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 with the CMS experiment at CERN and with the STAR detector at Brookhaven Lab. In both experiments, one of the key drivers of my research program is the study bottomonium production in heavy-ion collisions, and the modification of the bottomonium meson binding due to color deconfinement in the Quark-Gluon Plasma produced in the collisions. The melting of these bottom-antibottom bound states in the extremely hot environment is one of the most direct signatures of reaching the deconfined phase of Quantum Chromodynamics. 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. They can be used in the study of quenching of jets in Z+jet events to understand how colored quarks lose energy in the Quark-Gluon Plasma.

Physics Education, Outreach, Diversity, and Inclusion

I am interested in making Physics appealing to a broad audience, particularly among Hispanic/Latinx audiences and to increase the participation of women in STEM. This includes mentoring students at UC Davis, at the SACNAS National Conference, and advising student organizations on Diversity and Inclusion at the undergraduate and graduate levels. 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. Through this film, general audiences of all ages are inspired to learn about the science of the Large Hadron Collider, and we can inspire children to consider becoming scientists. I developed a course on Quantum Physics aimed at non-scientists, to fill a curricular need for students to learn about Quantum Physics without the requirement to have an extensive mathematical background. This makes the subject much more approachable and provides students with a better understanding of one of the most important foundations to understand the Universe from the smallest to the largest scales.

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	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-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.

Grants and Contracts

Grants Active

08/15/2022 - 07/31/2025	Grant #2209614, $1,337,529, Co-Principal Investigator, Studies of the Quark Gluon Plasma at STAR and CMS at UC Davis, Daniel Cebra (Principal Investigator), National Science Foundation

Grants Completed

04/15/2013 - 03/31/2017	Grant #1004848, $320,000, Co-Principal Investigator, REU Site: Physics at UC Davis, Rena Zieve (Principal Investigator), National Science Foundation
04/01/2007 - 03/31/2013	Grant #0645773, $900,000, Principal Investigator, CAREER: Studies of Heavy Quarkonium Production in Relativistic Heavy-Ion Collisions at UCD, National Science Foundation
07/01/2013 - 06/30/2014	$1,000, Principal Investigator, UC MEXUS, UC Davis University Outreach and International Programs (UOIP)
08/01/2010 -	Grant #1038404, $5,000, Principal Investigator, Hot Quarks 2010 - A

12/31/2012	Workshop on The Physics of Ultrarelativistic Nucleus-Nucleus Collisions for Young Scientists, National Science Foundation
01/01/2015 - 09/30/2015	Grant #UCD2014G49, $11,456, Co-Principal Investigator, Kinematic Studies of Nuclear Modification Factor in Upsilon Mesons (Chad Flores Fellowship), Chad Flores (Principal Investigator), Chateaubriand Fellowship
10/01/2011 - 09/30/2014	Grant #1068833, $792,000, Co-Principal Investigator, Quantifying Key Properties of the Quark-Gluon Plasma, Daniel Cebra (Principal Investigator), National Science Foundation
05/01/2016 - 04/30/2019	Grant #1560482, $336,207, Co-Principal Investigator, REU Site: Physics Research at UC Davis, Rena Zieve (Principal Investigator), National Science Foundation
07/01/2014 - 05/30/2020	Grant #1322527, $67,841, Co-Principal Investigator, Full-Scale Development: Secrets of the Universe, Mark Kresser (K2 Communications Inc.) (Principal Investigator), K2 Communications (National Science Foundation Pass-Through Entity)
07/15/2014 - 09/30/2018	Grant #1404281, $1,020,000, Co-Principal Investigator, Studies of the Quark-Gluon Plasma with STAR and CMS at UC Davis, Daniel Cebra (Principal Investigator), National Science Foundation
01/01/2019 - 12/31/2020	Grant #MCA No. 00010098/MRI-19-600713, $58,111, Co-Principal Investigator, The Science of Dense Gluon Matter, Daniel Cebra (Principal Investigator), UC Berkeley (UCOP MRPI)
07/01/2018 - 12/31/2022	Grant #1812398, $1,080,000, Co-Principal Investigator, Experimental Studies of the Properties of the QGP and the QCD Phase Diagram, Daniel Cebra (Principal Investigator), National Science Foundation
05/01/2019 - 04/30/2023	Grant #1852581, $413,008, Co-Investigator, REU Site: UC Davis Physics, Rena Zieve (Principal Investigator), National Science Foundation

Aggregated Publication Information

Source: Inspirehep, Author Calderon de la Barca Sanchez, Manuel

Published Journal Papers: 1678. Citations: 122,744. h-index: 152. Citations/paper: 73.1.

