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# CURRICULUM VITAE

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Manuel Calderón de la Barca Sánchez

## Personal Information

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## Areas of Interest

### Relativistic Heavy Ion Collisions

My focus is on heavy quark production in heavy ion collisions. My research group is involved in quarkonium measurements with the STAR detector at Brookhaven Lab, and with the CMS experiment at CERN. In both of these experiments, one of the key drivers of my research program is the study bottomonium production in heavy-ion collisions, and the possible modification of the bottomonium meson binding due to color deconfinement in the Quark-Gluon Plasma produced in the collisions. In addition, in the CMS experiment I also study the production of the Z boson. It can be used as a 'standard candle' of the initial state of the collision, since the Z bosons studied via the dimuon and dielectron channels are not expected to be affected by the produced Quark-Gluon Plasma.

### Physics Outreach, Diversity and Inclusion

I am interested in making Physics appealing to a broad audience, particularly among Latino/Latina and women. This includes students at UC Davis, organizations such as SACNAS, and advising student organizations on Diversity and Inclusion at the undergraduate and graduate levels. I work in equity and inclusion at the faculty level through the UC Davis STEAD (Strength Through Equity and Diversity) Committee for faculty hiring. I work in extending knowledge to broad audiences through the NSF funded IMAX film "Secrets of the Universe", where I am Co-PI, science advisor, and featured scientist.

## Education

### Education and Training

1997-2001 Yale University, New Haven, CT, Ph.D., High Energy Nuclear Physics, Dissertation: Charged Hadron Spectra in Au+Au Collisions at  $\sqrt{s_{NN}} = 130$  GeV, [nucl-ex/0111004](https://arxiv.org/abs/hep-ex/0111004)

1997-1999	Yale University, New Haven, CT, M.Sc. M.Phil., Physics
1996-1996	CINVESTAV, Mexico City, Physics, Preliminary graduate studies. Honors.
1991-1995	ITESM, Monterrey, N.L. Mexico, B. Sc., Engineering Physics, Honors (Mención Honorífica). Specialization: Optics & Control Engineering.

## Employment

### Employment History

7/2012-Present	UC Davis, Davis, CA, Professor, Focus on heavy flavor production in heavy ion collisions. Co-leader of UC Davis Heavy-Ion Group. My emphasis is on bottomonium production from p+p, d+Au, and Au+Au collisions in STAR and CMS, and on Z0 and bottomonium production in Pb+Pb collisions in CMS.
7/2008-7/2012	UC Davis, Davis, CA, Associate Professor, Co-convener of the STAR Heavy Flavor Working Group (2/2007-10/2009).
1/2006-7/2008	UC Davis, Davis, CA, Assistant Professor, Responsible for the quarkonium triggers of the STAR experiment during the 2006 RHIC run, and for all heavy flavor triggers since 2007. Developed triggers to perform quarkonium measurements and managed the task force to analyze the data, including the quality assurance of the triggered data, simulation efforts to estimate efficiency, and analysis techniques of the reconstructed data to optimize signal-to-background.
2/2007-10/2009	STAR Collaboration, Upton, NY, Co-convener, Heavy Flavor Working Group, This group focuses on production of particles containing charm and beauty quarks. In addition to quarkonium, this area involves steering the measurements of semi-leptonic decays of heavy flavor quarks, correlations related to heavy quark decays, as well as direct reconstruction of open charm; planning of run scenarios and requests of beam usage related to heavy flavor measurements physics input to planned upgrades to the STAR experiment with relevance to heavy quark measurements.
9/2004-12/2005	Indiana University, Bloomington, IN, Assistant Professor, Laid the groundwork for measurements of heavy flavor production in the STAR Detector during the 2004 Au+Au data taking run. Supervised quarkonium studies, trigger implementations during online data-taking, and analysis of the triggered data offline. Successfully tested the quarkonia triggers into a combined Level-0 (hardware) + Level-2 (software)

9/2003-9/2004	scheme for the first time in the STAR experiment during the 2005 p+p data taking run. Mentor at IU: Steven Vigdor. Brookhaven National Laboratory, Upton, NY, Assistant Physicist, Finalized a study on the prospects for quarkonia measurements in STAR. STAR Deputy Reconstruction Software Leader, focusing on the integration of a new tracking package for STAR. Supervisors at BNL: Dr. Thomas Ullrich and Dr. Timothy Hallman.
12/2001-9/2003	Brookhaven National Laboratory, Upton, NY, Research Associate
1/1997-12/2001	Yale University, Relativistic Heavy Ion Group, New Haven, CT, Research Assistant
6/1996-12/1996	CERN, Geneva, Switzerland, Student, CERN Summer Student Program 1996. Research Assistant, NA49 Experiment. Supervisor: Dr. Andrés Sandoval.

