

ABIGAIL T. CRITES

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RESEARCH INTERESTS

Experimental Physics and Observational Cosmology, Cosmic Microwave Background (CMB), Epoch of Reionization (EOR), New Instrumentation and Techniques for Bolometric Detectors, Cryogenics

EDUCATION

University of Chicago, Astronomy and Astrophysics, Ph.D.	2013
University of Chicago, Astronomy and Astrophysics, M.S.	2010
California Institute of Technology, Physics, B.S.	2006

APPOINTMENTS

▪ Keck Institute for Space Studies Postdoctoral Fellow - Caltech	October 2013 — Present
▪ Graduate Student Research Assistant - University of Chicago Dr. John Carlstrom	June 2007 — September 2013
▪ Graduate Student Teaching Assistant - University of Chicago PhySci 119 and PhySci 120	October 2006 — June 2007
▪ Undergraduate Research Assistant - California Institute of Technology Dr. Andrew Lange	2002 — 2006

AWARDS

McCormick Graduate Student Fellowship , University of Chicago	2006
Upper Class Merit Award , California Institute of Technology	2004

CONFERENCES, TALKS AND PRESENTATIONS

▪ Invited Talk: CASS Colloquium UCSD , La Jolla, CA	October 2015
▪ Talk: Low Temperature Detectors – 16, Grenoble, France	July 2015
▪ Talk: JPL Astrophysics Lunch , Pasadena, CA	June 2015
▪ Talk: American Physical Society , Baltimore, MD	April 2015
▪ Talk: SPIE , Montreal, QC	June 2014
▪ Talk: Texas Symposium on Relativistic Astrophysics , Dallas, TX	December 2013
▪ Department Colloquium: University of Toronto, Dunlap Institute , Toronto, ON	January 2013
▪ Dissertation Talk: American Astronomical Society , Long Beach, CA.	January 2013
▪ Department Colloquium: Cornell University, CLASS , Ithaca, NY	January 2013
▪ Invited Talk: NIST Quantum Devices Group , Boulder, CO	January 2013
▪ Talk: Great Lake Planetarium Association , Pittsburg, PA.	October 2012
▪ Talk: Applied Superconductivity Conference , Washington, D.C.	August 2010

- Poster: **Low Temperature Detectors 13**, Palo Alto, CA.

July 2009

RESEARCH EXPERIENCE

Member of the TIME Collaboration

(2013 — present)

- Currently working on mechanical design for mating the TIME-Pilot receiver to the JCMT telescope (2015 – present)
- Currently working on mechanical and thermal design for the TIME-Pilot spectrometers, radiation shields, and support structure (2014 – present)
- Mentoring a high school student on design and assembly of a cold trap to optimize cryogenic performance (2014 – present)
- Mentored a high school student who designed a prototype spectrometer grating stack for testing (Summer 2014)
- Specified configuration for the TIME-Pilot multiplexing readout (2014)
- Designed version 1.0 of the superconducting kapton cable to readout the TES detectors (2014)
- Extensive testing and troubleshooting to improve cryogenic performance for the BLISS/TIME-Pilot cryostat (2013 – 2014)

Member of the South Pole Telescope Collaboration

(2007 — present)

- Led the analysis for the E-mode polarization power spectra from SPTpol data, *Measurements of E-Mode Polarization and Temperature-E-Mode Correlation in the Cosmic Microwave Background from 100 Square Degrees of SPTpol Data*. (A. Crites, J. W. Henning, et al. 2015)
- Analyzed SPTpol data from raw time ordered data to maps for CMB analysis. This included software development in python, data quality cuts, and calibration (2012 – 2014)
- Created maps for the first detection of B-modes from the CMB, *Detection of B-mode Polarization in the Cosmic Microwave Background with Data from the South Pole Telescope*. (D. Hanson, S. Hoover, A. Crites, et al. 2013)
- Deployed the SPTpol camera to the South Pole with the four person receiver team (Austral summer, 2011 – 2012)
- Integration of the SPTpol camera including detectors, readout electronics, and software from multiple institutions across the US and Canada (2011)
- Assembly and testing of the 90 GHz detectors for SPTpol (2011)
- Part of the receiver team of three people who upgraded the SPT-SZ camera (2009 – 2011)
- Mechanical and thermal design for the SPTpol focal plane (2009 – 2011)
- Tested TES bolometers in liquid helium and pulse tube cooled cryostat for the SPT-SZ and SPTpol cameras (2007 – 2011)

SELECTED EDUCATION AND OUTREACH

▪ Mentoring High School Students

June 2014 — present

Mentoring three talented high school students as they do research in the lab at Caltech.

▪ Lab Tour With All-Girls Science Summer Camp from Walden School

August 2014

Two hour presentation, tour, and activity with 4th-6th grade students about cosmology and electromagnetic radiation. Used IR thermal imaging camera to demonstrate how astronomers can learn from light our eyes cannot detect.

- **Women Mentoring Women at Caltech** November 2013 — present
In a program sponsored by the Caltech Center for Diversity, female postdoctoral scholars mentor upper level graduate student women as they prepare to take the next steps in their careers.
- **Classroom Visits** 2011 — present
Independent visits to classrooms in Chicago, San Antonio, and Pasadena with ages ranging from 1st grade to 1st year undergraduates to talk informally about the South Pole Telescope, Antarctica, astrophysics and careers in science.
- **Space Visualization Laboratory - Astronomy Conversations (25 events)** 2009 — 2013
One to two hour events once a month where scientists informally discuss current research with museum visitors at Adler Planetarium.
- **New York City Street Science Fair** June 2012
(1) Acted as a scientific consultant in the development of an exhibit featuring the South Pole Telescope (SPT) by SAIC art students. (2) Presented SPT science using the exhibit at World Science Festival.

DEPARTMENT AND INSTITUTION SERVICE AND LEADERSHIP

California Institute of Technology Department and Institute Service:

- Weekly Astronomy Tea Talk Co-Organizer** June 2014 — present
- Caltech Postdoctoral Association Career Committee Chair** September 2014 — present
Organized professional events for postdoctoral scholars at Caltech including a yearly workshop on mentoring students, workshops and panels on applying for academic jobs, and a workshop to improve productivity through meditation. All activities required coordinating with other postdocs, outside speakers, and faculty and staff on campus.

Caltech Postdoctoral Association Career Committee Member October 2013 — present
University of Chicago Astronomy and Astrophysics Department Committee Membership:

- Women in Science** 2012 — 2013
- Brinson** 2011 — 2012
- Broader Horizons** 2010 — 2011

REFERENCES

Professor Jamie Bock, California Institute of Technology, jjb@astro.caltech.edu
Professor John Carlstrom (Graduate Advisor), University of Chicago, jc@kickp.uchicago.edu
Professor Steve Meyer, University of Chicago, meyer@uchicago.edu
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