Papers with more than 100 citations: 276. (With more than 500 citations: 18)

Selected Publications

Journals

2001 Adler, C., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Multiplicity Distribution and Spectra of Negatively Charged Hadrons in Au+Au Collisions at sqrt(s_NN) = 130 GeV**. Physical Review Letters, 87: 112303.

2002 Adler, C., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Centrality Dependence of High-p_T Hadron Suppression in Au + Au Collisions at sqrt(s_NN) = 130 GeV**. Physical Review Letters, 89: 202301.

2003 Anderson, M., J. Berkovitz, W. Betts, R. Bossingham, F. Bieser, R. Brown, M. Burks, M. Calderón de la Barca Sánchez, D. Cebra, M. Cherney, J. Chrin, W.R. Edwards, V. Ghazikhanian, D. Greiner, M. Gilkes, D. Hardtke, G. Harper, E. Hjort, H. Huang, G. Igo, S. Jacobson, D. Keane, S.R. Klein, G. Koehler, L. Kotchenda, B. Lasiuk, A. Lebedev, J. Lin, M. Lisa, H.S. Matis, J. Nystrand, S. Panitkin, D. Reichold, F. Retiere, I. Sakrejda, K. Schweda, D. Shuman, R. Snellings, N. Stone, B. Stringfellow, J.H. Thomas, T. Trainor, S. Trentalange, R. Wells, C. Whitten, H. Wieman, E. Yamamoto and W. Zhang. **The STAR Time Projection Chamber: A Unique Tool for Studying High Multiplicity Events at RHIC.** Nuclear Instruments and Methods in Physics Research A, 499: 659-678.

2003 Adams, J., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Evidence from d + Au Measurements for Final-State Suppression of High-p_T Hadrons in Au + Au Collisions at RHIC**. Physical Review Letters, 91: 072304.

2003 Ackermann, K.H, M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **STAR Detector Overview**. Nuclear Instruments and Methods in Physics Research A, 499: 624-632.

2005 Adams, J., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Open Charm Yields in d + Au Collisions at sqrt(s_NN) = 200 GeV**. Physical Review Letters, 94: 062301.

2007 Abelev, B.I., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Transverse Momentum and Centrality Dependence of High-p_T Nonphotonic Electron Suppression in Au+Au Collisions at sqrt(s_NN) = 200 GeV**. Physical Review Letters, 98: 192301.

2009 Abelev, B.I., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Measurement of D* Mesons in Jets from p + p Collisions at sqrt(s) = 200 GeV**. Physical Review D, 79: 112006.

2009 Abelev, B.I., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **J/ψ Production at High Transverse Momenta in p + p and Cu + Cu Collisions at sqrt(s_NN) = 200 GeV**. Physical Review C, 80: 041902.

2010 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.

2011 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Study of Z Boson Production in PbPb Collisions at sqrt(s)=2.76 TeV**. Physical Review Letters, 106: 212301.

2011 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Indications of Suppression of Excited Y States in Pb-Pb Collisions at sqrt(sNN) = 2.76 TeV**. Physical Review Letters, 107: 052302.

2011 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Observation and Studies of Jet Quenching in PbPb Collisions at sqrt(s_NN) = 2.76 TeV**. Physical Review C, 84: 024906.

2012 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Suppression of Non-Prompt J/ψ, Prompt J/ψ, and Y(1S) in PbPb Collisions at sqrt(s_NN) = 2.76 TeV**. Journal of High Energy Physics, 05: 063.

2012 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Azimuthal Anisotropy of Charged Particles at High Transverse Momenta in Pb-Pb Collisions at sqrt(s_NN) = 2.76 TeV**. Physical Review Letters, 109: 022301.