## Extending Knowledge

### Broadcast, Print or Electronic Media

1. Strange Antihyperparticle Created, Newspaper Article, March 30, 2010, UC Davis News.
2. Large Hadron Collider throws lead, Newspaper Article, November 4, 2010, UC Davis News.
3. Heaviest antimatter found, Newspaper Article, April 27, 2011, UC Davis News.
4. Subatomic mythbusters: Confirmed, Website, April 8, 2011, Fermilab Today.
5. Bringing nuclei together breaks quarks apart, Website, July 28, 2011, APS Physics.
6. [Secrets of the Universe](#), Giant Screen/IMAX Film, 2013-present, NSF, K2 Communications.

### Workshops, Conferences, Presentations and Short Courses

1. Hot Quarks: Workshop for young scientists in ultra relativistic heavy-ion physics, Organizer, Early career heavy-ion physicists, Puerto Rico, 2012, 70 Attendees.
2. The strongest force in Nature, Keynote Speaker, Undergraduate women and minority students, SACNAS Chapter, UC Davis, Dinner with Professionals, May 2014, 50 Attendees.
3. The Physics of the LHC, Invited Speaker, Senior citizens, Osher Lifelong Learning Institute, October-November 2014, 30 Attendees.
4. The Strongest Force in Nature, Colorful Gluons, and Beautiful Quarks, Invited Speaker, Families with young children, AAAS Conference, Family Science Days, 14/Feb/2015, 80 Attendees.
5. The Strongest Force in Nature: A path, Keynote Speaker, CALESS Science Extravaganza, April 2015, 150 Attendees.
6. Helmholtz Research School Quark Matter Studies: Lecture Week on Heavy Flavor, Invited Speaker, Graduate Students, Ecole de Mines, Nantes, France, October 2015,

22 Attendees.

## Grants and Contracts

### Grants Active

- 07/01/2014 - 08/31/2019 Grant #1322527, Co-Principal Investigator, Full-Scale Development: Secrets of the Universe, Mark Kresser (Principal Investigator, K2 Communications), National Science Foundation
- 07/01/2018 - 06/30/2021 Grant #1812398, Co-Principal Investigator, Experimental Studies of the Properties of the QGP and the QCD Phase Diagram, Daniel Cebra (Principal Investigator), National Science Foundation
- 05/01/2016 - 04/30/2019 Grant #1560482, Co-Principal Investigator, REU Site: Physics Research at UC Davis, Rena Zieve (Principal Investigator), National Science Foundation

### Grants Completed

- 04/01/2007 - 03/31/2013 Grant #0645773, Principal Investigator, CAREER: Studies of Heavy Quarkonium Production in Relativistic Heavy-Ion Collisions at UCD, National Science Foundation
- 08/01/2010 - 12/31/2012 Grant #1038404, Principal Investigator, Hot Quarks 2010 - A Workshop on The Physics of Ultrarelativistic Nucleus-Nucleus Collisions for Young Scientists, National Science Foundation
- 08/01/2011 - 09/30/2014 Grant #1068833, Co-Principal Investigator, Quantifying Key Properties of the Quark-Gluon Plasma, Daniel Cebra (Principal Investigator), National Science Foundation
- 07/15/2014 - 09/30/2018 Grant #1404281, Co-Principal Investigator, Studies of the Quark-Gluon Plasma with STAR and CMS at UC Davis, Daniel Cebra (Principal Investigator), National Science Foundation
- 07/01/2013 - 06/30/2014 Principal Investigator, UC MEXUS, UC Davis University Outreach and International Progs. (UOIP)
- 04/15/2013 - 03/31/2017 Grant #1004848, Co-Principal Investigator, REU Site: Physics at UC Davis, Rena Zieve (Principal Investigator), National Science Foundation

## Selected Recent Publications

2017 V. Khachatryan, M. Calderón de la Barca Sánchez, et al. (CMS)

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Collaboration). **Suppression of  $\Upsilon(1S)$ ,  $\Upsilon(2S)$ , and  $\Upsilon(3S)$  quarkonium states in PbPb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV.** Physics Letters B, 770: 357.

