Gamma-ray Background AND Searching for Ultra-faint Satellite Galaxies of the Milky Way in the Dark Energy Survey*. NPAC Seminar, University of Wisconsin–Madison, October 2014
- ◇ *The Intensity of Isotropic Diffuse Emission Measured with the Fermi-LAT AND Searching for Ultra-faint Satellite Galaxies of the Milky Way in the Dark Energy Survey*. Astronomy Department Seminar, University of Illinois Urbana-Champaign, February 2014
- ◇ *Gamma Rays from Galaxies! Cosmic Rays, Dark Matter, and the Fermi-DES Connection*. CCAPP Seminar, The Ohio State University, December 2013
- ◇ *Searching for Satellite Galaxies of the Milky Way in the Dark Energy Survey*. Fermilab Center for Particle Astrophysics, September 2013
- ◇ *Unbeamed extragalactic emitters and the origin of the gamma-ray background*. Santa Cruz Institute for Particle Physics, June 2012
- ◇ *Searching for Dark Matter with the Fermi LAT*. College of William & Mary Department of Physics, March 2012
- ◇ *The Extragalactic Gamma-ray Background*. Fermilab Center for Particle Astrophysics, December 2011

Conference Presentations

- ◇ *Commissioning Science Verification Surveys and Construction Completeness*. NSF & DOE LSST Joint Status Review, Virtual, 2020 (invited speaker)
- ◇ *Impact of the Large Magellanic Cloud on the Full-sky Milky Way Satellite Population*. Cosmic Controversies, Chicago, IL, 2020
- ◇ *Commissioning Science Verification and Validation*. NSF & DOE LSST Joint Status Review, Tucson, AZ, 2019 (invited speaker)
- ◇ *Revealing the Threshold of Galaxy Formation with a Census of Milky Way Satellites Over 3/4 of the Sky*. Great Lakes Cosmology Workshop, Rochester, NY, 2019 (invited speaker)
- ◇ *Revealing the Threshold of Galaxy Formation with a Census of Milky Way Satellites Over 3/4 of the Sky*. International Cosmic Ray Conference, Madison, WI, 2019
- ◇ *CTA and LSST Synergies*. Cherenkov Telescope Array pSTC Inauguration, Tucson, AZ, 2019 (invited speaker)
- ◇ *Commissioning Science Verification and Validation*. NSF & DOE LSST Joint Status and Commissioning Review, Tucson, AZ, 2018 (invited speaker)
- ◇ *Small Galaxies, Big Science: Near-field Cosmology Opportunities in the LSST era*. SnowPAC 2018 – Big Questions, Big Surveys, Big Data: Astronomy & Cosmology in the 2020s, Snowbird, UT, 2018
- ◇ *Science with LSST*. NOAO Decadal Survey Community Planning Workshop, Tucson, AZ, 2018 (invited speaker)
- ◇ *Commissioning Science Verification and Validation*. NSF & DOE LSST Joint Status Review, Tucson, AZ, 2017 (invited speaker)

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- ◇ *Searching for Optical Counterparts for IceCube Neutrinos Using the Dark Energy Camera*. TeV Particle Astrophysics, Columbus, OH, 2017
- ◇ *Searching for Ultra-faint Galaxies in Three Years of Data from the Dark Energy Survey*. TeV Particle Astrophysics, Columbus, OH, 2017
- ◇ *Optical Surveys and Particle Astrophysics: Prospects in the LSST Era*. IceCube Particle Astrophysics Symposium, Madison, WI, 2017 (invited speaker)
- ◇ *Magellanic Satellites Survey: Searching for Hierarchical Structure Formation within the Local Group*. 229th AAS, Grapevine, TX, 2017
- ◇ *Evidence against Star-forming Galaxies as the Primary Source of IceCube Neutrinos*. TeV Particle Astrophysics, Geneva, Switzerland, 2016
- ◇ *Connections between Optical Surveys and Astro-Particle Physics*. Computing in High-Energy AstroParticle Research, Columbus, OH, 2016 (invited speaker)
- ◇ *Prospects for Associating TeV to PeV Cosmic Neutrinos with Explosive Optical Transients*. Cross-correlation Spectacular with LSST, Brookhaven National Laboratory, NY, 2016 (poster)
- ◇ *Estimating the GeV Emission of Millisecond Pulsars in Dwarf Spheroidal Galaxies*. Cross-correlation Spectacular with LSST, Brookhaven National Laboratory, NY, 2016 (poster)
- ◇ *Evidence Against Star-forming Galaxies at the Primary Source of IceCube Neutrinos*. Perspectives on the Extragalactic Frontier, Trieste, Italy, 2016 (invited speaker)
- ◇ *Searching for Milky Way Satellites from Optical to Gamma Rays*. Astrophysics of Dark Matter, Sesto, Italy, 2016 (invited speaker)
- ◇ *New Satellites of our Milky Way*. 227th AAS, Kissimmee, FL, 2016 (invited speaker, plenary talk)
- ◇ *Indirect Dark Matter Searches*. TeV Particle Astrophysics, Kashiwa, Japan, 2015 (invited speaker, plenary talk)
- ◇ *The search for dark matter annihilation in dwarf spheroidal galaxies now and in the GMT era*. Giant Magellan Telescope Community Meeting, Pacific Grove, CA (poster)
- ◇ *The Search for Milky Way Satellite Galaxies from Optical to Gamma Rays*. Topics in Underground and Particle Astrophysics, Torino, Italy, 2015 (invited speaker)
- ◇ *Searching for Ultra-faint Galaxies in the Dark Energy Survey*. Topics in Underground and Particle Astrophysics, Torino, Italy, 2015 (invited speaker)
- ◇ *Phased Arrays for Radio Detection of Ultra-high Energy Neutrinos*. International Cosmic Ray Conference, The Hague, Netherlands, 2015
- ◇ *The Search for Milky Way Satellite Galaxies from Optical to Gamma Rays*. Conference on the Intersections of Particle and Nuclear Physics, Vail, CO, 2015 (invited speaker)
- ◇ *Searching for Milky Way Satellite Galaxies in the Dark Energy Survey*. Local Group Astrostatistics, Ann Arbor, MI, 2015
- ◇ *The Search for Milky Way Satellite Galaxies from Optical to Gamma Rays*. IceCube Particle Astrophysics Symposium, Madison, WI, 2015
- ◇ *Phased Arrays for Radio Detection of Ultra-high Energy Neutrinos*. IceCube Particle Astrophysics Symposium, Madison, WI, 2015
- ◇ *Radio Detection of Ultra-high Energy Cosmic Neutrinos*. International Conference on High Energy Physics, Valencia, Spain, 2014 (invited speaker)
- ◇ *Gamma-ray Observations of Galaxy Clusters: A Brief Review*. TeV Particle Astrophysics / Identification of Dark Matter, Amsterdam, Netherlands, 2014 (invited speaker)
- ◇ *Greenland Neutrino Observatory*. Acoustic and Radio EeV Neutrino Detection Activities, Annapolis, MD, 2014 (invited speaker)
- ◇ *The Spectrum of Isotropic Diffuse Gamma-ray Emission between 100 MeV and 820 GeV*. High-Energy Messengers: Connecting the Non-thermal Extragalactic Backgrounds, Chicago, IL, 2014

