

Darin E. Acosta

Department of Physics
University of Florida
P.O. Box 118440
Gainesville, FL 32611-8440

Phone: (352) 846-3144
Fax: (352) 392-8863
E-mail: acosta AT phys.ufl.edu
www.phys.ufl.edu/~acosta

Education:

- 1993, Ph.D., High-Energy Physics, University of California, San Diego
Thesis: “Investigations into Scintillating Fiber Calorimetry and a Measurement of the Two-Photon Production of Charged Meson Pairs.” *Graduate advisor:* H.P.Paar
- 1989, M.S., Physics, University of California, San Diego
- 1987, B.S., Physics, California Institute of Technology, Pasadena

Academic Positions:

- 2007–present: Professor, Department of Physics, University of Florida
- 2003–2007: Associate Professor, Department of Physics, University of Florida
- 1997–2003: Assistant Professor, Department of Physics, University of Florida
- 1993–1997: Research Associate, Department of Physics, The Ohio State University, Columbus. *Postdoctoral advisors:* T.Y. Ling, L.S. Durkin
- 1988–1993: Research Assistant, Department of Physics, University of California, San Diego. *Graduate advisor:* H.P.Paar

Awards:

- 2001, Outstanding Junior Investigator, Department of Energy

Research Accomplishments:

- Principal investigator for the development of the “Track-Finder” for the Level-1 Trigger of the Endcap Muon system of the CMS experiment (1998–present). A \$1M project within the US-CMS construction project for the Large Hadron Collider. Electronics production completed in 2005 and currently commissioning the system for CMS experiment data-taking operations.
- Deputy Coordinator of Commissioning and Run Coordination, CMS Collaboration (2007–present). Objectives include setting up the organization, objectives, and detailed planning to bring the CMS experiment into operation for physics studies. Responsibilities also include coordination of the Detector Performance Groups of CMS, which are responsible for the procedures and software to deliver the design performance of the detectors. Member of the CMS management board.
- Co-coordinator of the Physics Reconstruction and Selection groups of CMS and member of the management board of the CMS Software, Computing, and Physics projects (2005–2006). Coordinate detector performance and physics studies, conduct approvals of CMS physics studies for publication. Editor of Volume 1 of

the CMS Physics Technical Design Report. Coordinator of the CMS combined Computing, Software, and Analysis challenge of 2006.

- Co-coordinator of the Muon Physics Reconstruction and Selection group of CMS (2001–2004). Responsible for organizing the detector simulation, muon reconstruction, online trigger strategies, and offline analyses in preparation for physics with muons at the LHC.
- Leader of two beam tests of cathode strip chambers at CERN (2003, 2004). Demonstrated synchronous operation of the trigger electronics system, validation of CMS production electronics.
- Searches for Supersymmetry and Leptoquarks using the CDF2 detector at the Tevatron collider, including development of b-tagging algorithm using the silicon vertex detector.
- Development of electronics for the CDF Level-1 trigger (minbias, TOF) and luminosity monitor.
- Co-coordinator of the High Q^2 and Exotic physics analysis group of the ZEUS experiment at the HERA electron-proton collider (1997–1998).
- Searches for excited fermions, leptoquarks, and tests of the Standard Model (deep-inelastic scattering) at the ZEUS experiment.
- Leader of a beam test at Brookhaven National Lab to test a prototype shower maximum detector for the ZEUS calorimeter (1994).
- Measurement of the production cross section of charged meson pairs at large invariant masses as an exclusive test of QCD using the CLEO II detector at the Cornell Electron Storage Ring.
- Contributed to the development of a prototype lead and scintillating optical fiber calorimeter for use at future high energy accelerators with the SPACAL collaboration (1988–1991).