- 2017 A. M. Sirunyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Relative Modification of Prompt  $\psi(2S)$  and  $J/\psi$  Yields from pp to PbPb Collisions at  $\sqrt{s_{NN}} = 5.02$  TeV.** Physical Review Letters, 118: 162301.
- 2017 A. M. Sirunyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Observation of Top Quark Production in Proton-Nucleus Collisions.** Physical Review Letters, 119: 242001.
- 2018 A. M. Sirunyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Suppression of Excited  $\Upsilon$  States Relative to the Ground State in Pb-Pb Collisions at  $\sqrt{s_{NN}} = 5.02$  TeV.** Physical Review Letters, 120: 142301.
- 2019 A.M.Sirunyan, M. Calderón de la Barca Sánchez, et al., (CMS Collaboration). **Measurement of nuclear modification factors of  $\Upsilon(1S)$ ,  $\Upsilon(2S)$ , and  $\Upsilon(3S)$  mesons in PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV.** Physics Letters B, 790: 270.

## Honors & Awards

- 1991-1995 Programa Suplementario de Educación. ITESM extra-curricular merit program consisting of seminars, workshops and language courses with focus on development of leadership, team integration and problem solving skills as well as cultural interests and activities.
- 1996 Verano Científico Fellowship. Award sponsored by the Mexican Physical Society, Division of Particles and Fields for students to participate in high energy physics experiments at CERN.
- 2007 NSF CAREER: Faculty Early Career Development Award. Proposal: Studies of Heavy Quarkonium Production in Relativistic Heavy-Ion Collisions at UC Davis.
- 2009 MLK/César Chávez/Rosa Parks Visiting Professor. Award to visit Wayne State University in Detroit and to visit several Detroit Public Schools to speak with elementary school students about life as a physicist.
- 2010 UC Davis, Mathematical and Physical Sciences Division, Research Award.
- 2012-13 Association of Students of UCD Nominee for Excellence in Education.
- 2013-14 UC Davis Distinguished Teaching Award
- 2013-14 European Physical Society High Energy and Particle Physics Prize, for an outstanding contribution to High Energy Physics, awarded to the ATLAS and CMS collaborations, “for the discovery of a Higgs boson, as

2013-14 predicted by the Brout-Englert-Higgs mechanism".  
2015 SACNAS UC Davis Chapter Award for "Commitment to Students"  
"Soaring to New Heights Faculty Citation" Award from UC Davis Diversity and Principles of Community Awards, for work in the Strength Through Equity and Diversity (STEAD) Committee.

### Invited Talks

- 2000 February 20, **Hadron Spectra with the STAR Detector: A Probe for Hot and Dense Nuclear Matter**, Lake Louise Winter Institute, Lake Louise, Alberta, Canada.
- 2000 October, **STAR Results from Charged Hadron Spectra at RHIC**, RIKEN-BNL Seminar, Brookhaven National Laboratory, Upton, New York.
- 2000 October 4, **Charged Hadron Spectra with the STAR Detector at RHIC**, American Physical Society Division of Nuclear Physics, Fall '00 Meeting, Williamsburg, Virginia.
- 2001 January 15, **Charged Hadron Spectra: Preliminary Results from First STAR Au+Au Collisions at RHIC**, Quark Matter '01, 15th International Conference on Ultrarelativistic Nucleus-Nucleus Collisions, Long Island, New York.
- 2001 February 1, **First Results from Charged Hadron Spectra in STAR**, Seminar, Lawrence Berkeley National Laboratory, Berkeley, California.
- 2001 March 27, **Heavy Ions at RHIC: A Tour of the Experiments and Latest Results**, Colloquium, UNAM, Mexico D.F., Mexico.
- 2001 March 28, **The STAR Experiment at RHIC: What Have We Learnt So Far?**, Seminar, Universidad Nacional Autonoma de Mexico (UNAM) and Centro de Investigacion y de Estudios Avanzados (CINVESTAV), Mexico D.F., Mexico.
- 2001 November 1, **Extrapolating from pp to NN Collisions. High p Phenomena at RHIC**, Brookhaven National Laboratory.
- 2002 September 9, **Spectra Physics at RHIC: Highlights from 200 GeV Data**, XXXII International Symposium on Multiparticle Dynamics, Alushta, Ukraine.
- 2002 November 2, **Recent Advances from the STAR Experiment: Inclusive Spectra and Azimuthal Correlations**, X Mexican School of Particles

and Fields, Playa del Carmen, Q. Roo, Mexico.

