ELIZA J. MORRIS

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EDUCATION

Harvard University, Cambridge, MA
PhD, Applied Physics, graduated May 2014

California State University, Sacramento, Sacramento, CA
BS, *magna cum laude*, Physics, graduated May 2005

TEACHING EXPERIENCE

California State University, Sacramento, Sacramento, CA
Assistant Professor in Physics, August 2018 – present

- Taught introductory physics lectures and labs, including PHYS 11A (mechanics) and PHYS 11C (electricity and magnetism). Restructured the *General Physics:* Mechanics lab/lecture sequence to integrate labs with lectures and introduce a hierarchical team structure with peer leaders. Engaged students in the development of an exploratory lab on forces and friction.
- Taught upper division physics course: PHYS 124 *Thermodynamics and Statistical Mechanics*. Developed new active learning activities as part of the Sac State Center for Teaching and Learning.
- Taught physics course: PHYS 30, *Science and Psuedoscience*. Developed a set of 6 new case study modules for the course and produced a misinformation board game in conjunction with the Powerhouse Science Center.

California State University, Sacramento, Sacramento, CA
Faculty Learning Community, SIRIUS II: Community of Transformation, June 2021 – present

- Designing an Authentic Learning Experience (ALE) investigating how an upcoming embankment construction project will impact river turbidity, flow, temperature, and the concentration of microplastics.

Faculty Learning Community, Inclusive Teaching for Equitable Learning, July 2021 – August 2021

- Developed learner centered strategies that promote inclusivity and help foster positive learning environments. Received ACUE microcredential in Inclusive Teaching for Equitable Learning.

Faculty Summer Workshop, ASPIRE, June 2021

- Constructed frameworks to allow students to develop individualized leadership.

Faculty Learning Community, Equity, Analytics, and Active Learning Online, Sep. 2020 – May 2021

- Developed learner centered strategies that promote inclusivity and help foster positive learning environments in online settings. Received ACUE microcredential in Promoting Active Learning Online.

Faculty Learning Community, STEM Zone, Jan. 2019 – Dec. 2020

- Interactive training designed to help educators develop learner centered strategies that promote inclusivity and help foster positive learning environments.

California State University, Sacramento, Sacramento, CA
STEM Education Research Collaborative, Jan. 2019 – present

- Literature review and discussions about science education and recent advances in scientific teaching pedagogy. Presented research progress on novel pedagogical enhancements.

California State University, Sacramento, Sacramento, CA
Lecturer in Physics, January 2017 – August 2018

- Taught 4 introductory physics lectures and 6 introductory physics labs. Modified existing lab worksheets to further investigate lecture concepts. Engaged students in the development of a series of interactive demonstrations.

University of California, Davis, Davis, CA
Learner-Centered Teaching Workshop, July 2016 – August 2016

- Interactive training in designing and implementing learner-centered teaching. Developed a model class, incorporating numerous aspects of active learning into a mock syllabus.

University of California, Davis, Davis, CA
Guest Lecturer, May 2016

- Taught lectures covering analytical and numerical solutions of ordinary and partial differential equations.

Harvard Kennedy School of Government, Cambridge, MA
Lead Teaching Assistant, Jan. 2014 – May 2014

- Facilitated lectures. Assisted students with analysis memos and projects.

Harvard Kennedy School of Government, Cambridge, MA
Teaching Assistant, Jan. 2013 – May 2013

- Assisted students with analysis memos and projects. Graded assignments.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
Lab Teaching Assistant, Sept. 2010 – Dec. 2012

- Guided undergraduate students in designing and implementing laboratory experiments.

RESEARCH AND MENTORING EXPERIENCE

California State University, Sacramento, Sacramento, CA
Research Advisor, January 2017 – present
Mentored 6 student researchers, resulting in 17 student presentations, 9 student awards, and 2 publications.