Teaching:

Courses taught at the University of Florida:

- Physics 2 with calculus (~450 students per semester)
- Physics 2 (honors) with calculus (~15 students per semester)
- Advanced Modern Physics Laboratory 2 (~10 students per semester)
- Introduction to Modern Physics (~40 students per semester)

Career average student evaluation: 4.3/5.0

Service:

Professional:

- Co-organizer of the Phenomenology session for the 15th International Conference on Supersymmetry and the Unification of Fundamental Interactions (SUSY07), Karlsruhe, Germany, July 26 - August 1, 2007
- Co-organizer of the session “First Measurements at the LHC” for the Hadron Collider Physics conference held May 2007 in Isola d'Elba, Italy
- Referee for Physics Letters B, Journal of Physics G (2006, 2007, 2009)
- Advisory Committee of CERN Users, non-member states representative (2006–present)

- Institutional Advisory Board of the US-CMS Collaboration, ex-officio (2007–present)
- Advisory Board of the US-CMS Collaboration, institutional representative for the Trigger and Data Acquisition subproject (1999–2004, 2006)
- Advisory board of the Fermilab LHC Physics Center (2004–2006)
- Member of panel review committee for the Outstanding Junior Investigator award program of the Department of Energy base program (2007)
- Reviewer of high-energy research grants submitted to the Department of Energy base program
- Reviewer of high-energy research grants submitted to the National Science Foundation
- Member of committee to evaluate NSF-funded Tier-2 Computing Centers for US-CMS (2004)
- Chair of review committee on the Central Track Trigger upgrade of the D0 experiment (2004)
- Organizer of Joint CDF/D0/CMS Workshop on Physics with Muons at Hadron Colliders, Fermilab, (2004)
- Scientific Secretary for the conference “Higgs and Supersymmetry: Search and Discovery,” March 8–11, 1999, Gainesville, Florida.

Departmental:

- Chair of High Energy Experiment search committee (2007)
- Undergraduate physics majors advisor (2001–present)
- Department Advisory Committee (2004–2006, 2007–present)
- Department Salary Review Committee (2003–2006)
- Society of Physics Students faculty advisor (2000–2003)
- Graduate Recruitment Committee (2001–2003)

Outreach:

- Mentor for the NSF Research Experience for Undergraduates program at the University of Florida, 9 students, (1999–2004)
- Mentor for the NSF QuarkNet program (2000, 2001)
- Physics and science demonstrations to elementary and middle school students within the Alachua County school district

Advisees:

- Anna Kropivnitskaya (postdoctoral associate, 2009–present)
- Gian Piero Di Giovanni (postdoctoral associate, 2008–present)
- Dayong Wang (postdoctoral associate, 2006–2009)
- Daniel Holmes (postdoctoral associate, 2005–2008)
- Song Ming Wang (postdoctoral associate, 1998–2006)
- Joseph Gartner (Ph.D. anticipated 2011)
- Khristian Kotov (Ph.D. anticipated 2010)

- Bobby Scurlock (Ph.D. 2006), *Thesis*: “Compact Muon Solenoid Discovery Potential for the Minimal Supergravity Model of Supersymmetry in Single Muon Events with Jets and Large Missing Transverse Energy in Proton-Proton Collisions at Center-of-Mass energy 14 TeV”
- Dmitri Tsybychev (Ph.D. 2004), *Thesis*: “Search for First-Generation Leptoquarks in the Jets and Missing Transverse Energy Topology in Proton-Antiproton Collisions at Center-of-Mass Energy 1.96 TeV”
- Various undergraduate physics major participating in my research program, recently: B.Jackson (2006-2008), L.Gray (2003-2007).