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- ◇ *The Intensity and Origin of the Extragalactic Gamma-ray Background*. April APS Meeting, Savannah, GA, 2014 (invited speaker, APS Division of Astrophysics ‘Young Stars’ featured talk)
- ◇ *Searching for Satellite Galaxies of the Milky Way in the Dark Energy Survey*. Dark Matter, Los Angeles, CA, 2014 (invited speaker, plenary talk)
- ◇ *The intensity of Isotropic Diffuse Emission Measured with the Fermi-LAT*. 223rd AAS, Washington, DC, 2014
- ◇ *Selected Fermi-LAT Results from the Past Year*. IceCube Particle Astrophysics Symposium, Madison, WI, 2013 (invited speaker, plenary talk)
- ◇ *Non-thermal Emission of Star-forming Galaxies: Status and Outlook from keV to TeV Energies*. 4th International Fermi Symposium, Monterey, CA, 2012 (invited speaker, plenary talk)
- ◇ *Contribution of Unresolved Galaxies to the Extragalactic Diffuse Gamma-ray Background*. 220th AAS “Extragalactic Gamma-ray Background” Meeting in a Meeting, Anchorage, AK, 2012 (invited speaker)
- ◇ *Indirect Searches for Dark Matter with the Fermi LAT: Results After Three Years*. Brookhaven Forum 2011: A First Glimpse of the Tera Scale, Upton, NY, 2011 (invited speaker, plenary talk)
- ◇ *Cosmic-ray Connections between the Interstellar and Intergalactic Medium*. Clusters of Galaxies as Cosmic Laboratories, Stockholm, Sweden, 2011 (invited speaker)
- ◇ *GeV Observations of Star-forming Galaxies with the Fermi LAT*. Beamed and Unbeamed Gamma-rays from Galaxies, Muonio, Finland, 2011 (invited speaker, plenary talk)
- ◇ *GeV Observations of Local Group Galaxies with Fermi LAT*. Science with the New Generation of High Energy Gamma-ray Experiments, Trieste, Italy, 2010
- ◇ *Fermi LAT Detection of Gamma-ray Emission from Starburst Galaxies M82 and NGC 253*. Fermi Symposium, Washington, DC, 2009 (plenary talk)
- ◇ *GeV Gamma-ray Observations of Galaxy Clusters with the Fermi LAT*. TeV Particle Astrophysics, SLAC National Accelerator Laboratory, CA, 2009
- ◇ *GeV Gamma-ray Observations of Galaxy Clusters with the Fermi LAT*. American Physical Society April Meeting, Denver, CO, 2009
- ◇ *Strategy for Flat-fielding: Camera Calibrations, Optical Configurations, and Calculations*. LSST Camera-Wide Workshop, SLAC National Accelerator Laboratory, CA, 2008

Additional Meetings

- ◇ Detecting Dark Matter with Gamma Rays, SLAC National Accelerator Laboratory, CA, 2011
- ◇ SLAC Summer Institute: History of the Universe, SLAC National Accelerator Laboratory, CA, 2011
- ◇ Supercomputing 2010, New Orleans, LA, 2010
- ◇ Advanced Gamma-ray Imaging System (AGIS) Collaboration Meeting, Salt Lake City, UT, 2009
- ◇ SLAC Summer Institute: Cosmic Accelerators, SLAC National Accelerator Laboratory, CA, 2008
- ◇ CERN Summer Student Lecture Programme, Geneva, Switzerland, 2007

Publications

◇ LEADING CONTRIBUTOR PUBLICATIONS

Led analysis components and/or writing and/or am listed as a corresponding author. Please refer to the *Fermi-LAT Collaboration Publication Policy* (<http://www-glast.stanford.edu/policy-letter.pdf>) for LAT Collaboration papers.