- Hila Swindell (3 presentations, travel award, presentation award)
- Hai Tran (1 presentation, 1 peer-reviewed publication)
- Nicholas Sanders (3 presentations, travel award)
- Chris Carnahan (4 presentations, travel award, research award: SURE Summer 2019)
- Jeff Cavanaugh (5 presentations, 1 peer-reviewed publication, travel award, 2 research awards: P-SURE Summer 2019, SURE Summer 2020)
- Prince Yadav (1 presentation, research award: W-SURE Summer 2021)

California State University, Fresno, Fresno, CA
2019 Ideas Lab Challenge: The Food-Health-Ecosystem Trilemma, September 2019

- Participated in the 2019 Ideas Lab Challenge, designed to catalyze innovative, exciting research projects addressing food, energy, water and land issues that are part of California's food-health-ecosystem trilemma.

California State University, Sacramento, Sacramento, CA
Faculty Learning Community, CORPS, August 2017 – June 2019

- Participated in the CORPS FLC, a group of researchers interested in identifying and pursuing appropriate grants and helping each other in preparing those grant applications.

University of California, Davis, Davis, CA
Postdoctoral Fellow, September 2015 – September 2016

- Developed computational models for bioengineered cellular communication and protein self-assembly.

Harvard University, Cambridge, MA
Postdoctoral Fellow, June 2014 - August 2015

- Modeled and experimentally quantified variations in two-phase flow in micro-porous media.

Center for the Environment, Harvard University, Cambridge, MA
Energy and Environment Graduate Consortium Fellow, September 2012 - May 2014
- Interdisciplinary training in broad, interconnected issues of energy and environment.

Water Security Initiative, Harvard University, Cambridge, MA
Water Policy Research Fellow, October 2011 - May 2012
- Analyzed climate and hydrology models of the Colorado River Basin.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
Research Mentor, January 2011 - May 2011
- Mentored 1 undergraduate independent study project, resulting in 1 poster presentation and 1 poster award.

Department of Energy, Washington, DC
Summer Research Scholar, June 2008 - August 2008
- Modeled energy technology adoption and diffusion with multiple decision makers.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
Research Assistant, June 2007 - May 2014
- Designed and led magnetic tweezing and rheological experiments on biopolymer networks.

Center of Membrane Physics, Southern Denmark University, Odense, Denmark
Fulbright Research Fellow, September 2005 - June 2006
- Developed novel experimental methods using AFM and fluorescence microscopy to study lipid mixtures.

CERN (European Center for Nuclear Research), Geneva, Switzerland
Summer Undergraduate Research Fellow, June 2004 - Sept. 2004
- C++ programming of cross-section normalizations and Monte Carlo simulations.

NIST (National Institute of Standards and Technology), Gaithersburg, MD
Summer Undergraduate Research Fellow, May 2003 - Sept. 2003
- Developed automated electronic locking techniques for doppler-free two-photon laser spectroscopy.

LEADERSHIP EXPERIENCE AND SERVICE

Women in STEM Education (WISE) Faculty and Staff Association (FSA)
Founding Co-Chair, Nov 2021 – present
- The mission of the WISE FSA is to increase the representation and the advancement of women faculty in STEM.

National Science Foundation Inclusive STEM Teaching Project
Faculty Fellow, Sep 2021 – present
- One of three University representatives, part of a national professional learning/development community for STEM faculty to implement inclusive teaching strategies in STEM disciplines.

Conference for Undergraduate Women in Physics Consortium
Sac State representative, Aug 2021 – present
- Organizational efforts for future CUWiP conferences, such as the development of annual funders, recruiting speakers, panelists, and workshop leaders, and organizing volunteer base for the events.

California State University, Sacramento, Sacramento, CA
Division of Inclusive Excellence Diversity Hiring Faculty Fellow, Aug 2021 – present

- Support departments by highlighting inclusive hiring practices and providing feedback as they proceed forward with their faculty searches and hiring processes.

Physical Review Physics Education Research Journal
Journal reviewer, Jan 2021 – present
- Served as peer reviewer on 2 articles.

California State University, Sacramento, Sacramento, CA
College of Natural Sciences and Mathematics Equity and Inclusion Working Group, Aug 2020 – present
- Served as the physics department representative on the college Equity and Inclusion Working Group.

California State University, Sacramento, Sacramento, CA
Society of Physics Student Club Advisor, Aug 2018 – present
- Coordinated outreach opportunities and events with the Sac State SPS Club.

