Brian Koopman

Contact Information

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Education

Cornell University - Ithaca, NY
Ph.D., Physics (Advisor: Prof. Michael Niemack) **In Progress**
M.S., Physics **In Progress**

Clark University - Worcester, MA
B.A., *summa cum laude*, with highest honors in Physics and Math **May 2012**
GPA: 3.96 on a 4.00 scale

Research Interests

Study of the of cosmic microwave background (CMB). Current work includes hardware development for future upgrades to the Atacama Cosmology Telescope Polarimeter, ACTPol, a CMB telescope located in the Atacama Desert in Chile. This work includes optics design, detector assembly and measurement, nanofabrication and general data analysis.

Honors and Awards

NASA Space Technology Research Fellow, NASA **2013 – Present**

Dean's List - First Academic Honors, Clark University **2008 – 2012**

Roy S. Andersen '43 Award, Clark University **2009**

Albert C. Erickson '30 Summer Research Award, Clark University **2009 – 2010**

Erickson Award for the Academic Year, Clark University **2010 – 2011**

Research Experience

Graduate Researcher, Cornell University, Ithaca, NY 14850 **December 2012 – Present**

Conducting research in observation cosmology, specifically working with the Atacama Cosmology Telescope Polarimeter as I work towards my thesis.

Student Researcher, Clark University, Worcester, MA 01601 **Sept. 2011 – May 2012**

Conducted research in experimental condensed matter, specifically Scanning Tunneling Microscopy (STM), under the guidance of Prof. Michael Boyer. Aided in construction of the new STM laboratory. Performed analysis of Fe doped $Bi_2Sr_2CaCu_2O_{8+x}$ (Bi-2212) using custom software written for IDL.

Caltech REU Student, LIGO Livingston, Livingston, LA 70754 **Summer 2011**

Researched piezoelectric actuators for use in the Output Mode Cleaner (OMC) of the Laser Interferometer Gravitational Wave Observatory (LIGO) under the guidance of Dr. Valera Frolov. Participated in optical path construction and alignment of experimental OMC with non-linear planar ring oscillator (NPRO), Nd:YAG, laser. Collection of data with LIGO data acquisition system and processing with MATLAB.

Student Researcher, Clark University, Worcester, MA 01601 **Summer 2009, 2010**

Researched 1D antiferromagnetic chains $Cu_{(1-x)}Zn_{(x)}(3,5\text{-diClpy})_2Cl_2$ and $Cu(Py)_2Cl_{2(1-x)}Br_{2(x)}$ under the guidance of Prof. Christopher Landee. Performed synthesis, simulation with the Algorithms and Libraries for Physics Simulations (ALPS), collected data using a SQUID Magnetometer and analyzed data using Origin 7.0.

Teaching Experience

Teaching Assistant, Cornell University, Ithaca, NY 14850

PHYS2214 - Physics III: Oscillations, Waves, and Quantum Physics	**Fall 2012**
PHYS2213 - Physics II: Electromagnetism	**Spring 2013**

Teaching Assistant, Clark University, Worcester, MA 01601

PHYS127 - Computer Simulations	**Spring 2011**
MATH217 - Probability and Statistics	**Fall 2010, 2011**
CS120 - Introduction to Computing	**Fall 2009, 2010**

Publications

2. ACTPol Collaboration (2014) *The Atacama Cosmology Telescope: Lensing of CMB Temperature and Polarization Derived from Cosmic Infrared Background Cross-Correlation*, submitted for review (December 2, 2014); arXiv:1412.0626.
1. ACTPol Collaboration (2014) *The Atacama Cosmology Telescope: CMB Polarization at* $200 < \ell < 9000$, Journal of Cosmology and Astroparticle Physics 10(2014)007, (October 1, 2014); doi:10.1088/1475-7516/2014/10/007, arXiv:1405.5524.

Conference Proceedings

3. Stacey, G.J., Parshley, S., Nikola, T., et. al. *SWCam: the short wavelength camera for the CCAT Observatory*, Proc. SPIE 9153, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy VII, 915310L (August 19, 2014); doi:10.1117/12.2057101
2. Grace, E., Beall, J., Bond, J.R., et. al. *ACTPol: on-sky performance and characterization*, Proc. SPIE 9153, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy VII, 915310 (July 23, 2014); doi:10.1117/12.2057243
1. Wheeler, J.D., Koopman, B., Gallardo, P., et. al. *Antireflection coatings for submillimeter silicon lenses*, Proc. SPIE 9153, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy VII, 91532Z (July 23, 2014); doi:10.1117/12.2057011

Contributed Talks

5. *Atacama Cosmology Telescope: Polarization calibration analysis for CMB measurements with ACTPol and Advanced ACTPol*, APS April Meeting 2015, April 2015
4. *Deep reactive ion etching of silicon anti-reflection coatings for sub-millimeter optics*, SPIE Astronomical Telescopes and Instrumentation 2014, June 2014 (poster)
3. *ACTPol: Status and preliminary CMB polarization results from the Atacama Cosmology Telescope*, APS April Meeting 2014, April 2014
2. *Development of Optics and Detectors for Advanced CMB Polarization Measurements*, Cornell Graduate Student Seminar, November 2013
1. *Scanning Tunneling Microsocpy of Fe Doped* $Bi_2Sr_2CaCu_2O_{8+x}$, APS March Meeting 2012, February 2012

Outreach and Service

Cornell Physics Graduate Society (PGS) Communications Officer	**2013 – 2014**
Organized PGS Outreach at Dragon Boat Festival	**Summer 2013**
Organized PGS Outreach at Ithaca Festival	**Summer 2013**
Expanding Your Horizons Conference Volunteer	**2013**