- 2003 September 7, **Review of Spectra at RHIC**, XXXII International Symposium on Multiparticle Dynamics, Krakow, Poland.
- 2004 June 16, **RHIC Experimental Summary**, Strong and Electroweak Matter '04, Helsinki, Finland.
- 2004 July 22, **Electrons (and Electron Pairs) in STAR**, Hot Quarks '04, Taos, New Mexico.
- 2004 October 22, **Size Matters: Spacetime Geometry in Subatomic Collisions**, SACNAS (Society for the Advancement of Chicanos and Native Americans in Science) National Conference 2004, Austin, TX.
- 2004 November 6, **D Meson Production from d + Au Collisions**, Hard Probes 2004, Ericeira, Portugal.
- 2006 March 11, **Progress on Quarkonium Measurements in STAR**, 22nd Winter Workshop on Nuclear Dynamics, La Jolla, CA.
- 2006 April 21, **Results from Heavy Flavor Production in STAR**, DIS2006 (XIV International Workshop on Deep Inelastic Scattering), Tsukuba, Japan.
- 2006 November 4, **Recent Results from RHIC: Experimental Overview**, SILAFEA 2006 (VI Latin American Symposium on High Energy Physics, Joint with XII Mexican School of Particles and Fields), Puerto Vallarta, Mexico.
- 2006 November 14, **STAR Highlights on High-pT, Heavy Flavor and Electromagnetic Probes**, Quark Matter 2006 (19th International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions), Shanghai, China.
- 2007 February 15, **Upsilon Production in p+p Collisions in STAR**, 23rd Winter Workshop on Nuclear Dynamics, Big Sky, MT .
- 2008 June 27, **Review of Heavy Flavor, High-pT and Electromagnetic Probes**, Characterization of the Quark Gluon Plasma with Heavy Quarks, Bad Honnef Germany.
- 2009 January 23, **Non-Photonic Electrons in STAR: Recent Activity**, Workshop on Heavy Quark Physics in Nucleus-Nucleus Collisions, UCLA, CA.
- 2009 April 22, **Exploring the Forces of Nature**, Visit at Elementary Schools, Detroit Public School System.

- 2009 April 23, **Have We Reached the Bottom at RHIC?**, Colloquium, Wayne State University, Detroit, MI.
- 2009 October, **Have we reached the bottom at RHIC?**, SACNAS National Conference 2009. Scientific Symposium. Dallas, TX.
- 2010 January, **Quarkonia in STAR: Results and Future Plans**, 26th Winter Workshop on Nuclear Dynamics. Ocho Rios, Jamaica.
- 2010 October, **Exploring the Forces of Nature**, B.B. Rice Elementary School. Conroe, TX.
- 2011 July, **Recent Results from STAR**, eXtreMexico: Workshop on eXtreme QCD. San Carlos, Sonora, Mexico.
- 2011 July, **Dimuon results in PbPb and pp collisions in CMS**, Particles And Nuclei International Conference (PANIC) 2011. Cambridge, MA.
- 2012 May, **Overview of Heavy Flavor Results from STAR**, Hard Probes 2012, Plenary Talk. Cagliari, Italy..
- 2012 June, **Heavy Flavor and Heavy Quarkonia in Heavy Ions with CMS**, Workshop on Heavy Flavor Production in High-Energy Nuclear Collisions. Chicago, Il..
- 2012 July, **Results from Relativistic Heavy Ion Collisions**, The LHC, Particle Physics, and the Cosmos. Auckland, NZ..
- 2012 August, **A Panoramic View of Heavy Flavor Results from QM12.**, Jet Modification in the RHIC and LHC Era. Detroit, MI..
- 2013 February, **Quarkonium Results in PbPb Collisions at CMS**, Winter Workshop on Nuclear Dynamics. Squaw Valley, CA.
- 2013 May, **The Quest for Beauty in Heavy Ion Collisions**, Physics Colloquium. UC Riverside. Riverside, CA..
- 2014 September, **A Panorama of Bottomonium Results (with focus on STAR and CMS)**, University of Washington, Institute of Nuclear Theory, Workshop on Heavy Flavor and Electromagnetic Probes in Heavy-Ion Collisions.
- 2014 December, **Weak Boson Results from CMS: Probing the Initial State in Nuclear Collisions Using Electroweak Measurements**, Initial Stages in High-Energy Nuclear Collisions. Napa, CA.
- 2015 January, **Upsilon Results from STAR**, Winter Workshop on Nuclear Dynamics, Keystone, CO.