California State University, Sacramento, Sacramento, CA
Women in Physics Club Advisor, Jan 2019 – June 2020
- Assisted in the development of the new Women in Physics club. Worked together with students to develop and submit an application to the American Physical Society for grant funding to help officially launch the new club.

Folsom Cordova Unified School District School Readiness Project, Rancho Cordova, CA
Volunteer, Quarterly Jan 2017 – Dec 2018
- Organized and led biophysics demonstrations for children.

Center for the Environment, Harvard University, Cambridge, MA
Winter Term Energy Policy Course Designer, Dec. 2012 – Jan. 2013
- Developed a winter term workshop on hydraulic fracturing, sourced materials, and recruited speakers.

Harvard College Women's Center, Cambridge, MA
Undergraduate Mentor, Sept. 2009 - May 2012
- Mentored 3 female undergraduate STEM students. Provided guidance in course selection, research pursuits, and ultimately on job applications. All 3 mentees moved on to highly successful careers.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
National TEAMS Competition Event Organizer, Sept. 2008 – May 2013
- Recruited local schools. Organized tours, speakers, catering, and space allocations.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
Laboratory Safety Manager, June 2008 – May 2013
- Led lab safety committee of 10 heads of research, organized biweekly lab cleanup of over 50 researchers.

Harvard University, Cambridge, MA
Co-Chair of Harvard Graduate Women in Science and Engineering, June 2008 - May 2010
- Organized group events, oversaw group meetings with GSAS deans, led board meetings.

Harvard University, Cambridge, MA
International Student Mentor, June 2008 - May 2010
- Mentored 2 incoming international graduate students.

Museum of Science, Boston, MA
NanoDays Volunteer, Annually 2008 – 2014
- Organized and led biophysics and nanomaterials demonstrations for children.

Harvard School of Engineering and Applied Sciences, Cambridge, MA
Holiday Science Lecture, Annually 2007 –2012

- Organized materials, set up and facilitated event.

AWARDS

Nov. 2021	Co-PI, CSU Sacramento Curriculum Redesign Grant ($39,273.44)
Sept. 2021	PI, Dept. of Education STEM4Equity, 2-year Course Redesign Minigrant ($101,000)
Sept. 2021	Hu Research Award ($7,500)
Jan. 2021	Senate Assigned Time for Exceptional Levels of Service to Students Award ($7500)
June 2020	Research and Creative Activity Award ($7,500)
June 2020	CSUPERB Curriculum Development Grant ($2,500)
Jan. 2020	Pedagogy Enhancement Award ($5,000)
Jan. 2020	Hu Research Award ($7,500)
Sept. 2019	Associated Students Inc. External Grant ($810)
2019-2020	Awarded 3 Edwin Iloff Student Mentorship Awards ($7,500)
Aug. 2018	Senate Assigned Time for Exceptional Levels of Service to Students Award ($7,500)
April 2014	Dept. of Energy, Better Buildings Case Competition, Most Innovative Award
Sept. 2013	Harvard University Center for the Environment Fellowship ($20,000)
2009-2014	Awarded travel grants for speaking at international conferences
Sept. 2007	3-year Dept. of Defense NDSEG Fellowship ($30,000)
Sept. 2005	Fulbright fellowship to study in Denmark ($25,000)
Aug. 2004	International Society of Optical Engineering (SPIE) Scholarship for Research ($3,000)
May 2004	Outstanding Senior Award for the College of Natural Sciences and Mathematics
May 2004	Chien Hu Senior Physics Award ($4,000)
June 2003	Society of Physics Students Leadership Award ($1,000)
May 2003	Vanderberg Award for Achievement in Physics ($1,000)

PUBLICATIONS

Sac State undergraduate and graduate students underlined; * equal author contribution; † corresponding author.