- *The Dark Energy Survey Data Release 2*, T. M. C. Abbott, et al., submitted to *Astrophysical Journal Supplement Series*, arXiv:2101.05765
- *Dark Energy Survey Year 3 Results: Photometric Data Set for Cosmology*, I. Sevilla-Noarbe, K. Bechtol, et al., accepted for publication in *Astrophysical Journal Supplement Series*, arXiv:2011.03407
- *Recommended Target Fields for Commissioning the Vera C. Rubin Observatory*, A. Amon, et al., submitted to the Rubin Observatory commissioning strategy white paper call, arXiv:2010.15318

- *Milky Way Satellite Census. III. Constraints on Dark Matter Properties from Observations of Milky Way Satellite Galaxies*, E. O. Nadler, A. Drlica-Wager, K. Bechtol et al., *Physical Review Letters*, 126, 091101, 2021 (Editor's Suggestion)
- *Milky Way Satellite Census. II. Galaxy Halo Connection Constraints Including the Impact of the Large Magellanic Cloud*, E. O. Nadler, R. H. Wechsler, K. Bechtol et al., *Astrophysical Journal*, 893, 48, 2020
- *Milky Way Satellite Census. I. The Observational Selection Function for Milky Way Satellites in DES Y3 and Pan-STARRS DR1*, A. Drlica-Wager, K. Bechtol et al., *Astrophysical Journal*, 893, 47, 2020
- *A DECam Search for Explosive Optical Transients Associated with IceCube Neutrinos*. R. Morgan, K. Bechtol et al, accepted for publication in *Astrophysical Journal*, 2019
- *Dark Matter Science in the Era of LSST*. K. Bechtol et al., *Bulletin of the American Astronomical Society*, 51, 207, 2019
- *The Dark Energy Survey Data Release 1*. T. M. C. Abbott et al., *Astrophysical Journal Supplement Series*, 239, 18, 2018
- *Searching for Dark Matter Annihilation in Recently Discovered Milky Way Satellites with Fermi-LAT*. A. Albert et al., *Astrophysical Journal*, 834, 110, 2017
- *Evidence against star-forming galaxies as the dominant source of IceCube neutrinos*. K. Bechtol et al., *Astrophysical Journal*, 836, 47, 2017
- *An Ultra-Faint Galaxy Candidate Discovered in Early Data from the Magellanic Satellites Survey*. A. Drlica-Wagner, K. Bechtol, et al., *Astrophysical Journal Letters*, 833, L5, 2016
- *Estimating the GeV Emission of Millisecond Pulsars in Dwarf Spheroidal Galaxies*. M. Winter, G. Zaharijas, K. Bechtol, & J. Vandenbroucke, *Astrophysical Journal Letters*, 832, L6, 2016
- *A Technique for Detection of PeV Neutrinos Using a Phased Radio Array*. A. G. Vieregg, K. Bechtol, & A. Romero-Wolf, *Journal of Cosmology and Astroparticle Physics*, 02, 005, 2016
- *Eight Ultra-faint Galaxy Candidates Discovered in Year Two of the Dark Energy Survey*. A. Drlica-Wagner, K. Bechtol et al., *Astrophysical Journal*, 813, 109, 2015
- *Search for Gamma-Ray Emission from DES Dwarf Spheroidal Galaxy Candidates with Fermi-LAT Data*. A. Drlica-Wagner, A. Albert, K. Bechtol et al., *Astrophysical Journal*, 809, 4, 2015
- *Eight New Milky Way Companions Discovered in First-year Dark Energy Survey Data*. K. Bechtol et al., *Astrophysical Journal*, 807, 50, 2015
- *The spectrum of isotropic diffuse gamma-ray emission between 100 MeV and 820 GeV*. M. Ackermann et al., *Astrophysical Journal*, 799, 86, 2015
- *Prospects for Detecting Gamma Rays from Annihilating Dark Matter in Dwarf Galaxies in the Era of DES and LSST*. C. He, K. Bechtol, A. Hearin, & D. Hooper, *Physical Review D*, 91, 063515, 2015
- *GeV Observations of Star-forming Galaxies with the Fermi LAT*. M. Ackermann et al., *Astrophysical Journal*, 755, 164, 2012
- *Search for gamma-ray emission from X-ray selected Seyfert galaxies with Fermi-LAT*. M. Ackermann et al., *Astrophysical Journal*, 747, 104, 2012
- *TARGET: A multi-channel digitizer chip for very-high-energy gamma-ray telescopes*. K. Bechtol, et al., *Astroparticle Physics*, 36, 156, 2012
- *Fermi Large Area Telescope Observations of Local Group galaxies: Detection of M31 and search for M33*. A.A. Abdo et al., *Astronomy & Astrophysics*, 523, L2, 2010
- *GeV Gamma-ray Flux Upper Limits from Clusters of Galaxies*. M. Ackermann et al., *Astrophysical Journal Letters*, 717, L71, 2010
- *Detection of Gamma-Ray Emission from the Starburst Galaxies M82 and NGC 253 with the Large Area Telescope on Fermi*. A.A. Abdo et al., *Astrophysical Journal Letters*, 709, L152, 2010

◇ SELECTED CO-AUTHOR PUBLICATIONS

Generated text, served as internal reviewer, wrote software used for analyses, produced plots, cross-checked analyses, or performed directly related observations/instrumentation work.

