CURRICULUM VITAE

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 from p+p collisions, Au+Au collisions and d+Au collisions in STAR, and on dilepton production in Pb+Pb collisions with the CMS experiment at CERN. In both of these, 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.

Education

Education and Training

1997-2001	Yale University, New Haven, CT, Ph.D., High Energy Nuclear Physics (John Harris), Dissertation: Charged Hadron Spectra in Au+Au Collisions at sqrt(s_{NN}) = 130 GeV, nucl-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	Professor, UC Davis Physics. Co-leader of UC Davis Heavy-Ion Group.
7/2008-7/2012	Associate Professor, UC Davis Physics.

1/2006-7/2008	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-convenor, 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) scheme for the first time in the STAR experiment during the 2005 p+p data taking run. Mentor at IU: Steven Vigdor.
9/2003-9/2004	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.

Grants and Contracts

Grants Active

04/01/07 - 03/31/12	Grant #0645773, $900,000, Principal Investigator, CAREER: Studies of Heavy Quarkonium Production in Relativistic Heavy-Ion Collisions at UCD, National Science Foundation
08/01/10 - 12/31/12	Grant #1038404, $5,000, Principal Investigator, Hot Quarks - A Workshop on The Physics of Ultrarelativistic Nucleus-Nucleus Collisions for Young Scientists, National Science Foundation
08/01/11 - 07/31/2014	Grant #1068833, $792,000, Co-Principal Investigator, Quantifying Key Properties of the Quark-Gluon Plasma, Daniel Cebra (Principal Investigator), National Science Foundation
05/01/10 - 04/30/2013	Grant #1004848, $403,755, Co-Principal Investigator, REU Site: UC Davis Physics Department, Rena Zieve (Principal Investigator), National Science Foundation

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	Association of Students of UCD Nominee for Excellence in Education.
2013	UC Davis Distinguished Teaching Award, Undergraduate Teaching.

Selected Publications

1. S. Chatrchyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). Observation of sequential Upsilon suppression in PbPb collisions. Phys.Rev.Lett. 109: 222301, 2012.
2. S. Chatrchyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). Indications of Suppression of Excited Upsilon States in Pb-Pb Collisions at sqrt(s) = 2.76 TeV. Phys Rev Lett, 107: 052302, 2011.
3. S. Chatrchyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). Study of Z Boson Production in PbPb Collisions at sqrt(s)=2.76 TeV. Phys. Rev. Lett., 106.
4. S. Chatrchyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). Suppression of Non-Prompt J/ψ, Prompt J/ψ, and Υ(1S) in PbPb Collisions at sqrt(s_NN) = 2.76 TeV. Journal of High Energy Physics, 05: 063.
5. Abelev, B.I., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). Y Cross Section in p+p Collisions at sqrt(s) = 200 GeV. Physical Review D, 82:012004, 2010.

Talks

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.
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 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**, SILAFAE 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.

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 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..

Teaching

Courses

2004 Fall Semester, Course Number=P202, General Physics (at Indiana University)

2005 Fall Semester, Course Number=P201, General Physics (at Indiana University)

2006 Spring Quarter, Course Number=Phy 7C, General Physics-Lecture, Units=4, Undergraduate Count=266

2006 Fall Quarter, Course Number=Phy 7C, General Physics-Lecture, Units=4, Undergraduate Count=150

2007 Winter Quarter, Course Number=Phy 7C, General Physics-Discussion/Lab, Units=4, Undergraduate Count=240

2007 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=8

2007 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=29

2007 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=47

2008 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=34

2008 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=18

2008 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=41

2008 Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=47

2009 Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=35

2009 Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics, Units=4, Undergraduate Count=13

2009 Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=27

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

2010	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=36, Graduate Count=3
2010	Winter Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Under, Graduate Count=6
2010	Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics, Units=4, Undergraduate Count=9, Graduate Count=1
2010	Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Under, Graduate Count=4
2010	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics, Units=1, Undergraduate Count=41
2010	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Units=4, Undergraduate Count=86
2011	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=60
2011	Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics, Units=4, Undergraduate Count=21
2011	Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar, Units=1, Under, Graduate Count=11
2011	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Undergraduate Count=71
2012	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics, Units=4, Undergraduate Count=37
2012	Spring Quarter, Course Number=224C, Intro Relativistic Heavy Ion Physics, Units=3, Undergraduate Count=3, Graduate Count=8
2012	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics, Undergraduate Count=80

Student Advising

2007 - 2008	Undergraduate advisees: (4), Graduate advisees: (2)
2008 - 2009	Undergraduate advisees: (6), Graduate advisees: (2)
2009 - 2010	Undergraduate advisees: (3), Graduate advisees: (3)
2010 - 2011	Undergraduate advisees: (4), Graduate advisees: (3)
2011 - 2012	Undergraduate advisees: (3), Graduate advisees: (4)

Thesis Committees

2006-2012	Cara Henson, Member, Ph.D., Awarded, Postdoctoral Fellow
2006-2012	Orpheus Mall, Member, Ph.D., In Progress
2006-2012	Randy Nelson, Member, Ph.D., In Progress
2007-2011	Rosi Reed, Chair, Ph.D., Awarded, Postdoctoral Fellow
2007-2011	Jorge Robles, Chair, Ph.D., Awarded, Postdoctoral Fellow
2007-2012	Renjun Xu, Member, Ph.D., In Progress
2008-2013	Guillermo Breto, Chair, Ph.D., In Progress
2008-2013	Samantha Brovko, Co-Chair, Ph.D., In Progress
2008-2013	Jeremy Mock, Member, Ph.D., In Progress
2010-2011	Fiona Ding, Co-Chair, Ph.D., In Progress
2010-2013	Anthony Kesich, Chair, Ph.D., In Progress
2010-2013	Evan Sangaline, Co-Chair, Ph.D., In Progress

2010-2013	Rylan Conway, Co-Chair, Ph.D., In Progress
2010-2013	Michael Gardner, Chair, Ph.D., In Progress
2010-2015	Christopher Flores, Co-Chair, Ph.D., In Progress
2012-2012	Christopher Powell, Member, Ph.D., In Progress

Service

Committees

Systemwide

2012 Reviewer - UC MEXUS Postdoctoral and grant review panel.

Other University

2011 UC Davis Physics REU Program.

2011 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 Programmatics 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 Programmatics 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 Programmatics 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.
2012	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.