1. "Kismet/CHD7/CHD8 Affects Gut Biomechanics, the Gut Microbiome, and Gut-Microbiome-Brain Axis in Drosophila Melanogaster."
   A Niosi, NH Võ, P Sundar, C Welch, A Penn, Y Yuldasheva, A Alfareh, K Rausch, T Rukhsar, J Cavanaugh, P Yadav, S Peterson, R Brown, A Hu, A Ardon-Castro, D Nguyen, R Crawford, W Lee, MH Jensen, **EJ Morris**, K Mulligan†.
   PLoS one, submitted, 2021.
2. "In-class Hierarchical Team Model as a No-Cost Strategy to Improve Student Success: Integrated Peer Leadership Program."
   EJ Morris†, MH Jensen, S Ghosh Hajra.
   Phys Rev Phys Ed Res, 17:023104, 2021.
3. "Unexpected scaling of interstitial velocities with permeability due to polymer retention in porous media."
   S Parsa, A Zareei, E Santanach-Carreras, **EJ Morris**, A Amir, L Xiao†, D Weitz†.
   Phys Rev Fluids, 6:L082302, 2021.
4. "Stochastic Ordering of Complexoform Protein Assembly by Genetic Circuits."
   MH Jensen†, **EJ Morris**, H Tran, M Nash, C Tan†.
   PLoS Computational Biology, **16(6)**, 1007997, 2020.
5. "Minimizing Context Dependency of Gene Networks Using Artificial Cells."
   Y Ding*, LE Contreras-Llano*, **E Morris**, M Mao, C Tan†.
   ACS applied materials & interfaces, ***10***, 30137-30146, 2018.
6. "Dynamic biomaterials: toward engineering autonomous feedback."
   E Morris, M Chavez, C Tan†.

Current opinion in biotechnology, **39**, 97-104, 2016.

7. "Mechanics and Dynamics of Reconstituted Cytoskeletal Systems."
   MH Jensen[†], **EJ Morris**, D Weitz.
   Biochim. Biophys. Acta., **1853**, 3038-3042, 2015.
8. "Emergent Properties of Composite Semiflexible Biopolymer Networks."
   MH Jensen[*†], **EJ Morris**[*], R Goldman, D Weitz.
   BioArchitecture, **4**, 138-143, 2014.
9. "Challenge and response in the Colorado River Basin."
   J Robison[†], K Bratrschovsky, J Latcham, **E Morris**, V Palmer, A Villanueva.
   Water Policy, **16**, 12-57, 2014.
10. "Mechanism of Calponin Stabilization of Cross-Linked Actin Networks."
    MH Jensen[*], **EJ Morris**[*], C Gallant, K Morgan, D Weitz, J Moore[†].
    Biophysical Journal, **106**, 793-800, 2014.
11. "*The conformational state of actin filaments regulates branching by actin-related protein 2/3 (Arp2/3) complex.*"
    Editorial featured article.
    MH Jensen[*], **EJ Morris**[*], R Huang[*], G Rebowski, R Dominguez, D Weitz, J Moore, C Wang[†].
    J Biol Chem, **287**, 31447-31453, 2012.
12. "Domain Shapes, Coarsening, and Random Patterns in Ternary Membranes."
    MH Jensen, **EJ Morris**, A Simonsen[†].
    Langmuir, **23**, 8135 -8141, 2007.
13. "Electrodynamics of a Magnet Moving through a Conducting Pipe."
    Editorial featured article.
    MH Partovi[†], **EJ Morris**[†].
    Can. J. Phys., **84**, 253-271, 2006.

INVITED AND PLENARY TALKS

1. "Squishy Physics. Rheology and Food."
   CSUPERB Annual Biotechnology Symposium, Santa Clara, CA, January 2020.
2. "Hello Pinocchio. Engineering Communication in Artificial Cells."
   Chemistry Colloquium Series, California State University, Sacramento, CA, February 2018.
3. "Creepy, crawly, and full of life! Making Mechano-Cells at Sac State."
   Physics Colloquium Series, California State University, Sacramento, CA, February 2018.
4. "Engineering Programmable Dynamic Materials Using Bio-Inspired Communication"
   2016 Winter QBio Meeting, Waikiki, Hawaii, February 2016.
5. "A Comparison of 2D and 3D Flow in Porous Media"
   Interpore Annual Meeting, Padua, Italy, May 2015.
6. "Biophysics: Equations in Motion"
   Physics Colloquium Series, California State University, Sacramento, CA, September 2014.
7. "Dashing Through the Actin"
   MEMPHYS Christmas Colloquium Lecture, University of Southern Denmark, Odense, Denmark, December 2011.
8. "Motion in Cytoskeletal Networks"
   Physics Colloquium Series, California State University, Sacramento, CA, November 2010.
9. "Transport in F-Actin Networks"
   ESF-EMBO Symposium: Emerging Properties of the Cytoskeleton, Sant Feliu de Guixols, Spain, October 2010.
10. "Motion in Cytoskeletal Networks"
    SoftFlow 2009, Cargese, France, July 2009.
11. "The Cell is More than Just Water"
    Topics in Bioengineering Series, Harvard University, Cambridge, MA, April 2009.
12. "Electrodynamics of a Magnet Moving through a Metallic Pipe"
    Physics Colloquium Series, California State University, Sacramento, CA, December 2004.
13. "So a Magnet Goes into a Pipe"