- *Documentation automation for the verification and validation of Rubin Observatory software.* G. Comoretto et al., Proc. SPIE 11450, Modeling, Systems Engineering, and Project Management for Astronomy IX, 114500E, 2020
- *Vera C. Rubin Observatory system integration, test, and commissioning: strategy and status.* J. Sebag et al., Proc. SPIE 11445, Ground-based and Airborne Telescopes VIII, 114451U, 2020
- *Dark Energy Survey Year 3 Results: Calibration of Lens Sample Redshift Distributions using Clustering Redshifts with BOSS/eBOSS,* R. Cawthon et al., submitted, arXiv:2012.12826, 2020
- *Dark Energy Survey Year 3 Results: Point-Spread Function Modeling,* M. Jarvis et al., Monthly Notices of the Royal Astronomical Society, 501, 1282, 2021
- *Dark Energy Survey Year 3 Results: Deep Field Optical + Near-Infrared Images and Catalogue,* W. G. Hartley et al., submitted, arXiv:2012.12824
- *Dark Energy Survey Year 3 Results: Measuring the Survey Transfer Function with Balrog,* S Everett et al., submitted, arXiv:2012.12825
- *Constraints on the Physical Properties of GW190814 through Simulations Based on DECam Follow-up Observations by the Dark Energy Survey,* R. Morgan et al., Astrophysical Journal, 901, 83, 2020
- *Optical follow-up of gravitational wave triggers with DECam during the first two LIGO/VIRGO observing runs.* K. Herner et al., Astronomy and Computing, 33, 100425, 2020
- *The Southern Stellar Stream Spectroscopic Survey (S^5): Overview, Target Selection, Data Reduction, Validation, and Early Science.* T. S. Li et al., Monthly Notices of the Royal Astronomical Society, 490, 3508 (2019)
- *Detection of cross-correlation between gravitational lensing and gamma rays.* S. Ammazzalorso et al., submitted to arXiv:1907.13484
- *The Morphology and Structure of Stellar Populations in the Fornax Dwarf Spheroidal Galaxy from Dark Energy Survey Data.* M. Y. Wang et al., Astrophysical Journal, 881, 118, 2019
- *Identification of RR Lyrae Stars in Multiband, Sparsely Sampled Data from the Dark Energy Survey Using Template Fitting and Random Forest Classification.* Astronomical Journal, 158, 16, 2019
- *Astro2020 APC White Paper: Pursuing diversity, equity, and inclusion in multimessenger astronomy collaborations over the coming decade.* E. Bechtol et al., submitted to the Astro2020 Decadal Survey APC White Paper call, arXiv:1907.06970
- *A Faint Halo Star Cluster Discovered in the Blanco Imaging of the Southern Sky Survey.* S. Mau et al., Astrophysical Journal, 875, 154, 2019
- *Probing the Fundamental Nature of Dark Matter with the Large Synoptic Survey Telescope.* A. Drlica-Wagner et al., arXiv:1902.01055
- *Hyper Wide Field Imaging of the Local Group Dwarf Irregular Galaxy IC 1613: An Extended Component of Metal-poor Stars.* R. Pucha et al., Astrophysical Journal, 880, 104, 2019
- *Star-galaxy classification in the Dark Energy Survey Y1 data set.* I. Sevilla-Noarbe et al., Monthly Notices of the Royal Astronomical Society, 481, 5451, 2018
- *Multimessenger observations of a flaring blazar coincident with high-energy neutrino IceCube-170922A.* M. G. Aartsen et al., Science, 361, eaat1378, 2018
- *The First Tidally Disrupted Ultra-Faint Dwarf Galaxy? - Spectroscopic Analysis of the Tucana III Stream.* T. S. Li et al., accepted to Astrophysical Journal, arXiv:1804.07761
- *Constraints on the diffuse high-energy neutrino flux from the third flight of ANITA.* P. W. Gorham et al., Physical Review D, 98, 022001, 2018
- *Observation of an Unusual Upward-going Cosmic-ray-like Event in the Third Flight of ANITA.* P. W. Gorham et al., Physical Review Letters, 121, 161102, 2018

