

## RESEARCH INTERESTS

Development of next generation cosmic microwave background polarimeters. Receiver and focal plane technology development for kilo-pixel detector millimeter and sub-millimeter instruments. Ultra-high energy physics of the early universe, structure formation, general cosmology.

## EDUCATION

- University of California, Berkeley, Berkeley, CA — Ph.D. in Physics, 2012  
Thesis: *Design and Characterization of the POLARBEAR receiver.*  
Advisor: Adrian T. Lee
- University of California, Berkeley, Berkeley, CA — M.A. in Physics, 2006
- Princeton University, Princeton NJ — A.B. in Physics, *summa cum laude*, 2003  
Thesis: *SQUID Multiplexing for the Millimeter Bolometer Array Camera*  
Advisor: Lyman Page

## HONORS AND AWARDS

- Princeton Fellowship in Experimental Physics (Dicke Fellow) 2012
- NASA Postdoctoral Fellowship (declined) 2012
- NASA Graduate Student Research Program Fellowship 2004-2006
- National Science Foundation Graduate Program honorable mention 2003, 2004
- Allen G. Shenstone prize in experimental physics, Princeton University, 2003
- Member, Sigma Xi Scientific Research Society, since June 2003

## RESEARCH EXPERIENCE

- SPIDER 2012-present: Managing the integration of a 6 camera, several kilopixel cryogenic receiver with a lightweight gondola for an Antarctic long-duration stratospheric balloon flight.
- POLARBEAR 2003-present: Led the design, integration and deployment of the 1200 bolometer camera for POLARBEAR. Responsible for all cryogenics, milliKelvin structural and wiring design, full systems integration, receiver characterization and deployment logistics for both our eastern Sierras engineering run and our initial deployment to Chile. Managed and contributed to software development teams working on instrument control and data analysis.
- APEX-SZ 2003-2004: Responsible for milliKelvin focal plane structural design and construction.

## PUBLICATIONS

### Refereed Journal articles

1. POLARBEAR Collaboration, 2013, "A Measurement of the Cosmic Microwave Background B-Mode Polarization Power Spectrum at Sub-Degree Scales with POLARBEAR" arXiv:1403.2369, *Astrophysical Journal*, **794**, 171
2. POLARBEAR Collaboration, 2013, "Measurement of the Cosmic Microwave Background Polarization Lensing Power Spectrum with the POLARBEAR experiment" arXiv:1312.6646, *Phys. Rev. Lett.*, **113**, 021301
3. POLARBEAR Collaboration, 2013, "Evidence for Gravitational Lensing of the Cosmic Microwave Background Polarization from Cross-correlation with the Cosmic Infrared Background" arXiv:1312.6645, *Phys. Rev. Lett.* **112**, 131302
4. Dobbs, M. A., Lueker, M., et al (2012). "Frequency multiplexed superconducting quantum interference device readout of large bolometer arrays for cosmic microwave background measurements", *Rev. Sci. Instrum.* **83** p 073113
5. Schwan, et al (2011). Invited Article: "Millimeter-wave bolometer array receiver for the Atacama pathfinder experiment Sunyaev-Zel'dovich (APEX-SZ) instrument" *Rev. Sci. Instrum.* **82** p 091301
6. Halverson, N., Lanting, T., Ade, P., Basu, K., Bender, A., Benson, B., et al. (2009). "Sunyaev-Zel'Dovich Effect Observations of the Bullet Cluster (1E 0657–56) with APEX-SZ" *The Astrophysical Journal* , **701**, p 42.
7. Nord, M., Basu, K., Pacaud, F., et al (2009) "Multi-frequency imaging of the galaxy cluster Abell 2163 using the Sunyaev-Zel'dovich Effect" *Astronomy and Astrophysics*, **506**, p 623
8. Dobbs, M., Halverson, N., Ade, P., Basu, K., Beelen, A., Bertoldi, F., et al. (2006). "APEX-SZ first light and instrument status" *New Astronomy Reviews* , **50**, p 960.
9. Fowler, J., Doriese, W., Marriage, T., Tran, C., et al. (2005). "Cosmic Microwave Background Observations with a Compact Heterogeneous 150 GHz Interferometer in Chile" *The Astrophysical Journal Supplement Series* , **156**, 1.

### Conference proceedings

1. Rahlin, et al. (2014). Pre-flight integration and characterization of the SPIDER balloon-borne telescope, *Proceedings of the SPIE*, Volume 9153
2. Arnold, et al. (2014). The Simons Array: expanding POLARBEAR to three multi-chroic telescopes, *Proceedings of the SPIE*, Volume 9153

3. Inoue, et al. (2014). Thermal and optical characterization for POLARBEAR-2 optical system, *Proceedings of the SPIE*, Volume 9153
4. Barron, et al. (2014). Development and characterization of the readout system for POLABREAR-2, *Proceedings of the SPIE*, Volume 9153
5. Kermish, et al. (2012). The POLARBEAR experiment, *Proceedings of the SPIE*, Volume 8452
6. Arnold, et al. (2012). The bolometric focal plane array of the POLARBEAR CMB experiment, *Proceedings of the SPIE*, Volume 8452
7. Tomaru, et al. (2012). The POLARBEAR-2 experiment, *Proceedings of the SPIE*, Volume 8452
8. Matsumura, et al. (2012). The POLARBEAR-2 optical and polarimeter designs, *Proceedings of the SPIE*, Volume 8452
9. Arnold, et al. (2010). The POLARBEAR CMB polarization experiment, *Proceedings of the SPIE*, Volume 7741
10. Lee, A., et al. (2008). POLARBEAR: Ultra-high Energy Physics with Measurements of CMB Polarization. *KEK COSMOPHYSICS GROUP INAUGURAL CONFERENCE "ACCELERATORS IN THE UNIVERSE": Interplay between High Energy Physics and Cosmophysics. AIP Conference Proceedings , 1040, p 66.*