International Conference of Physics Students, Novi Sad, Serbia, August 2004.

OTHER PRESENTATIONS

Sac State undergraduate and graduate students underlined.

1. *Kismet Affects Gut Biomechanics, the Gut Microbiome, and Gut-Brain Axis in Drosophila Melanogaster.*
   Penn A, Raghulan R, Niosi A, Johnson E, Nguyen H, Welch C, Lee W, Jensen MH, **Morris EJ**, Mulligan K.
   West Coast Developmental Biology Snapshot Meeting. (Nov 2021)
2. *Quantifying the Gut Mechanics of Fruit Flies.*
   Yadav P, Jensen MH, **Morris EJ**.
   California State University, Sacramento, NSM Student Research Symposium. (Oct 2021)
3. *Stochastic Ordering of Complexoform Protein Assembly by Genetic Circuits.*
   Jensen MH, **Morris EJ**, Tran H, Nash MA, Tan C.
   Biophysical Society, 65th annual meeting. (Feb 2021)
4. *LabVIEW Programming for Micro-Tensile Testing Instrumentation*.
   Cavanaugh J, Jensen MH, **Morris EJ**.
   California State University, Sacramento, Student Research & Creative Activity Fall Poster Forum. (Nov 2020)
5. *LabVIEW Programming for Micro-Tensile Testing Instrumentation*.
   Cavanaugh J, Jensen MH, **Morris EJ**.
   California State University, Sacramento, NSM Student Research Symposium. (Oct 2020)
6. *Analyzing Structures in Artificial Biological Cells*.
   Carnahan C, Su W-C, Parikh A, **Morris EJ**, Jensen MH.
   California State University, Sacramento, NSM Student Research Symposium. (Oct 2020)
7. *Construction of Optical Tweezers for Microrheological Study of Algae and Bacteria in the American River.*
   Cavanaugh J, Castaneda F, **Morris EJ**, Jensen MH.
   32nd California State University Biotechnology Symposium. (Jan 2020)
8. *It's All About the Mouthfeel - A Rheological Study of Complex Food Materials.*
   Carnahan C, Jensen MH, **Morris EJ**.
   32nd California State University Biotechnology Symposium. (Jan 2020)
9. *Developing Laser-tweezers and Software for Passive and Active Microrheology*.
   Cavanaugh J, Castaneda F, Jensen MH, **Morris EJ**.
   California State University, Sacramento, Student Research & Creative Activity Fall Poster Forum. (Nov 2019)
10. *Rheological Methods in Soft Condensed Matter*.
    Carnahan C, Jensen MH, **Morris EJ**.
    California State University, Sacramento, Student Research & Creative Activity Fall Poster Forum. (Nov 2019)
11. *Developing Laser-tweezers and Software for Passive and Active Microrheology*.
    Cavanaugh J, Castaneda F, Jensen MH, **Morris EJ**.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2019)
12. *Rheological Methods in Soft Condensed Matter*.
    Carnahan C, Jensen MH, **Morris EJ**.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2019)
13. *Optical Traps: Using Lasers to Study the Physics Behind Biology*.
    Castaneda F, Cavanaugh J, **Morris EJ**, Jensen MH.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2019)
14. *Modeling Cells with Giant Vesicles Encapsulating Polymerized Actin Networks.*
    Sanders N, Purushothaman S, Su W-C, Parikh A, **Morris EJ**, Jensen MH.
    31st Annual California State University Biotechnology Symposium. (Jan 2019)
15. *Modeling Cells with Giant Vesicles Encapsulating Polymerized Actin Networks.*
    Sanders N, **Morris EJ**, Jensen MH.

