
Dr. Joseph A. Barranco

Department of Physics & Astronomy
San Francisco State University
1600 Holloway Avenue
San Francisco, CA 94132-4163

barranco@sfsu.edu
Phone: (415) 338-2450
Fax: (415) 338-2178
<https://faculty.sfsu.edu/~barranco>

Education

University of California, Berkeley

- Ph.D. May 2004, Astrophysics; M.A. December 1996, Astronomy
- Thesis: *Theory and Numerical Simulation of Three-Dimensional Vortices in Protoplanetary Disks*
- Advisor: Professor Philip S. Marcus

Harvard University, Cambridge, MA

- A.B. 1993, Physics, Astronomy & Astrophysics, *Magna Cum Laude*
- Thesis: *Velocity Coherent Structure in the Dense Cores of Dark Molecular Clouds*
- Advisor: Professor Alyssa A. Goodman

Milford High School, Milford, MA

- June 1989, Valedictorian, National Honor Society, President of Theatre Workshop, Eagle Scout

Academic & Research Appointments

San Francisco State University, San Francisco, CA

- Interim Chair, Dept. of Physics & Astronomy, August 2018 – present
- Associate Professor, Dept. of Physics & Astronomy, August 2013 – present
- Assistant Professor, Dept. of Physics & Astronomy, August 2007 – July 2013

Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

- Postdoctoral Fellow, Institute for Theory & Computation, August 2005 – July 2007

University of California, Santa Barbara

- Postdoctoral Fellow, Kavli Institute for Theoretical Physics, January 2004 – July 2005

Department of Astronomy, University of California, Berkeley

- Graduate Student Researcher, Advisor: Professor Philip S. Marcus, September 1996 – December 2003

Department of Astronomy, Harvard University, Cambridge, MA

- Undergraduate Research Assistant, Advisor: Professor Alyssa A. Goodman, January 1993 – June 1995
- Undergraduate Research Assistant, Advisor: Professor Jonathan E. Grindlay, June 1991 – December 1992

Honors & Awards

- NASA Group Achievement Award, SIM Planet Finding Capability Study Team (Team leader: Dr. Debra Fischer), May 2010: “For successful completion of the study of the detection capability of an astronomical mission searching for terrestrial planets in habitable zones of nearby stars.”
- San Francisco State University Presidential Award for Faculty Scholarship, Spring 2010
- American Physical Society Nicholas Metropolis Award
for Outstanding Doctoral Thesis Work in Computational Physics, 2006
- U.C. Berkeley Outstanding Graduate Student Instructor Award, 1998
- John Harvard Scholarship, 1991, 1993, Harvard College Scholarship, 1992

Research Grants & Fellowships

Monetary Grants

- NSF EAGER (Early-Concept Grants for Exploratory Research), **\$38,349**, 2015-2017
- NSF Astronomy & Astrophysics Research Grants, **\$425,881**, 2010-2015
- NSF Astronomy & Astrophysics Postdoctoral Fellowship, **\$194,000**, 2004-2007
- U.C. Berkeley Center for Integrative Planetary Studies Mini-Grant, **\$17,500**, 2001-2002
- NSF Graduate Student Fellowship, **\$60,000**, 1996-1999

Grants of Computer Resources

XSEDE = Extreme Science & Engineering Design Environment, XRAC = XSEDE Resource Allocations Committee, TACC = Texas Advanced Computing Center, SDSC = San Diego Supercomputing Center

According to NSF/XSEDE: “The allocation of high-end computational resources, visualization, and storage by the XRAC is done via a *competitive* process, designed in a similar fashion to the NSF *peer-review* system.”

Note: The “estimated value” of resources is not money directly awarded to PI/Co-PI or their institutions, but is an approximate valuation of the worth of resources.

- XSEDE, “The Zombie Vortex Instability in Protoplanetary Disks and Vortex Dynamics & Zonal Flows in Planetary Atmospheres,” PI: Philip Marcus (U.C. Berkeley), CoPI: Joseph Barranco (SFSU), 2,500,000 compute hours on SDSC Comet Supercomputer, 04/2018 – 03/2019, estimated value of resources \$83,375
- XSEDE “The Zombie Vortex Instability in Protoplanetary Disks and the Role it Plays in Star and Planet Formation,” PI: Philip Marcus (U.C. Berkeley), CoPI: Joseph Barranco (SFSU), 2,842,690 compute hours on SDSC Comet Supercomputer, 10/2016 – 03/2018, estimated value of resources \$94,382
- XSEDE “The Zombie Vortex Instability and Its Role in Star, Planet, and Meteorite Formation,” PI: Philip Marcus (U.C. Berkeley), CoPI: Joseph Barranco (SFSU), 1,173,958 compute hours on SDSC Comet Supercomputer & 2,344,894 compute hours on TACC Stampede Supercomputer, 07/2015 – 09/2016, estimated value of resources \$141,202
- XSEDE “Vortices, Inertio-Gravity Waves, Critical Layers, and Acoustic Waves in Protoplanetary Disks and their Roles in Star and Planet Formation,” PI: Philip Marcus (U.C. Berkeley), CoPI: Joseph Barranco (SFSU), 1,301,087 compute hours on TACC Stampede Supercomputer, 04/2014 – 06/2015, estimated value of resources \$46,819

