Anthony R Pullen

Curriculum Vitae and Publication List

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BIOGRAPHICAL INFORMATION

Date of birth: April 8, 1983
Citizenship: United States of America

RESEARCH INTERESTS

Cosmic microwave background (CMB) radiation, large-scale structure (LSS), galaxy surveys, astrophysical constraints to dark matter and dark energy, non-Gaussian perturbations, statistical anisotropy, alternatives to inflation, analysis of cosmological data from the current experiments and capabilities of future CMB and LSS probes

EDUCATION

- *Sept. 2004-present:* **CALIFORNIA INSTITUTE OF TECHNOLOGY**, Ph. D. Candidate in Physics; GPA 4.0; degree expected in June 2011.
  Thesis: Exploration of Alternative Solutions to Today's Cosmology Problems
  Advisor: Prof. Marc Kamionkowski

- *June 2001-May 2004:* **SOUTHERN UNIVERSITY AND A&M COLLEGE**, B. S. Physics, *summa cum laude*
  GPA: 4.0

PUBLICATIONS

- *Non-detection of a statistically anisotropic power spectrum in large-scale structure*, JCAP 1005: 27 (2010)
- *Cosmic Microwave Background Statistics for a Direction-Dependent Primordial Power Spectrum*, Phys. Rev. D 76: 103529 (2007)
- *Search with EGRET for a Gamma Ray Line from the Galactic Center*, Phys. Rev. D 76: 063006 (2007)

WORK IN PROGRESS

- *Search for local primordial non-Gaussianity from large-scale structure*, in collaboration with Prof. Christopher M. Hirata, California Institute of Technology

RESEARCH EXPERIENCE

- *Aug. 2004-present:* **GRADUATE STUDENT, CALIFORNIA INSTITUTE OF TECHNOLOGY** – Constrained properties of low-mass dark matter and statistical anisotropy. Dark matter constraints were determined using gamma-ray emission data from the Energetic Gamma-Ray Experiment Telescope. Statistical anisotropy and non-Gaussianity were constrained using data from the luminous red galaxy and quasar samples, respectively, from the SDSS. Determined quantity of violation of statistical isotropy of the universe detectable by CMB experiments. Collaborators: Prof. Marc Kamionkowski, Prof. Christopher Hirata, Dr. Ranga-Ram Chary
- *Summer 2003:* **MINORITY UNDERGRADUATE RESEARCH FELLOW (MURF)**, NASA JET PROPULSION LAB (JPL), ASTROPHYSICS GROUP – Designed lenses for the QUIET polarimeter array to detect B-mode polarization in the CMB possibly produced by gravitational waves in the early universe. Aided in design of Magic Tee waveguide to test electrical components of the QUIET array.

TEACHING EXPERIENCE

- **TEACHING ASSISTANT, CALIFORNIA INSTITUTE OF TECHNOLOGY**:
  Ph 1abc – *Classical Mechanics and Electromagnetism*, 2009-10. Profs. Jonas Zmuidzinas and David Politzer.
  Instructed the freshman general physics course. Conducted recitation sessions for solving classical mechanics problems to students in Fall 2009. Lectured concepts as an instructor in electromagnetism and special relativity to non-majors in Winter and Spring 2010. Monitored continuously the progress of students. Offered help after class. Assisted in constructing and grading final exams.
- **TEACHING ASSISTANT, CALIFORNIA INSTITUTE OF TECHNOLOGY**:
  Ph 2ab – *Waves, Quantum Mechanics, and Statistical Physics*, Fall 2008 and Winter 2009. Profs. Chris Martin, Marc Kamionkowski, and Brad Fillipone.
  Instructed recitations for the sophomore general physics course for non-majors. Performed two lectures in thermal physics for 150 students. Demonstrated solving problems in quantum physics, thermal physics, and wave phenomena to students. Monitored continuously the progress of students. Offered help after class. Assisted in grading quizzes and homework and in leading quiz reviews. Received emails from students praising my methods.
- **INSTRUCTOR, TIMBUKTU ACADEMY, SOUTHERN UNIVERSITY**
  Taught calculus-based introductory physics to high school students, Summer 2004

SEMINAR/CONFERENCE PRESENTATIONS

- *Search for anisotropic power in large-scale structure*
  - ITC Seminar, Harvard University, Cambridge, MA, Dec 2010
  - Cosmology Seminar, UC Berkeley, Berkeley, CA, Oct. 2010
  - KICP Cosmology Seminar, Stanford University, Stanford, CA, Oct. 2010
  - Astrophysics Seminar, NASA JPL, La Canada-Flintridge, CA, Sept. 2010
- *CMB statistics for a direction-dependent primordial power spectrum*, 7th Annual TASC Meeting, UCLA, Los Angeles, CA, Nov. 2007
- *Search with EGRET for a gamma-ray line from the galactic center*, UCLA Dark Matter '06 Conference, Marina Del Ray, CA, Feb. 2006

COMPUTER SKILLS

- Proficient in Fortran 77/90, C, IDL, Perl, Super-Mongo, Mathematica, and HTML, as well as PC, Macintosh and Linux Platforms.

LEADERSHIP EXPERIENCE

- **CITYFEST DIRECTOR**. Organized a youth outreach in the Los Angeles area. Gave away school supplies to over 500 kids, Aug 2010
- **SOCIETY OF PHYSICS STUDENTS CHAPTER PRESIDENT**, Southern University. Revived chapter membership and established an alliance with Louisiana State University Chapter, Aug 2003-Spring 2004

HONORS AND AWARDS

- National Science Foundation Graduate Research Fellow (2005-2008)
- Student Researcher of the Year: Natural Sciences, Southern University (2004)

REFERENCES

- Prof. Marc Kamionkowski, Prof. Christopher M. Hirata, Theoretical Astrophysics Including Relativity (TAPIR) research group, Mail Code 350-17, California Institute of Technology, Pasadena, CA, 91125.
- Dr. Ranga-Ram Chary, U.S. Planck Data Center Lead, Research Scientist/Member of Professional Staff, MS 220-6, California Institute of Technology, Pasadena, CA 91125