2012 S. Chatrchyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Observation of sequential Upsilon suppression in PbPb collisions**. Phys.Rev.Lett., 109(22): 222301.

2013 Chatrchyan, S., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Multiplicity and transverse momentum dependence of two- and four-particle correlations in pPb and PbPb collisions**. Physics Letters B, 724: 213-240.

2014 Adamczyk, L., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Suppression of Upsilon Production in d+Au and Au+Au Collisions at sqrt(s_NN) = 200 GeV**. Physics Letters B, 735: 127.

2015 Khachatryan, V., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Study of Z production in PbPb and pp collisions at sqrt(sNN) = 2.76 TeV in the dimuon and dielectron decay channels**. Journal of High Energy Physics, 1503: 022.

2016 Adamczyk, L., M. Calderón de la Barca Sánchez, et al. (STAR Collaboration). **Upsilon production in U+U collisions at sqrt(sNN)=193 GeV with the STAR experiment**. Physical Review C, 94(6).

2017 Khachatryan, V., M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Suppression of Y(1S),Y(2S) and Y(3S) production in PbPb collisions at sqrt(sNN) = 2.76 TeV**. Physics Letters B, 770: 357-379.

2017 A. M. Sirunyan, M. Calderón de la Barca Sánchez, et al. (CMS Collaboration). **Relative Modification of Prompt ψ(2S) and J/ψ 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 Y States Relative to the Ground State in Pb-Pb Collisions at sqrt(s_NN) = 5.02 TeV**. Physical Review Letters, 120: 142301.

2019 The CMS Collaboration. **Measurement of nuclear modification factors of ϒ(1S), ϒ(2S), and ϒ(3S) mesons in PbPb collisions at sqrt(sNN) = 5.02 TeV**. Physics Letters B, 790: 270-293.

2021 The CMS Collaboration. **Measurement of the azimuthal anisotropy of Upsilon(1) and Upsilon(2) mesons in PbPb collisions at sqrt(sNN) = 5.02** . Phys.Lett.B 819 (2021), 136385.

2022 The CMS Collaboration. **Nuclear modification of Y states in pPb collisions at sqrt(sNN) = 5.02 TeV** . Phys.Lett.B 835 (2022), 137397.

2024 A. Hayrapetyan et al. (CMS Collaboration). **Performance of CMS muon reconstruction from proton-proton to heavy ion collisions**. Journal of Instrumentation, 19: P09012.

PhD Thesis Advisor and co-advisor

2007-2011 Chair, Rosi Reed, Lehigh University, Associate Professor
2007-2011 Chair Jorge Robles, R&D, Decision Sciences Corp.
2008-2014 Chair, Guillermo Breto, Data scientist, Bloomberg
2008-2014 Co-chair, Samantha Brovko, Northrop-Grumman, Senior Systems Engineer
2010-2014 Chair, Anthony Kesich, Recidiviz, Software Engineer
2010-2014 Co-chair, Evan Sangaline, Intoli, Startup founder
2010-2014 Chair, Michael Gardner, Reddit, Data Scientist
2010-2015 Chair, Rylan Conway, Meta, Staff Research Scientist
2011-2017 Co-chair, Christopher Flores, USAA, Data Scientist
2012-2017 Chair, Chad Flores, Lam Research, Product Engineer
2012-2022 Co-chair, Kathryn Carson Meehan, First American Financial Corp, Data Scientist
2015-2019 Chair, Santona Tuli, Upsolver, Head/Director of Data
2015-2023 Chair, Ota Kukral
2016-2020 Co-chair, Todd Kinghorn, Sierra College, Faculty
2016-2020 Co-chair, Samuel Heppelmann, Lawrence Livermore Natl Lab, Research Scientist
2016-2021 Chair, Jared Jay, Gastrograph AI, Data Scientists
2016-2022 Co-chair, Benjamin Kimelman, Postdoctoral Scholar, Vanderbildt University
2016-2023 Chair, Graham Waegel
2017-2025 Co-chair, Matthew Harasty
2019-2025 Chair, Saeahram Yoo
2019-2025 Co-chair, Zachary Sweger
2020-2026 Chair, Francisco Gonzalez
2022-2027 Co-chair, Mathias Labonte
2023-2028 Co-chair, Ziyuan Zheng
2023-2028 Co-chair, Andrew Liggett

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. Subatomic mythbusters: Confirmed, Website, April 8, 2011, Fermilab Today.