Professional Leadership

- Active membership in the American Physical Society (Divisions of Astrophysics, Fluid Dynamics, Computational Physics) and the American Astronomical Society (Division of Planetary Sciences).
- **Co-Director of SF-STAR (Supercomputing Facility for Space & Terrestrial Advanced Research)**, 01/2010 – present. Co-director Assoc. Prof. Andisheh Mahdavi. This facility consists of a PowerWulf Supercomputing Cluster with 88 processing cores for research in physics & astronomy. B.S. and M.S. students at SFSU have the opportunity to learn parallel computing as part of these research projects.
- **Cal-Bridge**, 08/2016 – present. Steering committee and chair of recruitment committee. The mission of the Cal-Bridge program is to increase the number of California State University (CSU) students (especially women, African-Americans, Hispanic, and Native Americans, and first-generation students) completing their bachelor’s degree and successfully entering a PhD program to study physics, astronomy, or a closely related field. Program consists of scholarships, mentorship from both CSU and UC faculty, summer research opportunities, and professional development workshops throughout the academic year. See: <http://www.cpp.edu/~sci/physics-astronomy/research/cal-bridge.shtml>
- **American Astronomical Society Committee on the Status of Minorities in Astronomy (CSMA)**, 07/2012 – 06/2015. This committee works to increase the number of historically under-represented minorities, notably African-Americans, Hispanic, and Native Americans, who earn degrees in astronomy and pursue successful careers in astronomy in the United States. I helped write a NSF proposal to fund underrepresented minority (URM) students to attend national conferences. See: <http://csma.aas.org/>.
- **American Physical Society Committee on Minorities (COM)**, 01/2012 – 12/2014. This committee works to increase the number of historically under-represented minorities, notably African-Americans, Hispanic, and Native Americans, who earn degrees in physics and pursue successful careers in physics in the United States. COM conducts site visits and offers a minority scholarship for undergraduate physics majors. Other programs include the annual Edward A. Bouchet Award, travel grants, and the Roster, which lists names and qualifications of several hundred women and minorities in physics to facilitate them being invited as speakers. See: <http://www.aps.org/about/governance/committees/commin/index.cfm>.
- Creator and moderator of Facebook page for LGBT (Lesbian, Gay, Bisexual, Transgendered) Physicists, Astrophysicists, Astronomers and Friends. See: <http://www.facebook.com/groups/89586472053>.
- Peer-reviewer for scientific articles and grant proposals for The Astrophysical Journal, Cambridge University Press, Journal of Computational & Applied Mathematics, Monthly Notices of the Royal Astronomical Society, NASA, National Science Foundation, Physics of Plasma, Theoretical & Computational Fluid Dynamics

Teaching Experience at SFSU, August 2007–May 2018

Semester	Course	Title	Enrollment ¹	Teaching effectiveness ²	Department average
Spring 2018	Physics 440 ³	Computational Physics	4 (2)	1.00	1.99
	Physics 770 ³	Computational Physics	19 (16)	1.31	
Fall 2017	Physics 330	Analytic Mechanics I	19 (17)	1.12	2.04
	Astronomy 400 ³	Stellar Astrophysics	4 (4)	1.00	
	Astronomy 700 ³	Stellar Astrophysics	4 (3)	1.33	
Spring 2017	Physics 220	General Physics w/ Calculus I	72 (50)	2.36	2.00
	Physics 220	General Physics w/ Calculus I	72 (53)	2.21	
Fall 2016	Physics 330	Analytic Mechanics I	33 (25)	1.24	2.02
Spring 2016	Physics 220	General Physics w/ Calculus I	165 (120)	2.00	1.91
	Physics 440 ³	Computational Physics	14 (11)	1.36	
	Physics 770 ³	Computational Physics	13 (10)	1.10	
Fall 2015	Physics 220	General Physics w/ Calculus I	167 (130)	2.42	1.98
	Physics 330	Analytic Mechanics I	33 (24)	1.29	
Spring 2015		<i>Sabbatical</i>			
Fall 2014	Physics 220	General Physics w/ Calculus I	162 (121)	2.06	2.04
	Physics 330	Analytic Mechanics I	34 (27)	1.59	
Spring 2014	Physics 220	General Physics w/ Calculus I	127 (99)	2.00	2.10
	Physics 440 ³	Computational Physics	9 (5)	1.20	
	Physics 770 ³	Computational Physics	12 (6)	2.33	
Fall 2013	Physics 330	Analytic Mechanics I	28 (19)	1.53	1.99
Spring 2013	Astronomy 400 ³	Stellar Astrophysics	5 (2)	1.00	NR
	Astronomy 700 ³	Stellar Astrophysics	5 (5)	1.00	
	Physics 712	Physics of Plasmas	8 (8)	1.75	
Fall 2012	Physics 330	Analytic Mechanics I	29 (24)	1.50	NR
	Physics 440 ³	Computational Physics	7 (6)	1.50	
	Physics 770 ³	Computational Physics	13 (10)	1.70	
Spring 2012	Physics 220	General Physics w/ Calculus I	98 (89)	1.62	NR
	Astronomy 400 ³	Stellar Astrophysics	5 (4)	1.00	
	Astronomy 700 ³	Stellar Astrophysics	1 (1)	1.00	
Fall 2011	Physics 220	General Physics w/ Calculus I	140 (121)	1.88	NR
	Physics 330	Analytic Mechanics I	29 (25)	1.28	
Spring 2011	Astronomy 400 ³	Stellar Astrophysics	7 (7)	1.43	NR
	Astronomy 700 ³	Stellar Astrophysics	7 (6)	1.50	
	Physics 712	Physics of Plasmas	9 (7)	1.43	
Fall 2010	Physics 220	General Physics w/ Calculus I	114 (90)	1.56	NR
	Physics 330	Analytic Mechanics I	20 (17)	2.12	
Spring 2010		<i>Presidential Award Sabbatical</i>			
Fall 2009	Physics 220	General Physics w/ Calculus I	111 (91)	1.60	NR
	Physics 330	Analytic Mechanics I	20 (18)	1.67	
Spring 2009	Physics 220	General Physics w/ Calculus I	87 (73)	1.27	NR
	Physics 712	Physics of Plasmas	9 (7)	1.14	
Fall 2008	Physics 220	General Physics w/ Calculus I	107 (78)	1.64	NR
	Physics 330	Analytic Mechanics I	23 (19)	1.53	
Spring 2008	Physics 722	Astrophysics	9 (8)	2.25	NR
Fall 2007	Physics 220	General Physics w/ Calculus I	68 (50)	1.50	NR

¹ Enrollment figures are for census date. The number of student evaluations is in parentheses.

² Teaching effectiveness is based on Item 6 of the Student Evaluation of Teaching Effectiveness survey: “Please rate the overall effectiveness of your instructor on a scale ranging from the most positive response (highly effective) to the least positive response (ineffective). When I consider the contribution to my learning, this instructor’s teaching was:”. Mean scores are reported on a scale from 1 (“highly effective”) to 5 (“ineffective”).

³ Paired course. Joint lectures with differentiated assignments; graduate assignments are longer and more complex.