- 2015 February, **The Strongest Force in Nature, Colorful Gluons, and Beautiful Quarks**, AAAS Conference, Family Science Days..
- 2016 February, **The quest for beauty in heavy-ion collisions.**, Colloquium, University of Frankfurt.
- 2016 March, **Upsilon production in pA and AA collisions from SPS to the LHC**, Workshop on New Observables in Quarkonium Production. Trento, Italy..
- 2017 October, **Suppression of Upsilon excited states in PbPb collisions at  $\sqrt{s}=5.02$  TeV with CMS**, APS Division of Nuclear Physics Meeting. Pittsburgh, PA..
- 2017 November, **Quarkonia measurements in pPb and PbPb collisions at  $\sqrt{s}=5.02$  TeV with CMS**, Workshop on Heavy Flavor Production in High Energy Collisions. Lawrence Berkeley National Lab..
- 2018 May 31, **Overview of Recent Heavy Ion Results from the CMS Experiment**, CIPANP 2018, Palm Springs, CA.
- 2018 August 15, **The quest for beauty in Heavy Ion Collisions**, Colloquium, University of Auckland, Auckland, New Zealand.
- 2019 January 16, **Bottomonia in AA**, Invited Talk, Quarkonia as Tools Workshop, Centre Paul Langevin, Aussois, France.

## Service

### Committees

#### Campus

- 2009 Member - New Faculty Orientation: Discussion Panel of Newly Tenured Faculty.
- 2009 Invited Speaker, Discussion Panel - New Faculty Orientation.
- 2009 Member - UC Davis STEM Preview Day, Faculty Panel.
- 2009 Invited Speaker - Professors for the Future Program.
- 2010 Invited Speaker, Discussion Panel - New Faculty Orientation.
- 2011 Invited Speaker - Visit from O'Dowd High School to UC Davis.
- 2012-13 Member - General Education Committee.
- 2013-14 Ambassador, Speaker - Visit from College of the Canyons to STEM Departments, Organized by through the UCD McNair Scholars Program.
- 2013-15;  
2016-present Member - Strength Through Equity and Diversity (STEAD) Committee, UC Davis, ADVANCE.
- 2014-2015 Member - International Programs Advisory Committee, UC Davis.

### **Systemwide**

2012-14            Reviewer - UC MEXUS Grant and Postdoctoral Fellow review panel.  
2013-15;2016-pre Member - UC MEXUS Advisory Committee.  
sent  
2014-2015        Member - UC-Mexico Initiative, Student Mobility Task Force.

### **Other University**

2011-12           SACNAS - Judging posters, faculty contact, and manning of the UC  
Davis Exhibitor booth in support of the campus's role as Platinum  
Sponsor of SACNAS '11.

### **Other Non-University**

2007            Co-Convenor - STAR Heavy Flavor Physics Working Group (PWG). This  
is an activity to which I devoted the largest fraction of my research time  
and professional service time. For the aspects which pertain to service,  
one major contribution is the supervision of all talks and proceedings  
from the PWG. The published proceedings from analyses done in the  
Heavy Flavor group which I reviewed and approved are listed in the  
Candidate's Statement.

2007            RHIC/AGS Users' Executive Committee (Working Groups: Funding,  
Politics and Programmatic Committee; Quality of Life Committee).

2007            Local Organizing Committee, Colliders to Cosmic Rays.

2007            STAR Talks Committee.

2008            Co-Convenor - STAR Heavy Flavor Physics Working Group (PWG).

2008            RHIC/AGS Users' Executive Committee (Working Groups: Funding,  
Politics and Programmatic Committee; Quality of Life Committee).