4. Heaviest antimatter found, Newspaper Article, April 27, 2011, UC Davis News.
5. Bringing nuclei together breaks quarks apart, Website, July 28, 2011, APS Physics.
6. Secrets of the Universe, Other, 2013-present, NSF, K2 Communications, Giant Screen Film.
7. Secrets of the Universe Trailer, Video, 2019.
8. Explore Secrets of the Universe in Spectacular IMAX Movie, Magazine Article, July 2019, UC Davis News.
9. Explore Secrets of the Universe, Newspaper Article, 2019, UC Davis College of Letters and Science.
10. Students at UC Davis Know the Strong Force, Video, 2019, UC Davis News and Media.
11. Unsolved Mysteries, Magazine Article, 2019/2020, UC Davis Magazine.
12. Secrets of the Universe at L'Hemisferic, Award Winning Film, Magazine Article, May 2021, 24/7 Valencia.
13. 'Secrets of the Universe': A webcast with Manuel Calderon de la Barca Sanchez, Video, November 2021, Perimeter Institue of Theoretical Physics.
14. UC Davis Scientist Stars in New Movie Examining Origins of the Universe, Television Interview, May 2022, CBS News Sacramento.
15. 'Secrets' in the Multiverse, Newspaper Article, May 2022, UC Davis News.

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.

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 predicted by the Brout-Englert-Higgs mechanism”.
2013-14	SACNAS UC Davis Chapter Award for "Commitment to Students"
2015	"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.

Editions of Conference Proceedings

2009	Edited by S. Bass, H. Caines, M. Calderon de la Barca Sanchez, A. de Falco, C. Kuhn, J. Nagle, M. Nardi, C. Salgado and J. Velkovska.: **Hot Quarks 2008**, Vol. 62(1), The European Physical Journal C.
2011	Edited by Markus Bleicher, Helen Caines, Manuel Calderon de la Barca Sanchez, Alessandro de Falco, Rainer Fries, Raphael Granier de Cassagnac, Boris Hippolyte, Andre Mischke, Marzia Nardi, Carlos A Salgado.: **Hot Quarks 2010**, Vol. 270(1), Journal of Physics: Conference Series.

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: Prerliminary 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**, 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.

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 Nucleaus-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.

2019 July, **Global Premiere 'Secrets of the Universe', Screening and Q&A**, Smithsonian National Air and Space Museum, Washington, DC.

2019 October, **Screening and Q&A 'Secrets of the Universe'**, SACNAS National Conference.

2020 January, **Screening and Q&A, 'Secrets of the Universe'**, Invited Screening and Q&A, New Mexico State University.

2020 February, **'Secrets of the Universe' Screening and Q&A**, AAAS Meeting / Pacific Science Center IMAX, Seattle, WA.

2020 May, **Quarkonia in Heavy Ion Collisions**, Invited Talk, Hard Probes 2020 (Virtual Meeting).

2020 July, **'Secrets of the Universe' : Exploring the science of the largest collider on earth**, Webinar, Pacific Science Center, Seattle, WA.

2020 August, **'Secrets of the Universe': Exploring the science of the largest collider on earth**, Webinar, Armagh Observatory and Planetarium, Armagh, Ireland.

2020 August, **'Secrets of the Universe': Exploring the science of the largest collider on earth**, Webinar, California Academy of Sciences, San Francisco, CA.

2020 August, **'Secrets of the Universe': Exploring the science of the largest collider on earth**, Webinar, Jordan Planetarium, University of Maine.

2020 September, **'Secrets of the Universe': Exploring the science of the largest collider on earth**, Webinar, The Tech Interactive, San Jose, CA.

2021 September, **'Secrets of the Universe' Screening and Poster Signing/Meet & Greet**, Launch Event, California Science Center, Los Angeles, CA.

2021 November, **'Secrets of the Universe', Screening and Q&A**, Invited screening, City of Arts and Sciences, Valencia, Spain.