Thesis & Oral Exam Committees, August 2007 – September 2018

Student	Type of Committee	Date
Matt Giguere	M.S. Physics Thesis Defense	05/07/2009
Alison Mansheim	M.S. Physics Thesis Defense	07/02/2009
Michael Wong	M.S. Physics Oral Exam	06/18/2010
Franco DeMarinis	M.S. Physics Oral Exam	07/08/2010
Michael Ryan	M.S. Physics Thesis Defense	07/22/2010
Dima Kamalov	M.S. Physics Oral Exam	04/25/2011
Rajasi Joshi	M.S. Physics Thesis Defense	04/29/2011
Shannon Lee	M.S. Physics Thesis Defense	05/11/2011
Andrew Fittingoff	M.S. Physics Thesis Defense	07/28/2011
Samy Kamal	M.S. Physics Thesis Defense	08/02/2011
Gregory Romine	M.S. Physics Thesis Defense	12/13/2012
Ali Shayegan	M.S. Physics Thesis Defense	05/21/2013
Scott Shermer	M.S. Physics Thesis Defense	06/12/2013
Casey Moore	M.S. Physics Thesis Defense	07/17/2013
Reza Hashemzadeh	M.S. Physics Thesis Defense	09/19/2013
Binod Dhakal	M.S. Physics Oral Exam	12/11/2013
Silu Huang	M.S. Physics Oral Exam	12/12/2013
Robert Sandler	M.S. Physics/Astronomy Thesis Defense	12/18/2013
Colleen Twitty	M.S. Physics Thesis Defense	04/10/2014
Sean Alexander	M.S. Physics Oral Exam	04/24/2014
Diana Madera	M.S. Physics Thesis Defense	05/01/2014
Arthur Adams	M.S. Physics Thesis Defense	05/13/2014
Ezekiel Hadley	M.S. Physics Oral Exam	05/14/2014
Adam Fries	M.S. Physics/Astronomy Thesis Defense	11/20/2014
Eileen Gonzales	M.S. Physics/Astronomy Thesis Defense	12/16/2014
Carlos Hernandez	M.S. Physics Thesis Defense	12/18/2014
Larry Alden	M.S. Geosciences Thesis Defense	05/14/2015
M. Quinn Parkinson	M.S. Physics Thesis Defense	05/15/2015
Gaurev Rele	M.S. Physics Thesis Defense	08/13/2015
Alexander Pan	M.S. Physics Thesis Defense	08/17/2015
Charles Showley	M.S. Physics/Astronomy Thesis Defense	08/20/2015
Manav Singh	M.S. Physics Thesis Defense	12/10/2015
Devin Liner	M.S. Physics Oral Exam	05/10/2016
Allan Gamboa	M.S. Physics/Astronomy Oral Exam	09/07/2016
Jason Burmark	M.S. Computer Science Thesis Defense	05/25/2016
Justin Wittrock	M.S. Physics/Astronomy Thesis Defense	12/16/2016
Richard Vo	M.S. Physics Oral Exam	05/22/2017
Joshua Lamstein	M.S. Physics Thesis Defense	11/15/2017
Francisco Baltazar	M.S. Physics Thesis Defense	08/06/2018

Shaded names are students for whom Dr. Barranco advised on M.S. thesis projects. See below.

Student Advisees

Current M.S. Students

- Wendy Crumrine, M.S. Physics expected May 2019. Project: Numerical simulation of dust interaction with Zombie Vortex Instability
- Nicole Rider, M.S. Physics/Astro expected May 2019. Project: Numerical simulation of dust interaction with Zombie Vortex Instability
- Richard McWhirter, M.S. Physics/Astro expected December 2018. Project: Numerical simulation of 3D structure of zonal winds on Jupiter

Previous M.S. Students

- M. Quinn Parkinson, M.S. Physics/Astro, May 2015. Thesis: *Protoplanet-Planetesimal Interactions in Circumbinary Disks*.
- Diana Madera, M.S. Physics, May 2015. Thesis: *Dust Trapping in Protoplanetary Disk Vortices with a Two-Fluid Terminal Velocity Approach*. Now a Ph.D. candidate in Aeronautics & Astronautics at Stanford University
- Colleen Twitty, M.S. Physics, May 2015. Thesis: *Dust Trapping in Protoplanetary Disk Vortices with a Lagrangian Super-particle Approach*. Now a software engineer at Peloton Technology
- Andrew Fittingoff, M.S. Physics, August 2011. Thesis: *Light Curves of Kuiper Belt Objects and a Search for Kuiper Belt Binaries*. Now an Adjunct Instructor of Physics at the University of San Francisco
- Samy Kamal, M.S. Physics, August 2011. Thesis: *The Dynamics of Three-Dimensional Vortices in Rotating, Stratified Shear Flows*. Ph.D. in Aerospace Engineering from Arizona State University, May 2015. Now: Research Associate at Naval Postgraduate School in Monterey, CA
- Michael Ryan, M.S. Physics, August 2010. Thesis: *Faint Moons Orbiting Kuiper Belt Objects*. High school teacher at Sacred Heart Cathedral Preparatory School in San Francisco, CA

Current B.S. Students

- Michael Shadchin, B.S. Physics/Astro expected December 2018. Project: Numerical simulation of orbits of moons of Uranus with time dependent obliquity

Previous B.S. Students

- David Robinson, B.S. Physics/Astro, May 2015. Project: Numerical simulation of gravitational collapse of dust particles with REBOUND. Now Ph.D. candidate in Computational Science at Florida State University
- Connor Poland, B.S. Physics/Astro, May 2015. Project: Numerical simulation of gravitational collapse of dust particles with REBOUND. Now a M.S. candidate in Computational Science at U.C. San Diego
- Seth Gossage, B.S. Physics/Astro, May 2014. Project: Numerical simulation of protoplanet collisions with Uranus with GADGET2. Now a Ph.D. candidate in Astronomy at Harvard University
- M. Quinn Parkinson, B.S. Physics/Astro, May 2012. Project: Numerical simulation of dust settling in protoplanetary disks. Enrolled in M.S. program immediately after. M.S. Physics/Astro awarded May 2015
- Howard Nguyen, B.S. Physics/Astro, May 2013

Other Teaching Experience Prior to SFSU

Department of Astronomy, Harvard University

- Lab Instructor: Astronomy 191 (Astrophysics Laboratory), Spring 2006
- Taught undergraduates how to use 16-inch telescope and CCD to make observations of eclipsing binary stars, and to reduce & analyze data to determine orbital properties.