California State University, Sacramento, Student Research & Creative Activity Fall Forum. (Nov 2018)

16. *Modeling Cells with Giant Vesicles Encapsulating Polymerized Actin Networks.*
    Sanders N, **Morris EJ**, Jensen MH.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2018)
17. *The In Vitro Motility Assay Analysis: Manual vs. Automated Methodology.*
    Swindell H, Jensen MH, **Morris EJ**.
    Annual Biomedical Research Conference for Minority Students. (Nov 2017)
18. *The In Vitro Motility Assay Analysis: Manual vs. Automated Methodology.*
    Swindell H, Jensen MH, **Morris EJ**.
    California State University, Sacramento, Student Research & Creative Activity Fall Forum. (Nov 2017)
19. *Case Studies of Self-Assembled Multi-Subunit Biological Structures.*
    Tran H, Jensen MH, **Morris EJ**.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2017)
20. *The In Vitro Motility Assay Analysis: Manual vs. Automated Methodology.*
    Swindell H, Jensen MH, **Morris EJ**.
    California State University, Sacramento, NSM Student Research Symposium. (Oct 2017)
21. *Non-Equilibrium Control of Protein Assembly by Genetic Circuits.*
    Morris EJ, Jensen MH, Nash M, Tan C.
    Human Frontiers Science Program, 17th awardees meeting. (Jun 2017)
22. *How Does the Interplay Between Semiflexible Polymers Determine Composite Network Mechanics?*
    Jensen MH, **Morris EJ**, Goldman RD, Weitz DA.
    Biophysical Society, 59th annual meeting. (Feb 2015)
23. *Enhanced Oil Recovery with Polymer Flooding.*
    Morris EJ, Parsa S, Weitz DA.
    Total North America Meeting, Santa Clara, CA (Feb 2015)
24. *Rheology of Composite Semiflexible Biopolymer Networks.*
    Jensen MH, **Morris EJ**, Weitz DA.
    New England Complex Fluids, 61st Workshop. (Dec 2014)
25. *Oil Retention in 2D vs. 3D Porous Media.*
    Morris EJ, Parsa S, Weitz DA.
    New England Complex Fluids, 61st Workshop. (Dec 2014)
26. *Vimentin Affects Actin Network Percolation and Mechanics.*
    Jensen MH, **Morris EJ**, Weitz DA.
    Biophysical Society, 58th annual meeting. (Feb 2014)
27. *Mechanism of Calponin Stabilization of Cross-Linked Actin Networks.*
    Morris EJ, Erlicher AJ, Weitz DA.
    2014 Biophysical Society Annual Meeting, San Francisco, CA. (Feb 2014)
28. *Intermediate Filament, Vimentin, Strengthens Actin Networks.*
    Morris EJ, Weitz DA.
    2012 American Society of Cellular Biology Annual Meeting, San Francisco, CA. (Dec 2012)
29. *Calcium-Induced Bundling Leads to Rapid Stiffening of Vimentin Networks.*
    Morris EJ, Wu H, Weitz DA.
    Intermediate Filaments Gordon Conference, Lewiston, ME. (Jun 2012)
30. *Challenge and Response in the Colorado River Basin.*
    Robison J, Bratrschovsky K, Latcham J, **Morris E**, Palmer V, Villanueva A.
    Harvard Water Federalism Conference, Cambridge, MA. (Apr 2012)
31. *Motion in Partially and Fully Cross-linked Actin Networks.*
    Morris EJ, Nelson D, Weitz DA.
    2012 American Physical Society March Meeting, Boston, MA. (Mar 2012)

32. *Transport through Actin Networks.*
    Morris EJ, Nelson D, Weitz DA.
    New England Complex Fluids Meeting, Waltham, MA. (Sep 2011)
33. *Heterogeneity and Flow in Cytoskeletal Networks.*
    Morris EJ, Nelson D, Weitz DA.
    2010 Biophysical Society Annual Meeting, San Francisco, CA. (Feb 2010)