2021 November, **'Secrets of the Universe', Screening and Q&A**, Invited Screening, Copenhagen Planetarium, Denmark.

2021 November, **'Secrets of the Universe': Exploring the science of the largest collider on earth**, Webinar, Perimeter Institute of Theoretical Physics, Waterloo, Ontario, Canada.

2022 May, **'Secrets of the Universe': Screening and Q&A**, SMUD Museum of Science and Curiosity, UC Davis Chancellor's Screening.

2022 May, **'Secrets of the Universe' Screening and Q&A**, SMUD Museum of Science and Curiosity, VIP/Member Screening.

2022 May, **The strongest force in nature: How I got to cook the primordial soup**, Keynote Talk, Cesar Chavez Youth Leadership Conference, UC Davis.

2022 June, **Pion, Kaon, and Proton Spectra in Small Systems, a Review**, Thesis Defense of Omar Vasquez, Invited to serve as the Opponent, University of Lund, Sweden.

2022 June, **Beautiful Melting: The suppression of Upsilon states in heavy-ion collisions**, Invited Seminar, Niels Bohr Institute, Copenhagen, Denmark.

2022 June, **Niels Bohr's Legacy**, Invited Public Talk, after a screening of 'Secrets of the Universe' to commemorate the 100 anniversary of Niels Bohr's Nobel Prize, Copenhagen Planetarium, Denmark.

2022 October, **'Secrets of the Universe' Screening, Q&A, and Dinner**, SMUD Museum of Science and Curiosity, UC Davis Chancellor's Board of Advisors Dinner.

2023 July, **'Secrets of the Universe' Screening, Q&A, and Dinner**, CECUT, Tijuana, Mexico.

2023 September, **'Secrets of the Universe' Monterrey Premiere, Screening, Q&A, and Dinner**, Papalote Museo del Niño, Monterrey, Mexico.

2024 May, **Commencement Keynote Speaker**, Prepa Tec, Monterrey, Mexico.

2025 January, **'Secrets of the Universe' Screening, Q&A, and Dinner**, Texas A&M Corpus Christi.

Broadcast - TV, Radio, Film, Internet Completed

06/01/2019 'Secrets of the Universe' is an IMAX/Giant-Screen film about the Physics of the Quark-Gluon Plasma at the Large Hadron Collider. I am the featured scientist in the film, its narrator, and scientific advisor. The film is reaching general audiences in the US, Spain, Denmark, Mexico, Hong Kong, and has won numerous awards for scientific documentary filmmaking.
View Event Information

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
2006	Fall Quarter, Course Number=Phy 7C, General Physics-Lecture
2007	Winter Quarter, Course Number=Phy 7C, General Physics-Discussion/Lab
2007	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics,
2007	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2007	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics
2008	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics
2008	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2008	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2008	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics
2009	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics
2009	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2009	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2009	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics
2010	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics
2010	Winter Quarter, Course Number=Phy 291, Nuclear Physics Seminar
2010	Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics
2010	Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar
2010	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2010	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics
2011	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics
2011	Spring Quarter, Course Number=Phy 129A, Intro Nuclear Physics
2011	Spring Quarter, Course Number=Phy 291, Nuclear Physics Seminar
2011	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics71
2012	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics
2012	Spring Quarter, Course Number=224C, Intro Relativistic Heavy Ion Physics
2012	Fall Quarter, Course Number=P105A, Analytical Mechanics
2013	Winter Quarter, Course Number=252C, Statistical Data Analysis for Particle/Nuclear Physics
2013	Spring Quarter, Course Number=9A, Classical Physics,
2013	Fall Quarter, Course Number=9A, Classical Physics
2014	Winter Quarter, Course Number=252C, Statistical Data Analysis for Particle/Nuclear Physics,
2014	Fall Quarter, Course Number=105A, Analytical Mechanics,