Department of Physics, University of California, Santa Barbara

- Lecturer: Physics 3 (Mechanical Waves, Electricity), Summer 2004

San Quentin Prison College Program

- Instructor: Statistics, Spring 2001; Astronomy, Summer 2001; Algebra, Fall 2001

Department of Physics, University of California, Berkeley

- Group Tutor: Physics 137a (Intro. Quantum Mechanics), Fall 2000
- Graduate Student Instructor: Physics 7A (Intro. Mechanics), Spring 2000 (Dr. B. Birkett)
- Graduate Student Instructor: Physics 7B (Intro. Electricity & Magnetism), Fall 1999 (Dr. B. Birkett)

Department of Astronomy, University of California, Berkeley

- Lecturer: Astronomy 7B (Intro. Astrophysics II), Spring 1998
- Head Graduate Student Instructor: Astronomy 7A (Intro. Astrophysics I), Fall 1997 (Prof. J. Graham)
- Head Graduate Student Instructor: Astronomy 10 (Intro. Astronomy), Spring 1996 (Prof. J. Silk)
- Graduate Student Instructor: Astronomy 10 (Intro. Astronomy), Fall 1995 (Prof. F. Shu)

Upward Bound Program at University of California, Berkeley

- Upward Bound is a mentoring/tutoring program for socio-economically disadvantaged high school students who are trying to become the first in their families to attend college.
- Math/Science Instructor: Math & Science Summer Academy, Summer 1996, 1997
- Math/Science Instructor: Saturday College, Fall 1996, Spring 1997

Division of Engineering and Applied Sciences, Harvard University

- Teaching Fellow for Applied Math 105a/b, Spring 1993, Fall 1993, Spring 1994, Spring 1995

Department of Mathematics, Harvard University

- Course Assistant for Calculus, Fall 1990, Spring 1991

Publications

Peer-Refereed Journal Articles Since October 2012

- **Barranco, J.A.**, Pei, S., Marcus, P.S., 2018, “Zombie Vortex Instability. III. Persistence with Nonuniform Stratification and Radiative Damping.” Submitted to The Astrophysical Journal.
- Marcus, P.S., Pei, S., Jiang, C.H., **Barranco, J.A.**, 2016, “Zombie Vortex Instability. II. Thresholds to Trigger Instability and the Properties of Zombie Turbulence in the Dead Zones of Protoplanetary Disks.” The Astrophysical Journal, **833**:148–161. arXiv:1605.07635.
- Marcus, P.S., Pei, S., Jiang, C.H., **Barranco, J.A.**, Hassanzadeh, P., Lecoanet, D., 2015, “Zombie Vortex Instability. I. A Purely Hydrodynamic Instability to Resurrect the Dead Zones of Protoplanetary Disks.” The Astrophysical Journal, **808**:87–102. arXiv:1410.8143.

Peer-Refereed Journal Articles August 2007 – September 2012

- Penev, K., **Barranco, J.A.**, Sasselov, D.D. 2011, “Three-dimensional Spectral Simulations of Anelastic Turbulent Convection.” The Astrophysical Journal, **734**:118. arXiv:0810.5151.
- Lee, A.T., Chiang, E., Asay-Davis, X., **Barranco, J.A.**, 2010, “Forming Planetesimals by Gravitational Instability: II. How Dust Settles to its Marginally Stable State.” The Astrophysical Journal, **725**: 1938–1954. arXiv:1010.0250.
- Lee, A.T., Chiang, E., Asay-Davis, X., **Barranco, J.A.**, 2010, “Forming Planetesimals by Gravitational Instability: I. The Role of the Richardson Number in Triggering the Kelvin-Helmholtz Instability.” The Astrophysical Journal, **718**: 1367–1377. arXiv:1010.0248.
- Penev, K., **Barranco, J.A.**, Sasselov, D.D. 2009, “Direct Calculation of the Turbulent Dissipation Efficiency in Anelastic Convection.” The Astrophysical Journal, **705**: 285–297. arXiv:0810.5370.
- **Barranco, J.A.** 2009, “Three-Dimensional Simulations of Kelvin-Helmholtz Instability in Settled Dust Layers in Protoplanetary Disks.” The Astrophysical Journal, **691**: 907–921. arXiv:0711.4410.
- Hartman, J. D., Gaudi, B. S., Holman, M. J., McLeod, B. A., Stanek, K. Z., **Barranco, J. A.**, Pinsonneault, M. H., Meibom, S., Kalirai, J. S., 2009, “Deep MMT Transit Survey of the Open Cluster M37. IV. Limit on the Fraction of Stars With Planets as Small as 0.3 R_J .” The Astrophysical Journal, **695**:336–356. arXiv:0809.3807.
- Hartman, J.D., Gaudi, B.S., Pinsonneault, M.H., Stanek, K.Z., Holman, M.J., McLeod, B.A., Meibom, S., **Barranco, J.A.**, Kalirai, J.S., 2009, “Deep MMT Transit Survey of the Open Cluster M37. III. Stellar Rotation at 550 Myr.” The Astrophysical Journal, **691**: 342–364. arXiv:0803.1488.
- Hartman, J.D., Gaudi, B.S., Holman, M.J., McLeod, B.A., Stanek, K.Z., **Barranco, J.A.**, Pinsonneault, M.H., Kalirai, J.S., 2008, “Deep MMT Transit Survey of the Open Cluster M37. II. Variable Stars.” The Astrophysical Journal, **675**: 1254–1277. arXiv:0709.3484.
- Hartman, J.D., Gaudi, B.S., Holman, M.J., McLeod, B.A., Stanek, K.Z., **Barranco, J.A.**, Pinsonneault, M.H., Meibom, S., Kalirai, J.S., 2008, “Deep MMT Transit Survey of the Open Cluster M37. I. Observations and Cluster Parameters.” The Astrophysical Journal, **675**: 1233–1254. arXiv:0709.3063.

Peer-Refereed Journal Articles Prior to August 2007

- **Barranco, J.A.** & Marcus, P.S. 2006 “A 3D Spectral Anelastic Hydrodynamic Code for Shearing, Stratified Flows,” Journal of Computational Physics, **219**:21–46. arXiv:astro-ph/0509063
- **Barranco, J.A.** & Marcus, P.S. 2005, “Three-Dimensional Vortices in Stratified Protoplanetary Disks,” The Astrophysical Journal, **623**:1157–1170. arXiv:astro-ph/0501267
- **Barranco, J.A.**, Marcus, P.S., & Umurhan, O.M. 2000, “Scalings and Asymptotics of Coherent Vortices in Protoplanetary Disks,” in *Studying Turbulence Using Numerical Simulation Databases – VIII, Proceedings of the 2000 Summer Program*, Stanford University/NASA–Ames Center for Turbulence Research, p.85–95.
- **Barranco, J.A.** & Marcus, P.S. 2000, “Vortices in Protoplanetary Disks and the Formation of Planetesimals,” in *Studying Turbulence Using Numerical Simulation Databases – VIII, Proceedings of the 2000 Summer Program*, Stanford University/NASA–Ames Center for Turbulence Research, p.97–108.
- **Barranco, J.A.** & Goodman, A.A. 1998, “Coherent Dense Cores. I. NH_3 Observations,” The Astrophysical Journal, **504**:207–222.
- Goodman, A.A., **Barranco, J.A.**, Wilner, D.J., & Heyer, M.H. 1998, “Coherence in Dense Cores. II. The Transition to Coherence,” The Astrophysical Journal, **504**:223–246.