2008            SACNAS Committees for 2008 National Conference: Served in abstract  
selection committee; served as judge for posters and presentations.

2008            Local Organizing Committee, DNP 2008.

2008            Local Organizing Committee, Hot Quarks 2008.

2008            Local Organizing Committee, STAR Collaboration Meeting at UC Davis.

2008            STAR Talks Committee.

2009            Co-Convenor - STAR Heavy Flavor Physics Working Group (PWG).

2009            RHIC/AGS Users' Executive Committee (Working Groups: Funding,  
Politics and Programmatic Committee; Quality of Life Committee).

2009            Co-organizer - RHIC & AGS Annual Users' Meeting, Workshop on Heavy  
Flavor Physics.

2009            Local Organizing Committee, Hot Quarks 2010.

2009            SACNAS Committees for 2009 National Conference. Served in abstract  
selection committee; served as judge for posters and presentations.

2009            Participant - 2009 Adopt-a-Physicist Program, Spring.

2009            Participant - 2009 Adopt-a-Physicist Program, Fall.

2010            Reviewer - NSF CAREER Proposal Review Panel.

2010            Physicist "Adoptee" - Adopt-a-Physicist Program.

2011            Local Organizer - STAR Analysis Meeting at UCD.

2011-14        Physicist "Adoptee" - Adopt-A-Physicist Program.

2012-13 DOE Nuclear Physics grant reviewer.

### **Editorial and Advisory Boards**

2008-09 Editor: Hot Quarks Conference Proceedings.  
2009 Referee, Hot Quarks volume of The European Physical Journal (4 publications reviewed).  
2009-10 Editor: Hot Quarks Conference Proceedings.  
2010-11 Editor: Hot Quarks Conference Proceedings.  
2011 Referee: Physical Review C.  
2011-12 Editor: Hot Quarks Conference Proceedings.  
2013-2015 UC MEXUS Advisory Committee.

## **Teaching**

### **Courses**

2004 Fall Semester, Course Number=P202, General Physics (at Indiana University), Undergraduate Count=0, Graduate Count=0, Percentage Effort=100  
2005 Fall Semester, Course Number=P201, General Physics (at Indiana University), Undergraduate Count=0, Graduate Count=0, Percentage Effort=100  
2006 Spring Quarter, Course Number=Phy 7C, General Physics-Lecture, Units=4, Undergraduate Count=266, Graduate Count=0, Percentage Effort=100  
2006 Fall Quarter, Course Number=Phy 7C, General Physics-Lecture, Units=4, Undergraduate Count=150, Graduate Count=0, Percentage Effort=100  
2007 Winter Quarter, Course Number=Phy 7C, General Physics-Discussion/Lab, Units=4, Undergraduate Count=240, Graduate Count=0, Percentage Effort=100  
2007 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=8, Graduate Count=0, Percentage Effort=100  
2007 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=29, Graduate Count=0, Percentage Effort=100  
2007 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=47, Graduate Count=0, Percentage Effort=100  
2008 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=34, Graduate Count=0, Percentage Effort=100  
2008 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=18, Graduate Count=0, Percentage Effort=100

2008 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=41, Graduate Count=0, Percentage Effort=100

2008 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=47, Graduate Count=0, Percentage Effort=100

2009 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=35, Graduate Count=0, Percentage Effort=100

2009 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=13, Graduate Count=0, Percentage Effort=100

2009 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=27, Graduate Count=0, Percentage Effort=100

2009 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=48, Graduate Count=1, Percentage Effort=100

2010 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=36, Graduate Count=3, Percentage Effort=100

2010 Winter Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Undergraduate Count=0, Graduate Count=6, Percentage Effort=100

2010 Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics, Units=4, Undergraduate Count=9, Graduate Count=1, Percentage Effort=100

2010 Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Undergraduate Count=0, Graduate Count=4, Percentage Effort=100

2010 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=41, Graduate Count=0, Percentage Effort=100

2010 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=86, Graduate Count=0, Percentage Effort=100

2011 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=60, Graduate Count=0, Percentage Effort=100

2011 Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics, Units=4, Undergraduate Count=21, Graduate Count=0, Percentage Effort=100

2011 Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Undergraduate Count=0, Graduate Count=11, Percentage Effort=100