Selected Publications:

(Over 235 articles in refereed journals such as *Physical Review Letters*, *Physical Review D*, *Physics Letters*, and *Nuclear Instruments and Methods* as a current member of the CMS Collaboration and a former member of the CDF, aZEUS, CLEO and SPACAL Collaborations)

- G.L. Bayatian et al. (CMS Collaboration), “CMS Physics Technical Design Report, Volume 2: Physics Performance,” *Journal of Physics* **G34** (2007) 995-1579.
- G.L. Bayatian et al. (CMS Collaboration), “CMS Physics Technical Design Report, Volume 1: Detector Performance and Software,” CERN/LHCC 2006-001 (2006)
- D. Acosta et al. (CDF Collaboration), “Search for Scalar Leptoquark Pairs Decaying to $\nu\nu qq$ in pp Collisions at $\sqrt{s}=1.96$ TeV,” *Physical Review* **D71** (2005) 112001.
- D. Acosta et al., “Development and Test of a Prototype Regional Track-Finder for the Level-1 Trigger of the Cathode Strip Chamber Muon System of CMS,” *Nuclear Instruments and Methods* **A496** (2003) 64.
- D.E. Acosta and S.K. Blessing, “Leptoquark Searches at HERA and the Tevatron,” *Annual Reviews of Nuclear and Particle Science* **49** (1999) 389.
- J. Breitweg et al. (ZEUS Collaboration), “Comparison of ZEUS Data with Standard Model Predictions for $e^+ p \rightarrow e^+ X$ Scattering at High x and Q^2 ,” *Zeitschrift fur Physik* **C74** (1997) 207.

Recent Conference Presentations, Colloquia, and Seminars:

- “First Glimpse of LHC Data with the CMS Experiment”, colloquium, Brown University, Providence, RI, November 3, 2008
- “Status and Prospects of the CMS Experiment at the LHC”, invited talk at the Meeting of the Southeast Section of the American Physical Society, Raleigh, North Carolina, October 30, 2008
- “LHC First Beams and the Achievements and Prospects of the CMS Experiment”, colloquium, University of Florida, October 2, 2008
- “Status of CMS Commissioning”, International Workshop on Top Quark Physics (TOP2008), Isola d’Elba, Italy, May 19, 2008
- “CMS Commissioning”, seminar, University of Florida, January 10, 2008

- “Preparing CMS for First Physics at the Large Hadron Collider”, University of California, Los Angeles, October 17, 2007
- “CMS Commissioning”, Fermilab Wine & Cheese seminar, October 12, 2007
- “Preparing for the LHC: Physics Commissioning”, (4 lectures), Second CERN-Fermilab Hadron Collider Physics Summer School, CERN, Geneva, Switzerland, June 6-15, 2007
- “CMS Trigger Hardware Developments – Muon Trigger”, Common ATLAS CMS Electronics Workshop for SLHC, CERN, March 20, 2007
- “The Large Hadron Collider”, colloquium, University of Florida, September 28, 2006
- “SUSY Physics at the LHC,” Hadron Collider Physics Symposium 2006, Durham, North Carolina, May, 2006
- “The Promise of the LHC,” Southeast APS Conference, Gainesville, Florida, November, 2005
- “Preparations for Physics at the Large Hadron Collider using the CMS Detector,” Colloquium, Illinois Institute of Technology, October 2004
- “The Hunt for Fundamental Scalar Particles at Proton Colliders,” Colloquium, University of California, Davis, March, 2004
- “The Challenge of Extracting New Physics from the Data-Rich Environment of the LHC,” University of California, Davis, March, 2004
- “SLHC Design Considerations for the CSC Track-Finder and an Asynchronous Trigger Proposal,” Workshop on the Super-LHC, University of Wisconsin, February, 2004
- “The Hunt for Fundamental Scalar Particles at Proton Colliders,” University of Wisconsin, February, 2004
- “Detecting Massive Scalar Particles with Massive Detectors,” Florida Institute of Technology, Sigma Pi Sigma, April 2003
- “What the LHC Can Teach Us About Low Energy Supersymmetry,” Aspen Winter Conference on Particle Physics, Aspen, Colorado, January 2003
- “Supersymmetry at the LHC: Searches, Discovery Windows, and Expected Signatures,” Hadron Collider Physics Conference 2002, Karlsruhe, Germany, October 2002