Invited Talks & Colloquia

Since October 2012

- University of California, Santa Cruz, Department of Applied Mathematics & Statistics, June 6, 2018, “The Zombie Vortex Instability in Protoplanetary Disks and Its Role in Star and Planet Formation”
- U.C. Berkeley Center for Integrative Planetary Science, Workshop on “The Dusty Building-Blocks of Planet Formation: Bridging Theory and Observations in Our Solar System and Beyond,” April 11-12, 2018, Space Sciences Laboratory, “An Introduction to Protoplanetary Disks and Radiative Timescales”
- Reed College, Department of Physics, Portland, OR, September 25, 2013, “Planet Embryos in Vortex Wombs”

August 2007 – September 2012

- Sacramento State University, Department of Physics, February 2, 2012, “Planet Embryos in Vortex Wombs”
- Lehman College, City University of New York, Department of Physics, February 14, 2011, “Planet Embryos in Vortex Wombs”
- Anacapa Society Winter 2010 Workshop at the California Polytechnic University in Pomona, December 10–11, 2010, “Planet Embryos in Vortex Wombs”
- City College of San Francisco, April 22, 2009, “Planet Embryos in Vortex Wombs”
- City College of San Francisco, September 9, 2008, “Planet Embryos in Vortex Wombs”
- Peninsula Astronomical Society, May 9, 2008, “Planet Embryos in Vortex Wombs”
- University of San Francisco, Department of Physics, February 27, 2008, “Planet Embryos in Vortex Wombs”
- San Mateo County Astronomical Society, November 2, 2007, “Planet Embryos in Vortex Wombs”
- University of California, Santa Cruz, Department of Astronomy & Astrophysics, October 31, 2007, “Planet Embryos in Vortex Wombs”

Prior to August 2007

- California State Polytechnic University, Pomona, Department of Physics & Astronomy, February 27, 2007, “Planet Embryos in Vortex Wombs”
- San Francisco State University, Department of Physics & Astronomy, February 23, 2007, “Planet Embryos in Vortex Wombs”
- Nicholas Metropolis Award talk, American Physical Society, March 2006, Baltimore, MD, “A 3D Spectral Anelastic Hydrodynamic Code for Shearing, Stratified Flows”
- Haverford College, Department of Physics & Astronomy, February 6, 2006, “Planet Embryos in Vortex Wombs”
- Olin College of Engineering, Needham, MA, November 2005, “Planet Embryos in Vortex Wombs”
- Max Planck Institute for Astrophysics, Garching, Germany, December 2004, “Planet Embryos in Vortex Wombs”
- University of California, Berkeley, Department of Mechanical Engineering, Fluid Dynamics Seminar, April 2004, “Planet Embryos in Vortex Wombs”
- Kavli Institute for Theoretical Physics, University of California, Santa Barbara, February 2004, “Planet Embryos in Vortex Wombs”
- University of Texas, Austin, Department of Astronomy, October 2003, “The Future of Planet Formation”
- Lawrence Livermore National Laboratory, January 2003, “Planet Embryos in Vortex Wombs”
- Canadian Institute for Theoretical Astrophysics, Toronto, ON, January 2003, “Vortices in Protoplanetary Disks and the Formation of Planetesimals”
- Kavli Institute for Theoretical Physics, University of California, Santa Barbara, December 2002, “Vortices in Protoplanetary Disks and the Formation of Planetesimals”
- San Francisco State University, Department of Physics & Astronomy, December 2000, “Vortices in Protoplanetary Disks and the Formation of Planetesimals”

Conference Presentations

Since October 2012

- American Physical Society, Division of Fluid Dynamics, November 2016, Portland, OR. Marcus, P., **Barranco, J.**, Pei, S., Jiang, C.-H. “Zombie Turbulence and More in Stratified Couette Flow.”
- American Physical Society, Division of Fluid Dynamics, November 2015, Boston, MA. **Barranco, J.**, Pei, S., Marcus, P., Jiang, C.-H. “Zombie Vortex Instability: Effects of Non-uniform Stratification & Thermal Cooling.”
- American Physical Society, Division of Fluid Dynamics, November 2014, San Francisco, CA. Jiang, C.-H., Marcus, P., Pei, S., **Barranco, J.**, Hassanzadeh, P., Lecoanet, D. “Zombie Vortices: The Dead Zones of Protoplanetary Disks are Not Dead.”
- American Physical Society, Division of Fluid Dynamics, November 2014, San Francisco, CA. **Barranco, J.**, Marcus, P., Pei, S., Jiang, C.-H., Hassanzadeh, P., Lecoanet, D. “Zombie Vortices: Angular Momentum Transport and Planetesimal Formation.”
- American Astronomical Society, January 2014, Washington, D.C. White, A., **Barranco, J.**, Marcus, P., Solari, O., Sayanagi, K. “Applying Advection-Corrected Correlation Image Velocimetry Techniques to Saturn’s Winds.”
- American Physical Society, Division of Fluid Dynamics, November 2013, Pittsburgh, PA. Pei, S., Marcus, P., Jiang, C.-H., Hassanzadeh, P., Lecoanet, D., **Barranco, J.**, “Noise and Turbulence Generate 3D Zombie Vortices in Stably Stratified Rotating Shear Flows.”
- American Physical Society, Division of Fluid Dynamics, November 2013, Pittsburgh, PA. Marcus, P., Pei, S., Jiang, C.-H., Hassanzadeh, P., **Barranco, J.**, Lecoanet, D. “3D Zombie Vortices in Rotating Stratified Shear.”
- American Astronomical Society, January 2013, Long Beach, CA. Madera, D., **Barranco, J.** “Simulations of the Dynamics of Coupled Gas and Dust in Protoplanetary Disks.”
- American Astronomical Society, January 2013, Long Beach, CA. **Barranco, J.**, Chiang, E. “The Effect of Dust Self-Gravity on the Kelvin-Helmholtz Instability of Settled Dust Layers in Protoplanetary Disks.”
- American Physical Society, Division of Fluid Dynamics, November 2012, San Diego, CA. **Barranco, J.**, Madera, D. “Dust Settling in Protoplanetary Disks with a Terminal Velocity Approach.”
- American Physical Society, Division of Fluid Dynamics, November 2012, San Diego, CA. Hadley, E., **Barranco, J.** “Simulations of MHD Instabilities in Protoplanetary Disks.”