2011 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Undergraduate Count=71, Graduate Count=0

2012 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=37, Graduate Count=0, Percentage Effort=100

2012	Spring Quarter, Course Number=224C, Intro Relativistic Heavy Ion Physics, Units=3, Undergraduate Count=3, Graduate Count=8, Percentage Effort=100
2012	Fall Quarter, Course Number=P105A, Analytical Mechanics, Undergraduate Count=80, Graduate Count=0
2013	Winter Quarter, Course Number=252C, Statistical Data Analysis for Particle/Nuclear Physics, Undergraduate Count=0, Graduate Count=5
2013	Spring Quarter, Course Number=9A, Classical Physics, Units=4, Undergraduate Count=160, Graduate Count=0
2013	Fall Quarter, Course Number=9A, Classical Physics, Units=4, Undergraduate Count=163, Graduate Count=0
2014	Winter Quarter, Course Number=252C, Statistical Data Analysis for Particle/Nuclear Physics, Units=3, Undergraduate Count=0, Graduate Count=5
2014	Fall Quarter, Course Number=105A, Analytical Mechanics, Units=4, Undergraduate Count=76, Graduate Count=0
2015	Winter Quarter, Course Number=224C, Intro Relativistic Heavy Ion Physics, Units=3, Undergraduate Count=0, Graduate Count=3
2016	Fall Quarter, Course Number=105A, Analytical Mechanics, Units=4, Undergraduate Count=64, Graduate Count=0
2017	Winter Quarter, Course Number=9HE, Honors Physics, Units=5, Undergraduate Count=24, Graduate Count=0
2017	Spring Quarter, Course Number=9A, Classical Physics, Units=5, Undergraduate Count=123, Graduate Count=0
2017	Fall Quarter, Course Number=105A, Analytical Mechanics, Units=4, Undergraduate Count=72, Graduate Count=0
2017	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=46, Graduate Count=0
2018	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=38, Graduate Count=0
2018	Spring Quarter, Course Number=Phy 224C, Relativistic Heavy Ion Physics, Units=4, Undergraduate Count=0, Graduate Count=7
2018	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=51, Graduate Count=0
2018	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=50, Graduate Count=0

### **Special Advising**

2009	Physics Department Ombudsperson
2010	Physics Department Ombudsperson
2014	Oral Examination Committee member, Dustin Stolp 11/21/14
2015	Oral Examination Committee chair, Kathryn Meehan 5/15/15
2015	Thesis Defense Committee member, Nicolas Filipovic, Ecole Polytechnique, France
2016	Oral Examination Committee chair, Hoi Sing Cheung 11/30/16
2017	Special Advising in Research, Leszek Kosarzewski (Warsaw University of Technology)

## **Thesis Committees**

2006-2011	Orpheus Mall
2006-2012	Cara Henson, Postdoctoral Fellow
2006-2013	Randy Nelson
2007-2011	Rosi Reed, Lehigh University, Assistant Professor
2007-2011	Jorge Robles, R&D, Decision Sciences Corp.
2007-2013	Renjun Xu
2008-2014	Guillermo Breto, Data scientist, Bloomberg
2008-2014	Samantha Brovko, Raytheon, Senior Systems Engineer
2008-2014	Jeremy Mock
2010-2014	Anthony Kesich, Facebook, Software Engineer
2010-2014	Evan Sangaline, Intoli, Startup founder
2010-2014	Michael Gardner, Reddit, Data Scientist
2010-2015	Rylan Conway, Amazon, Alexa AI, Applied Scientist
2011-2017	Christopher Flores, USAA, Data Scientist
2012-2012	Christopher Powell (University of Cape Town)
2012-2017	Chad Flores, Lam Research, Product Engineer
2013-2018	Kathryn Meehan, Lawrence Berkeley Lab, Radiation Detection Postdoc
2015-2019	Santona Tuli
2015	Nicolas Filipovic (Ecole Polytechnique, France)
2015-2019	Ota Kukral
2016-2020	Todd Kinghorn
2016-2020	Samuel Heppelmann
2016-2020	Hoi Sing Cheung
2016-2021	Graham Waegel
2016-2021	Jared Jay
2016-2022	Kathleen Stewart
2016-2022	Benjamin Kimelman
2017-2023	Matthew Harasty
2018	Audrey Franciso (Subatech, France)