

SETH R. SIEGEL

Division of Physics, Mathematics, and Astronomy
California Institute of Technology
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Education

California Institute of Technology 2009 – Present
Ph.D. Candidate in Physics (defending July 2015)

University of Michigan - Ann Arbor 2005 – 2009
B.S. with Highest Distinctions and Highest Honors in Physics
2nd Major: Mathematics GPA: 3.94/4.00

Technical Skills

Programming C | MATLAB | IDL | SQL | Bash | LaTeX | HTML

Laboratory Cryogenics | Machining | Microwave/RF Engineering | Automation

Fellowships

NASA Earth and Space Science Fellowship in Astrophysics 2011 – Present

Moore Experimental Astrophysics Fellowship 2009 – 2011

Research Experience

Graduate Research Assistant 2009 – Present
California Institute of Technology

Advisor: Sunil Golwala

Thesis: Characterization of a New Instrument for (Sub)mm Astronomy
and a Multi-Wavelength Study of the Intra-Cluster Medium

- Tested, commissioned, and observed with MUSIC, a new camera for the 10-meter telescope at the Caltech Submillimeter Observatory (Mauna Kea, Hawaii).
 - Led effort to characterize optical efficiency, spectral response, on-sky loading, and noise properties of over 1000 Microwave Kinetic Inductance Detectors (MKIDs). Designed and implemented SQL database to organize results.
 - Developed MCMC algorithm in MATLAB to fit underlying physical model to calibration data to extract reliable predictions for detector performance.
 - Created algorithm in IDL to remove correlated electronics and atmospheric noise from time ordered data, improving long-timescale stability of the instrument.
 - Lead role in commissioning the camera, developing and debugging data reduction pipeline, and interpreting on-sky data.

- Combined optical, X-ray, and mm-wave observations to constrain more realistic models for the distribution of matter in 20 massive galaxy clusters.
 - Authored C code to interface mm-wave data with an existing framework for modeling/fitting multi-wavelength observations.

Undergraduate Research Assistant
University of Michigan - Ann Arbor

2007 – 2009

Advisor: Timothy McKay

Thesis: Cross-Correlation Between Halo Mass and the Sunyaev-Zel'dovich Effect
in the Millennium Gas Simulation

- Developed technique for combining future large scale astronomical surveys at mm and optical wavelengths to measure the average pressure distribution of low-mass galaxy clusters. Tested with numerical simulations.

Awards

Wirt & Mary Cornwell Prize for Undergraduates	2009
Awarded to one graduating Physics major who has shown promise for original study and creative work.	
Phi Beta Kappa	2008
Phi Kappa Phi	2008