August 2007 – September 2012

- American Physical Society, Division of Fluid Dynamics, November 2010, Long Beach, CA. **Barranco, J.**, Lee, A., Chiang, E., Asay-Davis, X. “Dust Settling in Protoplanetary Disks and the Onset of Kelvin-Helmholtz Instability.”
- American Physical Society, Division of Fluid Dynamics, November 2010, Long Beach, CA. Kamal, S., **Barranco, J.**, Marcus, P. “3D Vortices in Protoplanetary Disks.”
- American Astronomical Society, January 2009, Long Beach, CA. Penev, K., Sasselov, D., **Barranco, J.**, Demarque, P., Robinson, F. “Dissipation Efficiency of Turbulent Convection.”
- American Astronomical Society, January 2009, Long Beach, CA. Giguere, M., Ader, T., Barnes, R., **Barranco, J.**, Fischer, D. “A GUI for Modeling Multiple Planet Systems.”
- Large Meteorite Impacts and Planetary Evolution IV, August 17–21, 2008, Vredefort Dome, South Africa. LPI Contribution No. 1423, paper id. 3075, Marcus, R., Stewart, S., **Barranco, J.**, Hernquist, L., Sasselov, D. “SPH Simulations of Planetary-Scale Impacts.”
- American Astronomical Society, January 2008, Austin, TX. Hartman, J., Gaudi, B.S., Holman, M., McLeod, B., Stanek, K., Pinsonneault, M., **Barranco, J.**, Meibom, S., Kalirai, J. “A Deep Transit Survey of the Open Cluster M37 with the MMT.”
- American Physical Society, Division of Fluid Dynamics, November 2007, Salt Lake City, UT. Marcus, P., **Barranco, J.** “Transport by Vortices in Protoplanetary Disks.”
- American Physical Society, Division of Fluid Dynamics, November 2007, Salt Lake City, UT. Asay-Davis, X., **Barranco, J.**, Marcus, P. “Planetesimal Formation: Trapping Dust in 3D Vortices.”
- American Astronomical Society, Division of Planetary Sciences, October 2007, Orlando, FL. **Barranco, J.**, Trilling, D., Gaudi, B.S., Holman, M., DePoy, D. “A Survey for Extreme Mass-Ratio Binaries of Faint Kuiper Belt Objects.”
- American Astronomical Society, Division of Planetary Sciences, October 2007, Orlando, FL. Asay-Davis, X., **Barranco, J.**, Marcus, P. “Planetesimal Formation: Trapping Dust in 3D Vortices.”

 Prior to August 2007

- American Astronomical Society, Division of Planetary Sciences, October 2006, Pasadena, CA. Fuentes, C., Holman, M., Gaudi, B.S., **Barranco, J. A.**, Trilling, D. “Ground-based Imaging Of Pluto’s Satellites, Hydra And Nix.”
- American Astronomical Society, Division of Planetary Sciences, October 2006, Pasadena, CA. **Barranco, J.** “Three-Dimensional Simulations of Kelvin-Helmholtz Instabilities of Dust Sublayers in the Midplanes of Protoplanetary Disks.”
- Transiting Extrasolar Planets Workshop ASP Conference Series, Vol. 366, Proceedings of the conference held 25-28 September, 2006 at the Max Planck Institute for Astronomy in Heidelberg, Germany. Edited by C. Afonso, D. Weldrake, and Th. Henning. San Francisco: Astronomical Society of the Pacific, 2007, p.64. Hartman, J., Gaudi, B.S., Holman, M., McLeod, B., Stanek, K., **Barranco, J.** “A Search for Transiting Hot Planets as Small as Neptune in the Open Cluster M37.”
- American Astronomical Society, January 2006, Washington, DC. **Barranco, J.A.** “Kelvin-Helmholtz Instability in the Dusty Midplane of Protoplanetary Disks.”
- American Astronomical Society, January 2005, San Diego, CA. **Barranco, J.A.** & Marcus, P.S. “Three-Dimensional Vortices in Stratified Protoplanetary Disks.”
- Ringberg Workshop on Planet Formation: Theory Meets Observation, December 2004, Rottach-Egern, Bavaria, Germany. “Planet Embryos in Vortex Wombs.”
- American Geophysical Union, December 2003, San Francisco, CA. **Barranco, J.A.** & Marcus, P.S. “Planet Embryos in Vortex Wombs.”
- The Search for Other Worlds: Fourteenth October Astrophysics Conference at the University of Maryland, October 2003, College Park, MD. **Barranco, J.**, “Planet Embryos in Vortex Wombs.”
- American Astronomical Society, Division of Planetary Sciences, September 2003, Monterey, CA. **Barranco, J.A.** & Marcus, P.S. “Planet Embryos in Vortex Wombs.”
- American Astronomical Society, January 2003, Seattle, WA. **Barranco, J.A.** & Marcus, P.S. “Planet Embryos in Vortex Wombs.”
- American Physical Society, Division of Fluid Dynamics, November 2002, Dallas, TX. **Barranco, J.A.** & Marcus, P.S. “Planet Embryos in Vortex Wombs.”
- American Physical Society, Division of Fluid Dynamics, November 2002, Dallas, TX. Lin, H., **Barranco, J.A.** & Marcus, P.S. “Cross-stream transport of mass and momentum by 3D vortices.”
- American Astronomical Society, Division of Planetary Sciences, November 2001, New Orleans, LA. **Barranco, J.A.** & Marcus, P.S. “Vortices in Protoplanetary Disks and the Formation of Planetesimals.”
- American Physical Society, Division of Fluid Dynamics, November 2001, San Diego, CA. **Barranco, J.A.** & Marcus, P.S. “Vortices in Protoplanetary Disks and Their Role in Planet Formation.”
- American Physical Society, Division of Fluid Dynamics, November 2000, Washington, DC. **Barranco, J.A.** & Marcus, P.S. “Accumulation of Dust Grains within Vortices and its Role in Planet Formation.”
- American Physical Society, Division of Fluid Dynamics, November 1999, New Orleans, LA. **Barranco, J.A.** & Marcus, P.S. “The Role of Vortices in the Formation of Stars and Planets.”
- American Physical Society, Division of Fluid Dynamics, November 1998, Philadelphia, PA. **Barranco, J.A.** & Marcus, P.S. “An Application of Matrix Perturbation Theory to the Stability of Trailing Wake Vortices.”
- American Physical Society, Division of Fluid Dynamics, November 1997, San Francisco, CA. **Barranco, J.A.** & Marcus, P.S. “Destabilization of Trailing Wake Vortices.”
- Goodman, A.A., **Barranco, J.A.**, Wilner, D.J., & Heyer, M.H. 1998, “Velocity Coherence in Dense Cores,” *Astrophys. Lett. & Comm.*, 37, 109.
- Goodman, A.A., **Barranco, J.A.**, Wilner, D.J., & Heyer, M.H. 1997, “Velocity Coherence in Dense Cores,” in *Star Formation Near and Far: Seventh Astrophysics Conference*, ed. S.S. Holt, L.G. Mundy (Woodbury, N.Y.: AIP Press), 393, 105.
- Goodman, A.A., **Barranco, J.A.**, Wilner, D.J., & Heyer, M.H. 1996, “Velocity Coherence in Dense Cores,” in *CO: Twenty-Five Years of Millimeter-Wave Spectroscopy*, Proceedings of the 170th Symposium of the IAU, Tucson, AZ, May 29–June 5, 1995, ed. W. Latter, S.J.E. Radford, P.R. Jewell, J.G. Mangum, & J. Bally (Dordrecht: Kluwer), p.116.
- Goodman, A.A. & **Barranco, J.A.** 1994, “Velocity Structure in Dense Cores,” in *Clouds, Cores, and Low Mass Stars*, ed. D. Clemens & R. Barvainis (San Francisco: Astronomical Society of the Pacific Conference Proceedings), 65:57–66.

