

## Jennifer Anne Burney

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### Education

Ph.D., Physics, Stanford University (January 2007)  
Areas of Focus: Detector Physics, Astrophysics Instrumentation and Observation

A.B., History and Science, Harvard College (June 1999)  
Areas of Focus: Physics and Modern American History

### Research Experience

Postdoctoral Researcher, Program on Food Security and the Environment (January 2008 - Present)

Linkages between energy poverty and food and nutrition security at different scales. Creation, implementation, and evaluation of technology-based interventions for food security, energy access, and human development (e.g. solar-powered drip irrigation systems); use of randomization and mixed methodologies to evaluate impacts across a broad array of indicators. Energy use in agriculture, fertilizer production.

Graduate Student Researcher, Stanford University Physics Department (Spring 2001 - Fall 2006)

Thesis: "Transition-Edge Sensor Imaging Arrays for Astrophysics Applications." Senior graduate student on a project to build a novel superconducting camera system for near-infrared/optical/near-ultraviolet astrophysics, enabling simultaneous time-stamping and energy-resolution of individual photons, making it useful for both very faint sources (e.g., extra-solar planets), and rapidly varying sources (e.g., pulsars, black hole systems).  
Advisor: Blas Cabrera

### Teaching Experience

Course Coordinator, Civil and Environmental Engineering Department (March 2004 - March 2006)

Co-founded and helped teach CEE 177S/277S (Design for a Sustainable World) at Stanford, a course in which students work with with local and international partners to supply design ideas and expertise for a broad array of development projects.

Teaching Assistant, Physics Department, Stanford CA (2000 - 2003)

TA for Honors Introductory Mechanics, Advanced Classical Mechanics (Head TA), Quantum Mechanics (3 quarters, Head TA), Introductory Observational Astronomy, and Astronomy for Non-Scientists (Head TA).  
Extensive departmental tutoring in Modern Physics, Quantum Mechanics, and Statistical Mechanics. Co-created Physics Department TA training workshop and manual.

### Development Experience

Project Coordinator, Solar Electric Light Fund, Kalalé, Benin (February - December 2007)

Coordinated all aspects of a pilot project in Northern Benin to install three "Solar Market Gardens," or solar-powered drip irrigation systems, enabling farmers to grow nutritious and high-value produce year-round. Continue to coordinate analysis and monitoring at Stanford. Also continue to oversee project activities and write reports and grants on a consulting basis.

Director of Research, Engineers for a Sustainable World -- Stanford, Stanford CA (March 2003 - March 2005)

Inaugural Director of Research for ESW-Stanford. Fundraised for project materials and travel expenses, managed course and chapter finances, served as liaison for project partners and local experts, and helped choose and coordinate chapter projects. Co-chair of 2004 ESW Annual Conference: "Solutions for a Shrinking Planet: Sustainable Engineering and Enterprise for Human Development" at Stanford.

### **Fellowships, Grants, Awards**

2007: Woods Institute for the Environment Environmental Ventures Program grant recipient

2006: Joseph R. McMicking Fellow, Stanford Physics Department

2003 - 2006: NASA Graduate Student Research Program Fellowship

1999: Hoopes Prize for "Outstanding Senior Thesis" (Harvard College)

1999: Rothschild Prize for "Best Written Thesis" (Harvard History of Science Department)

1999: Phi Beta Kappa (Harvard College)

1998: Ernest Coleman Award for Scholarship and Citizenship (Stanford Linear Accelerator Center)

### **Publications**

- J. Burney, T.J. Bay, J. Barral, P.L. Brink, B. Cabrera, J.P. Castle, A.J. Miller, S.W. Nam, D. Rosenberg, R.W. Romani, A. Tomada. "Transition-edge sensor arrays for UV-optical-IR astrophysics," *Nuclear Instruments and Methods in Physics Research Section A*, Volume 559, p. 525-527 (2006).
- J. Burney, T.J. Bay, P. Brink, B. Cabrera, P. Castle, R. Romani, A. Tomada, S. Nam, A. Miller, J. Martinis, E. Wang, T. Kenny, B. Young. "Development and Characterization of a TES Optical Imaging Array for Astrophysics Applications," *Nuclear Instruments and Methods in Physics Research Section A*, Volume 520, p. 533-536 (2004).
- T.J. Bay, J. Burney, J. Barral, P.L. Brink, B. Cabrera, J.P. Castle, A.J. Miller, S.W. Nam, R.W. Romani, A. Tomada. "The optical imaging TES detector array: Considerations for a cryogenic imaging instrument," *Nuclear Instruments and Methods in Physics Research Section A*, Volume 559, p. 506-508 (2006).
- Bay, T.J., J. Burney, P.L. Brink, B. Cabrera, J.P. Castle, R.W. Romani, A. Tomada, B.A. Young, S. Nam, A.J. Miller, J. Martinis, T.W. Kenny, E. Wang, "Development of superconducting transition edge sensors for time- and energy-resolved single-photon counters with application to imaging astronomy," *Materials for Infrared Detectors III*. Edited by Longshore, Randolph E.; Sivananthan, Sivalingam. *Proceedings of the SPIE*, Volume 5209, pp. 192-200 (2003).

### **Invited Talks**

San Jose State Engineering 100W Lecture, San Jose, CA (Fall 2008)

Santa Clara University Physics Department Colloquium, Santa Clara CA (Fall 2004)

## **Other Skills**

Near-fluent Spanish and French, conversational Hebrew.

Construction, carpentry, and machining experience.

Programming: C/C++, Python, Matlab, R, Stata

Played soccer through college (top-8 team, All-Ivy + Academic All-Ivy honors).

Member of an elite women's ultimate frisbee team.

Violin, guitar, and occasional mandolin player.

## **References**

(The following three individuals have agreed to submit letters of recommendation on my behalf; additional references available upon request.)

Rosamond (Roz) Naylor, postdoctoral adviser

William Wrigley Senior Fellow in Environmental Science and Policy,

Woods Institute for the Environment, Stanford University

Director, Program on Food Security and the Environment

Associate professor of Economics, by courtesy

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Blas Cabrera, dissertation adviser

Professor, Stanford Physics Department

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Robert Freling, former employer

Executive Director, Solar Electric Light Fund

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