- *Ships Passing in the Night: Spectroscopic Analysis of Two Ultra-Faint Satellites in the Constellation Carina.* T. S. Li et al., submitted to *Astrophysical Journal*, arXiv:1802.06810
- *Stellar Streams Discovered in the Dark Energy Survey.* N. Shipp et al., submitted to *Astrophysical Journal*, arXiv:1801.03097
- *The Dark Energy Survey Image Processing Pipeline,* E. Morganson et al., accepted to *Publications of the Astronomical Society of the Pacific*, arXiv:1801.03177
- *Mapping the Tidal Destruction of the Hercules Dwarf: A Wide-field DECam Imaging Search for RR Lyrae Stars,* C. Garling et al., *Astrophysical Journal*, 852, 44, 2018
- *Dark Energy Survey Year 1 Results: Photometric Data Set for Cosmology.* A. Drlica-Wagner et al., accepted to *Astrophysical Journal Supplement*, arXiv:1708.01531
- *Discovery of two neighboring satellites in the Carina constellation with MagLiteS.* Torrealba et al. 2018, *Monthly Notices of the Royal Astronomical Society*, 475, 5085.
- *Evidence for Dynamically Driven Formation of the GW170817 Neutron Star Binary in NGC 4993.* A. Palmese et al., *Astrophysical Journal Letters*, 849, 2, 2017
- *Nearest Neighbor: The Low-Mass Milky Way Satellite Tucana III.* J. Simon et al., *Astrophysical Journal*, 838, 11, 2017
- *Farthest Neighbor: The Distant Milky Way Satellite Eridanus II.* T. S. Li et al., *Astrophysical Journal*, 838, 8, 2017
- *The Dark Energy Survey view of the Sagittarius stream: Discovery of two faint stellar system candidates.* E. Luque et al. 2016, *Monthly Notices of the Royal Astronomical Society*, 468, 97, 2017
- *Development Toward a Ground-Based Interferometric Phased Array for Radio Detection of High Energy Neutrinos.* J. Avva et al., *Nuclear Instruments and Methods in Physics Research*, 869, 46, 2017
- *The Dark Energy Survey: more than dark energy – an overview.* T. Abbott et al., *Monthly Notices of the Royal Astronomical Society*, 460, 1270, 2016
- *Resolving the Extragalactic γ -ray Background above 50 GeV with Fermi-LAT.* M. Ackermann et al., *Physical Review Letters*, 116, 151105, 2016
- *Limits on dark matter annihilation signals from the Fermi LAT 4-year measurement of the isotropic gamma-ray background.* M. Ackermann et al., *Journal of Cosmology and Astroparticle Physics*, 9, 008, 2015
- *Discovery of a Stellar Overdensity in Eridanus-Phoenix in the Dark Energy Survey.* T. Li et al., *Astrophysical Journal*, 817, 135, 2016
- *Digging deeper into the Southern skies: a compact Milky-Way companion discovered in first-year Dark Energy Survey data.* *Monthly Notices of the Royal Astronomical Society*, 458, 603, 2016
- *Search for Gamma-ray Emission from the Coma Cluster with Six Years of Fermi-LAT Data.* M. Ackermann et al., *Astrophysical Journal*, 819, 149, 2016
- *Accelerator measurements of magnetically-induced radio emission from particle cascades with applications to cosmic-ray air showers.* K. Belov et al., *Physical Review Letters*, 116, 141103, 2016
- *Stellar Kinematics and Metallicities in the Ultra-faint Dwarf Galaxy Reticulum II.* J. Simon et al., *Astrophysical Journal*, 808, 95, 2015
- *The Origin of the Extragalactic Gamma-Ray Background and implications for Dark-Matter Annihilation.* M. Ajello et al., *Astrophysical Journal Letters*, 800, 27, 2015
- *Gamma-ray flaring activity from the gravitationally lensed blazar PKS 1830-211 observed by Fermi LAT.* A. A. Abdo et al., *Astrophysical Journal*, 799, 143, 2015
- *Spatially Resolving a Starburst Galaxy at Hard X-ray Energies: NuSTAR, Chandra, and VLBA observations of NGC 253.* D. R. Wik et al., *Astrophysical Journal*, 797, 79, 2014

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- *Mass and galaxy distributions of four massive galaxy clusters from Dark Energy Survey Science Verification data.* P. Melchior et al., Monthly Notices of the Royal Astronomical Society, 449, 2219, 2015
 - *Search for Cosmic-Ray-induced Gamma-Ray Emission in Galaxy Clusters.* M. Ackermann et al., Astrophysical Journal, 787, 18A, 2014
 - *Inferred Cosmic-Ray Spectrum from Fermi Large Area Telescope γ -Ray Observations of Earth's Limb.* M. Ackermann et al., Physical Review Letters, 112, 151103, 2014
 - *Discovery of GeV Emission from the Circinus Galaxy with the Fermi Large Area Telescope.* M. Hayashida et al., Astrophysical Journal, 779, 131H, 2013
 - *The Fermi All-sky Variability Analysis: A List of Flaring Gamma-Ray Sources and the Search for Transients in Our Galaxy.* M. Ackermann et al., Astrophysical Journal, 771, 57, 2013
 - *Detection of the Characteristic Pion-Decay Signature in Supernova Remnants.* M. Ackermann et al., Science, 339, 807A, 2013
 - *Search for Spatially Extended Fermi-LAT Sources Using Two Years of Data.* J. Lande et al., Astrophysical Journal, 756, 5L, 2012
 - *Fermi Large Area Telescope Observation of Supernova Remnant S147.* J. Katsuta et al., Astrophysical Journal, 752, 135, 2012
 - *Fermi-LAT Detection of the Young Supernova Remnant Tycho.* F. Giordano et al., Astrophysical Journal, 744, L2, 2012
 - *Discovery of a GeV blazar shining through the Galactic plane.* J. Vandenbroucke et al., Astrophysical Journal Letters, 718, L166, 2010
 - *Fermi Large Area Telescope Observations of the Vela-X Pulsar Wind Nebula.* A.A. Abdo et al., Astrophysical Journal, 713, 146, 2010
 - *Observation of Supernova Remnant IC 443 with the Fermi Large Area Telescope.* A.A. Abdo et al., Astrophysical Journal, 712, 459, 2010
 - *Fermi-LAT Discovery of GeV Gamma-Ray Emission from the Young Supernova Remnant Cassiopeia A.* A.A. Abdo et al., Astrophysical Journal Letters, 710, L92, 2010
 - *Fermi Large Area Telescope Gamma-Ray Detection of the Radio Galaxy M87.* A.A. Abdo et al., Astrophysical Journal, 707, 55, 2009
 - *The on-orbit calibration of the Fermi Large Area Telescope.* A.A. Abdo et al., Astroparticle Physics, 32, 193, 2009
 - *The magnetized steel and scintillator calorimeters of the MINOS experiment.* D.G. Michael et al., Nuclear Instruments and Methods in Physics Research A, 596, 190, 2008
 - Co-author on over 150 Fermi-LAT Collaboration published journal articles
- ◇ SELECTED CONFERENCE PROCEEDINGS AND MISCELLANEOUS
- *Development of an ASIC for Dual Mirror Telescopes of the Cherenkov Telescope Array.* J. Vandenbroucke et al., in 32nd International Cosmic Ray Conference Proceedings, 2011
 - *The Advanced Gamma-ray Imaging System (AGIS) - Camera Electronics Development.* H. Tajima et al., in American Astronomical Society/High Energy Astrophysics Division Proceedings, 2010