Contributions to Campus & Community

Contributions to Campus

- 08/2010 – present – **Undergraduate Major Advisor**. Meet one-on-one with undergraduates to go over their schedules and academic programs so that they remain on track to graduate. I advise them on tutoring resources, mentoring programs, scholarships, research opportunities, and graduate programs.
- 10/2009 – present – **Physics Curriculum Committee**. Department standing committee whose focus is to make revisions to the B.A. & B.S. physics degrees, including how to implement the GVAR requirement (Graduate Writing Assessment Requirement).
- 09/2008 – present – **Astronomy Curriculum Committee**. Department standing committee whose focus is to make revisions to the B.A. astronomy and B.S. astrophysics degrees, including how to implement the GVAR requirement (Graduate Writing Assessment Requirement). The committee developed a M.S. Physics w/ Astrophysics Concentration in Spring 2013.
- 08/2017 – 05/2018 – **Provost Search Committee**.
- 08/2016 – 06/2017 – **Course Revision with Technology (CRT)**. This is a CSU Chancellor's Office program. To encourage more student engagement in class with more challenging and relevant examples and applications, I proposed to "flip" Physics 220: General Physics w/ Calculus I. I developed basic lecture content in online videos, and created clicker questions to foster conceptual understanding and in-class work-sheets for group activities that step students through more complex examples and/or challenging applications. My eportfolio describing the process to flip the class can be found here: <https://contentbuilder.merlot.org/toolkit/html/snapshot.php?id=44345100172185>.
- 07/206 – **Affordable Instruction Materials Award**. Award for reducing cost to students of introductory physics sequence by over 30%.
- 01/2016 – 05/2016 – **Administrative Review Committee**. Five year review of Dean of Faculty Affairs.
- 08/2015 – 05/2016 – **Chair, Search Committee for Asst./Assoc. Professor of Physics/Astronomy Education Research**.
- 08/2014 – 05/2015 – **College of Science & Engineering Dean Search Committee**.
- 05/21/2015 – Dept. of Physics & Astronomy representative at the University Undergraduate Honors Convocation.
- 08/2011 – 05/2014 – **SFSU Academic Senate**. Standing committees: Curriculum Review & Approval Committee (CRAC) & Education Policies Committee (EPC), 08/2011 – 05/2014. Chair of CRAC and Vice Chair of EPC in 2013-2014; Executive Committee, 08/2013 – 05/2014.
- 11/13/2014 – Dept. of Physics & Astronomy representative for College of Science & Engineering Donor Recognition & Scholarship Awards Dinner.
- 06/2012 – 12/2013 – **Course Outline of Record Evaluator (CORE) for the CSU-wide Course Identification Numbering System (C-ID)**. Evaluators are appointed by the CSU Academic Senate. The C-ID system is a supra-numbering system for common transferable courses taught in both community colleges and the CSU system. The goal is to make the transfer process more transparent and effective for students. As an evaluator, I reviewed physics course syllabi from community colleges to make sure they met agreed-upon standards so that these courses can more easily transfer to the CSU system.
- 04/13/2013 – Presenter, College of Science & Engineering "Sneak Peak" for prospective SFSU students.
- 08/2012 – 05/2013 – **Search Committee for Asst./Assoc. Professor of Astronomy**.
-
- 08/2011 – 05/2012 – **Search Committee for Asst./Assoc. Professor of Astronomy**.
- 05/04/2012 – Judge for the College of Science & Engineering Student Project Showcase.
- 04/14/2012 – Represented the Dept. of Physics & Astronomy at SFSU Sneak Preview. Gave short presentation describing the department, and afterward met with prospective students and their parents and answered questions.
- 10/18/2011 – Attended the SFSU Science & Technology Theme Community annual fall formal dinner and interacted with undergraduate students who are majoring in science and engineering.
- 08/19/2011 – Gave presentation to approximately 12 new and returning math/science/business tutors in the Campus Academic Resource Program (CARP) on how to be a more effective peer tutor.
- 02/08/2011 – Gave a mock science press conference on my scientific research to students in Science 560: Science Writing. Students acted as journalists, and I answered questions on my research in language that a layperson could understand. One student was selected to interview me one-on-one and write an article for InterSci, the student journal for the College of Science & Engineering. Article to appear in Spring 2013 issue.

- 09/27/2010 – Attended the SFSU Science & Technology Theme Community annual fall formal dinner and interacted with undergraduate students who are majoring in science and engineering.
- 05/23/2009 – Served as a Faculty Marshal at the 2009 SFSU Commencement.
- 11/12/2008 – Presented talk “Planet Embryos in Vortex Wombs: The Origin of Planetary Systems” at the annual dinner of the SFSU Science & Technology Theme Community. This talk was aimed at undergraduate physical science students. After public talk, answered general astronomy & astrophysics questions.
- 08/12/2008 – Served on a panel “The View After Year Two” at the New Faculty Orientation. Shared experiences from my first year as an assistant professor and helped new faculty brainstorm ways to balance teaching, research, and service.
- 02/28/2008 – Judge of SFSU applicants in the physical and mathematical science division in the CSU Student Research Competition. Evaluated written and oral presentations from undergraduate and graduate students in the College of Science & Engineering and made recommendations on who should proceed to CSU level competition.
- 01/22/2008 – Presented a research talk “Planet Embryos in Vortex Wombs” at the SFSU College of Science & Engineering (COSE) 2008 College Retreat. This talk was aimed at other science professors at SFSU, focussing on opportunities for collaborative research on planet formation among different departments in COSE.