2015	Winter Quarter, Course Number=224C, Intro Relativistic Heavy Ion Physics,
2016	Fall Quarter, Course Number=105A, Analytical Mechanics,
2017	Winter Quarter, Course Number=9HE, Honors Physics,
2017	Spring Quarter, Course Number=9A, Classical Physics
2017	Fall Quarter, Course Number=105A, Analytical Mechanics,
2017	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics,
2018	Winter Quarter, Course Number=Phy 105B, Analytical Mechanics,
2018	Spring Quarter, Course Number=Phy 224C, Relativistic Heavy Ion Physics
2018	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics,
2018	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics,
2019	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics,
2019	Fall Quarter, Course Number=Phy 105A, Analytical Mechanics,
2019	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2020	Winter Quarter, Course Number=Phy 224C, Introduction to Relativistic Heavy Ion Physics,
2020	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2020	Fall Quarter, Course Number=Phy 9A, Classical Physics
2020	Fall Quarter, Course Number=Phy 102, Computational Lab in Physics
2021	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2021	Fall Quarter, Computational Lab in Physics
2022	Winter Quarter, Course Number=Phy 10, Quantum Physics for Everyone
2022	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2023	Winter Quarter, Course Number=Phy 10, Quantum Physics for Everyone
2023	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2024	Winter Quarter, Course Number=Phy 10, Quantum Physics for Everyone
2024	Spring Quarter, Course Number=Phy 129A, Introduction to Nuclear Physics
2024	Spring Quarter, Course Number=Phy 224B, Introduction to Relativistic Heavy Ion Physics,
2025	Winter Quarter, Course Number=Phy 10, Quantum Physics for Everyone,

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;2016-22	Member - Strength Through Equity and Diversity (STEAD) Committee, UC Davis, ADVANCE.
2014-15	Member - International Programs Advisory Committee, UC Davis.
2021-22	Co-Chair - Strength Through Equity and Diversity (STEAD) Committee, UC Davis.

University of California Systemwide

2012-14	Reviewer - UC MEXUS Grant and Postdoctoral Fellow review panel.
2013-15;2016-22	Member - UC MEXUS Advisory Committee.
2014-15	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	Local Organizing Committee, Colliders to Cosmic Rays.
2007/2009	Co-Convenor - STAR Heavy Flavor Physics Working Group (PWG). This activity included major contributions for supervision of all analyses, talks, and publications from the PWG.
2007; 2008	STAR Talks Committee.
2007; 2008; 2009	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.
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 and Fall.
2010	Reviewer - NSF CAREER Proposal Review Panel.
2010-14	Physicist "Adoptee" - Adopt-A-Physicist Program.
2011	Local Organizer - STAR Analysis Meeting at UCD.

2012-13 DOE Nuclear Physics grant reviewer.

2024-Present Member - Nuclear Science Advisory Committee: An advisory committee that provides official advice to the Department of Energy (DOE) and the National Science Foundation (NSF) on the United States national program for basic nuclear science research.

Editorial and Advisory Boards

2013-2015 UC MEXUS Advisory Committee
https://ucmexus.ucr.edu/about/advcomm.html.

Service: Additional Information

Editor

2008-12: Editor, Hot Quarks Conference Proceedings

Referee List

2009: Referee, Hot Quarks volume of The European Physical Journal (4 publications reviewed)

2011: Referee, Physical Review C

Outreach: Screening of Secrets of the Universe

Outreach related to Secrets of the Universe

- Global Premiere at Smithsonian National Air and Space Museum 2019
- Screening at SACNAS National Conference, 2019
- Screening at Pacific Science Center, Seattle 2019
- Screening at New Mexico State University, invited by NMSU SACNAS Chapter 2020
- Screening at Science Olympiad, UC Davis 2020
- Webinar with Pacific Science Center, 2020
- Webinar with Armagh Planetarium, Ireland, 2020
- Webinar with California Academy of Sciences, 2020
- Webinar with The Tech, San Jose, CA, 2020
- Webinar with Telus, Edmonton, Canada, 2020
- Screening at California ScienCenter, 2021
- Screening at L'Hemisferic, Valencia, Spain, 2021
- Screening at Copenhagen Planetarium, Denmark, 2021
- Screenings at SMUD Museum of Science and Curiosity, May 2022
- Screening at Copenhagen Planetarium, Denmark, 2022

- Screening in CECUT, Tijuana, Mexico, 2023
- Screening in Papalote Museo del Niño, Monterrey, Mexico, 2023
- Screening in Papalote Museo del Niño, Monterrey, Mexico, 2024
- Screening in Texas A&M Corpus Christi, Texas, 2025