**Leadership
Roles within
Science
Collaborations
and Projects**

- ◇ *Dark Energy Science Collaboration*, Deputy Technical Coordinator, 2021–present
- ◇ *Nancy Grace Roman Space Telescope*, Roman Science Interest Group, 2020–present
- ◇ *Vera C. Rubin Observatory*, Commissioning Science Verification and Validation Lead, 2017–present
- ◇ *Vera C. Rubin Observatory*, Organizer of monthly Diversity, Equity, and Inclusion Discussion Series, 2020-2021
- ◇ *Dark Energy Science Collaboration*, Dark Matter Working Group Coordinator, 2019–2021

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- ◇ *Dark Energy Science Collaboration*, Collaboration Council Member, 2018–present
 - ◇ *Dark Energy Survey*, External Collaboration Committee, 2018–present
 - ◇ *Dark Energy Survey*, Milky Way Working Group Coordinator, 2019–present
 - ◇ *Dark Energy Survey*, Science Release Group Coordinator, 2017–present
 - ◇ *Dark Energy Survey*, Coordinator of Interstellar Extinction Task Force, 2016–present
 - ◇ *Magellanic Satellites Survey*, Principle Investigator, 2015–present
 - ◇ *Dark Energy Survey*, Co-coordinator of Milky Way Satellites Sub-group, 2015–2019
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**Grants and
Other Support**

- ◇ Vera C. Rubin Observatory Project support to carry out duties as Commissioning Science Verification and Validation Lead, 2019-2020, \$99,709
 - ◇ WARF Fall Research Competition 2020 *Identifying the Visible-light Counterparts of Multimessenger Signals*, 2021-2022, \$47786
 - ◇ NSF Astronomy and Astrophysics Research Grants, *Advancing the Search for Isolated Pure Dark Matter Halos*, 2020-2023, \$485,000
 - ◇ DOE FY 2020 Research Opportunities in High Energy Physics, *High Energy Physics Research: Experimental and Theoretical*, 2020-2023, \$345,000
 - ◇ WARF Fall Research Competition 2019 *Using the Smallest Galaxies to Study the Fundamental Nature of Dark Matter*, 2020-2021, \$41,879
 - ◇ Large Synoptic Survey Telescope Project support to carry out duties as Commissioning Science Verification and Validation Lead, 2018-2019, \$13,800
 - ◇ DOE FY 2019 Research Opportunities in High Energy Physics, *Science Validation for Dark Energy Research with Optical Imaging Surveys*, 2019-2020, \$80,000
 - ◇ WARF Fall Research Competition 2018 *From Pixels to Precision Measurements of Dark Energy*, 2019-2020, \$39,137
 - ◇ NASA *Fermi* Cycle-9 Guest Investigator Program, *Search for Dark Matter Annihilation in Newly Discovered Milky Way Satellite Galaxies*, 2016 (co-I)
 - ◇ NASA *Fermi* Cycle-3 Guest Investigator Program, *Understanding the Origin of the Extragalactic Gamma-ray Background*, 2010 (co-II)
 - ◇ NASA *Fermi* Cycle-2 Guest Investigator Program, *Fermi Observations of Clusters of Galaxies and Theoretical Interpretation*, 2009 (co-I)
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**Selected
Observing
Proposals**

- ◇ *A new DECam deep field covering the full Euclid Deep Field South*. Blanco/DECam, Cerro Tololo Inter-American Observatory, 2020B (Principle Investigator)
- ◇ *The Magellanic Satellites Survey Phase 2*. Blanco/DECam, Cerro Tololo Inter-American Observatory, 2018-2019 (multi-year proposal, Principle Investigator)
- ◇ *Revealing the Sources of High-Energy Astrophysical Neutrinos*. Gemini/GMOS-S, Gemini Observatory, 2017B (Principle Investigator)
- ◇ *Revealing the Sources of High-Energy Astrophysical Neutrinos*. Blanco/DECam, Cerro Tololo Inter-American Observatory, 2017B, 2018A, 2018B, 2019A, 2020B (Principle Investigator)
- ◇ *The Magellanic Satellites Survey*. Blanco/DECam, Cerro Tololo Inter-American Observatory, 2016-2017 (multi-year proposal, Principle Investigator)
- ◇ *The Lowest Luminosity Star-Forming Galaxy*. Magellan-Baade/IMACS, Las Campanas Observatory, 2015 (Principle Investigator)
- ◇ *The Lowest Luminosity Star-Forming Galaxy*. ACS, WFC3, *Hubble* Cycle-23 Guest Observer Program, 2015

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- ◇ *Unveiling the southern Halo with DES: detailed observations of the Tucana II, Horologium I, and the Phoenix stream.* VLT/FLAMES, European Southern Observatory, 2015
 - ◇ *Spectroscopic Follow-Up of New Milky Way Dwarf Satellite Galaxies.* Director's Discretionary Time, AAT/2dF+AAOmega, Australian Astronomical Observatory, 2015
 - ◇ *Empowering Precision Cosmology through Accurate Cluster Mass Calibration.* Magellan-Clay/MegaCam, Las Campanas Observatory, 2013 (Principle Investigator)
 - ◇ *Broad-band (0.5–30 keV) X-ray imaging of starburst galaxies with Chandra and NuSTAR.* Chandra Cycle-13 General Observer Program, 2011
 - ◇ *Suzaku observations of Seyfert galaxies as gamma-ray source candidates selected from the Swift-BAT catalogue.* Suzaku Cycle-6 Guest Observer Program, 2011
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Observing and Fieldwork Experience