Contributions to Community

- 08/21/2017 – Was in-studio guest scientist on KTVU (Channel 2 Oakland) for live coverage of Great American Solar Eclipse. Answered questions about the eclipse and eclipse safety from hosts of the morning show “The 9.” See: <http://www.ktvu.com/solar-eclipse>.
- 08/21/2017 – Gave interview to S.F. Examiner on Great American Solar Eclipse. See: <http://www.sfexaminer.com/sf-readies-glimpse-rare-solar-eclipse/>.
- 05/29/2016 – 06/08/2016 – College Board/Educational Testing Service (ETS) Reader (grader) for the Advanced Placement Physics exams in Kansas City, MO.
- 05/29/2015 – 06/08/2015 – College Board/Educational Testing Service (ETS) Reader (grader) for the Advanced Placement Physics exams in Kansas City, MO.
- 08/01/2013 – I appeared on an episode of “Distort”, which is “the show that distorts time to show you things your eyes might otherwise miss.” “Distort” was a webshow on TestTube, a former education and documentary internet and app channel network under Discovery Digital Networks. Episode was posted online on August 1, 2013. See: <https://www.youtube.com/watch?v=AvKJ9DcaJ8M>.
- 06/02-08/2013 – College Board/Educational Testing Service (ETS) Reader (grader) for the Advanced Placement Physics exams in Kansas City, MO.
- 10/04/2012 – Yocha Dehe Winton Nation Academy College & Career Day. Represented San Francisco State University for college & career day at this tribal school for the Native American community in Brooks, CA. I brought two SFSU graduate students, who spoke with students and community members about studying physics and astronomy and future career goals.
-
- 06/02-08/2012 – College Board/Educational Testing Service (ETS) Reader (grader) for the Advanced Placement Physics exams in Kansas City, MO.
- 05/24/2011 – Helped evaluate multiple-choice assessment test on the Nature of Science (NOS) being developed by the Harvard-Smithsonian Center for Astrophysics Education Department as part of a National Research Council (NRC) & National Science Foundation (NSF) project on middle-school science education.
- 08/11/2009 – Led a professional development seminar for the San Francisco Unified School District’s Working to Improve Science Education (WISE) Summer Institute. Participants in the seminar were SFUSD public elementary school teachers. I set-up eight hands-on physics experiments & demonstrations in static electricity, fluid dynamics, light and optics, and thermodynamics using inexpensive and common supplies. Teachers cycled through the stations trying the experiments for themselves. I then led a brainstorming session on how to make the material accessible to elementary school students.
- 06/17/2009 – Presented “An Evening with the Stars” with SFSU graduate student Shannon Lee to the Cal State East Bay Upward Bound retreat. Students were high school students from economically disadvantaged backgrounds. Shannon and I lead the students on a “walking tour” of a scale-model of the Solar System.
- 04/22/2009 – Presented a public talk “Planet Embryos in Vortex Wombs: The Origin of Planetary Systems” to the CCSF–SFSU Bridges to the Baccalaureate Program at City College San Francisco. This talk was aimed at community college science students. After public talk, answered general astronomy & astrophysics questions.

- 02/18/2009 – Discussed careers in physics & astronomy to three classes of middle school students at Willie L. Brown, Jr. Preparatory College Academy. Shared my life story and struggles as a beginning science student and my fascination with outer space. Answered questions on why and how I became a scientist.
- 09/09/2008 – Presented a public talk “Planet Embryos in Vortex Wombs: The Origin of Planetary Systems” to the Dept. of Astronomy at City College of San Francisco. This talk was aimed at community college students. After public talk, answered general astronomy & astrophysics questions.
- 05/09/2008 – Presented a public talk “Planet Embryos in Vortex Wombs: The Origin of Planetary Systems” to the Peninsula Astronomical Society at Foothill College. This talk was aimed at laypeople and amateur astronomers. After public talk, answered general astronomy & astrophysics questions.
- 11/02/2007 – Presented a public talk “Planet Embryos in Vortex Wombs” to the San Mateo County Astronomical Society at the College of San Mateo. This talk was aimed at laypeople and amateur astronomers. After public talk, answered general astronomy & astrophysics questions.
- 08/04/2007 – Assisted with a campus tour of SFSU for the Berkeley Scholars to Cal (BSC) program, a mentoring program for economically disadvantaged students (especially African-American, Chicano/Latino, Native American) high school students. Encouraged students to consider applying to SFSU. Discussed opportunities for undergraduates at SFSU to participate in scientific research with faculty.

Contributions prior to SFSU

- **Science Education Consultant, Banneker Charter Public School**, Fall 2006 – Fall 2007: I led professional development workshops to help train the teachers at this math/science-focused K-8 public charter school that serves a 100% minority (mostly African-American & Latino) student population.
- **Workshop Leader for Graduate Student Instructor Teaching & Orientation Conference**, Fall 2000 & Fall 2001: Led workshops to train incoming graduate students at Berkeley on how to be more effective teachers in the physical sciences.
- **Graduate Student Instructor/Tutor for Physics Scholars Program (PSP)**, August 1999 – December 2000: PSP is a tutoring/mentoring program for women and minority (African-American, Latino, & Asian) undergraduate students in the physical sciences and engineering.
- **Department of Astronomy, Teaching Committee**, 1997-2000: Graduate student representative on committee for teaching and curriculum issues.
- **Berkeley Black Graduate Engineering & Science Students Association Science Fair**, 1997-1998: Mentored high-school students from Oakland Technical High School.
- **Black & Latino Violence Prevention Project**, Stiles Hall, 1996–1998: Mentored three “at-risk” young men from inner-city Oakland.
- **American Association for the Advancement of Science – Boston Black Church Project (AAAS–BBC)**, 1994-1995: Site coordinator; developed hands-on, interactive science curriculum for after-school tutoring programs that outreached to African-American/Latino youth in the city of Boston.
- **Bruce Wall Ministries, Inc.**, 1993–1995: Program Coordinator and Lead Tutor at PROJECT 21, an after-school tutoring program for inner-city youth in Boston; Mentor in Gangs Anonymous, a support group for young men formerly involved in gangs; Science Coordinator for Camp Ozioma, a summer program for 50 inner-city youth.