- ◇ DECam, Blanco 4 m telescope, Cerro Tololo Inter-American Observatory, November 2020
 - ◇ DECam, Blanco 4 m telescope, Cerro Tololo Inter-American Observatory, February 2019
 - ◇ DECam, Blanco 4 m telescope, Cerro Tololo Inter-American Observatory, February 2016
 - ◇ IMACS, Magellan-Baade 6.5 m telescope, Las Campanas Observatory, Chile, November 2015
 - ◇ DECam, Blanco 4 m telescope, Cerro Tololo Inter-American Observatory, November 2015
 - ◇ ANITA-III long-duration balloon flight, McMurdo Station, Antarctica, November–December 2014
 - ◇ DECam, Blanco 4 m telescope, Cerro Tololo Inter-American Observatory, Chile, October–November 2014
 - ◇ ANITA-III payload integration, Columbia Scientific Balloon Facility, TX, July 2014
 - ◇ Experiment T-510 Beam Test, measuring radio frequency emission from cascades of secondary particles in a dense medium in the presence of a magnetic field to validate the models used to study the radio emission from extensive air showers caused by ultra-high energy cosmic rays in the Earth atmosphere, SLAC National Accelerator Laboratory, CA, January 2014
 - ◇ MegaCam, Magellan-Clay 6.5 m telescope, Las Campanas Observatory, Chile, September 2013
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Workshop and Conference Organization

- ◇ Scientific Organizing Committee, *Rubin-Athena Synergy Workshop*, Virtual, 2021
 - ◇ Scientific Organizing Committee, *Rubin Observatory Project and Community Workshop*, Virtual, 2020
 - ◇ Scientific Organizing Committee, *LSST Project and Community Workshop*, Tucson, AZ, 2019
 - ◇ Scientific Organizing Committee, *LSST Dark Matter Workshop*, Chicago, IL, 2019
 - ◇ Lead Organizer, *LSST Commissioning Science Verification Test Specifications Workshop*, Tucson, AZ, 2019
 - ◇ Lead Organizer, *LSST Commissioning Science Verification bootcamp: Instrument Signature Removal*, SLAC National Accelerator Laboratory, CA, 2018
 - ◇ Conference Organizing Committee, *Probing the Nature of Dark Matter with LSST*, Lawrence Livermore National Laboratory, CA, 2018
 - ◇ Lead Organizer, *LSST Commissioning Science Verification bootcamp: LSST Science Platform*, Tucson, AZ, 2018
 - ◇ Scientific Organizing Committee, *SnowPAC 2018 – Big Questions, Big Surveys, Big Data: Astronomy & Cosmology in the 2020s*, decadal survey planning workshop for the ground-based optical and NIR survey community, 2018
 - ◇ Lead Organizer, *High-Energy Messengers: Connecting the Non-thermal Extragalactic Backgrounds*, Chicago, IL, 2014
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Seminar Organization

- ◇ *WIPAC Journal Club*, organize weekly discussion of recent astrophysics papers and events, 2015–2016

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- ◇ *KICP Friday Seminars*, selected, invited, and hosted speakers, 2013–2014
 - ◇ *KICP “Thunch” Journal Club*, organized weekly lunchtime discussion of recent astrophysics papers and events, 2012–2015
 - ◇ Meeting of Astrophysics Students at Stanford, seminar organizer, 2010
 - ◇ SLAC Association for Student Seminars, seminar coordinator for the only student-run organization at the SLAC National Accelerator Laboratory, 2009
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Department Service

- ◇ Graduate Program Committee, 2020–present
 - ◇ Graduate Admissions Committee, 2018–present
 - ◇ Colloquium Committee, 2018–present
 - ◇ Organizer of Leach Fellows undergraduate research scholarship in Physics Department at the University of Wisconsin Madison to provide paid research opportunities for studies from historically underrepresented backgrounds in physics, managing \$20,000 budget, 2021–
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Service to Physics Community

- ◇ Review Panelist for DOE, NSF, NASA
 - ◇ Review Panelist, LSST Science Platform Final Design Review, 2019
 - ◇ Multimessenger Diversity Network, LSST representative to network promoting diversity, equity, and inclusion efforts within large scientific collaborations, 2018–present
 - ◇ Visited Congressional and Executive offices in Washington, DC to advocate for fundamental scientific research in the United States, representing the SLAC Users Organization, 2012, 2013
 - ◇ Reviewer for *Nature*, *Physical Review Letters*, *Physical Review D*, *Astrophysical Journal Letters*, *Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*, *Journal of Cosmology and Astroparticle Physics*
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Teaching

- ◇ Classical Mechanics, University of Wisconsin-Madison, Fall 2021
 - ◇ Introduction to Modern Physics, University of Wisconsin-Madison, Fall 2020
 - ◇ General Physics – Electricity and Magnetism, University of Wisconsin-Madison, Spring 2020
 - ◇ Modern Physics for Engineers, University of Wisconsin-Madison, Fall 2019
 - ◇ Modern Physics for Engineers, University of Wisconsin-Madison, Spring 2019
 - ◇ Introduction to Modern Physics, University of Wisconsin-Madison, Fall 2018
 - ◇ Madison Teaching and Learning Excellence Fellow, weekly meeting of early-career faculty sharing teaching best practices, 2018-2019
 - ◇ Small Group Evaluation Facilitator, Stanford University, conduct student interviews and provide feedback for teaching assistants, consultation and professional development for teaching assistants, 2010
 - ◇ Teaching Assistant Mentor, Stanford University, implementation of active participatory learning techniques in introductory physics courses, discussion section planning, 2009
 - ◇ Teaching Assistant, Stanford University
 - Thermodynamics and Foundations of Modern Physics, for physics majors, Spring 2008
 - Mechanics, for engineering students, Winter 2008
 - Light and Heat Laboratory, for engineering students, Autumn 2007
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Postdoc Supervision

- ◇ Peter Ferguson, University of Wisconsin–Madison, commissioning science validation for Rubin Observatory with an emphasis on enabling accurate cosmology with early LSST data, Fall 2021–present

- ◇ Yjan Gordon, University of Wisconsin–Madison, strong gravitational lensing including lens finding in optical and radio surveys, analysis of high-resolution follow-up imaging (radio, sub-mm, and/or optical), and lens modeling; astrophysical probes of dark matter, Fall 2021–present
 - ◇ Ross Cawthon, University of Wisconsin–Madison, cosmology from large-scale structure in galaxy surveys and lensing of the cosmic microwave background, photometric redshift validation, Fall 2018–present
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**Graduate
Student
Supervision**

- ◇ Megan Tabbutt, University of Wisconsin–Madison, large-scale structure, Spring 2020–present
 - ◇ Jimena Gonzalez Lozano, University of Wisconsin–Madison, strong lensing analyses in DES, Spring 2019–present
 - ◇ Mitch McNanna, University of Wisconsin–Madison, ultra-faint galaxy searches in DES, Fall 2018–present
 - ◇ Robert Morgan, University of Wisconsin–Madison, optical follow-up of gravitational wave and high-energy neutrino events, strong gravitational lensing in DES, Fall 2017–present
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**Undergrad
Student
Supervision**

- ◇ Adam Shandonay, University of Wisconsin–Madison, machine-learning classification of difference image analysis sources in DES, Spring 2020–present
 - ◇ William Ortolá, University of Wisconsin–Madison, fitting the reddening law for interstellar extinction in DES footprint, Fall 2019–present
 - ◇ Jacqueline Beran, University of Wisconsin–Madison, optical follow-up feasibility for new IceCube real-time alert streams, Summer 2019–present
 - ◇ Alex Krzystron, University of Wisconsin–Madison, predicting large-scale structure from cosmological models, Spring 2019–Summer 2019
 - ◇ Ethan Grover, University of Wisconsin–Madison, searching for Milky Way satellites in DECaLS, Spring 2019–Summer 2019
 - ◇ Diana Li, University of Wisconsin–Madison, LSST Stack Club, Fall 2018–Spring 2019
 - ◇ Paul Williams, University of Chicago, interactive tool to search for stellar over-densities in DES data, Winter 2014–Spring 2015
 - ◇ Georgia Virginia Panopoulos, University of Crete, validation of *Fermi*-LAT effective area and cosmic-ray background contamination, Summer 2011
 - ◇ Ariel Levi Simons, Science Teacher And Researcher program at SLAC, testing of camera readout electronics for atmospheric Cherenkov telescopes, Summer 2010
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Outreach

- ◇ Supervisor for 11th Grade High School Science Research Internship Program, Summer 2019
 - Sylvia Greene, precision astrometry and photometry for ultra-faint galaxy searches
 - Simone Vorperian, star selection for accurate PSF modeling
- ◇ Guest speaker for “Wednesday Nite @ The Lab”, *The Big Picture: Science and Public Outreach with Astronomical Surveys*, April 2019
- ◇ Guest speaker for “Space Drafts”, the Tucson Arizona chapter of “Astronomy on Tap”, *Searching for the Universe’s most energetic particles from a balloon over Antarctica*, April 2018
- ◇ Keynote speaker for total solar eclipse special event, Rabun Gap-Nacoochee School, GA, *Light and Shadows: the Eclipse and other Cosmic Wonders*, August 2017
- ◇ High-school Internship Instructor, Wisconsin IceCube Particle Astrophysics Center, University of Wisconsin–Madison, lead designer and instructor for a dozen high-school students making simple N-body simulations, weekly, September–December 2015
- ◇ Guest speaker for 80th Compton Lecture Series, Enrico Fermi Institute, University of Chicago, *Dark Energy: An Experimental Perspective*, October 2014

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- ◇ Guest lecture for “Leading Edge” undergraduate course, School of the Art Institute, IL, *Searching for the Darkest Galaxies*, January 2014
 - ◇ Instructor, “Yerkes Winter Institute: Transforming Energy”, KICP Space Explorers, designed and taught laboratory on *Rube Goldberg Machines* for high-school students, December 2014
 - ◇ Astronomy Conversations Presenter, Adler Planetarium, informal interactions with museum visitors using a variety of science visualization technologies, typically once per month, 2012–2014
 - ◇ Tour Guide, SLAC National Accelerator Laboratory, lead public and special events tours of the laboratory for visitors, typically several times per month, 2009–2012
 - ◇ English language tutor for custodians at Stanford University, twice weekly lessons, 2007–2012
 - ◇ Public lecture for Palo Alto Libraries Summer Reading Program, *Evidence for the Big Bang*, July 2011
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