

Cibrán Santamarina Ríos

AREA OF INTEREST: Particle Physics

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Experience

December 2011–Present: Universidade de Santiago de Compostela, Santiago de Compostela, Spain.

Profesor Contratado Doutor, LHCb Experiment at CERN

- Search of new physics in the analysis of B^0 and B_s hadronic decays.
- Postdoc, PhD, MSc and BSc students supervision.
- Teaching Master of Science and Bachelor of Science Physics degrees.
- Referee for the publications committee of the LHCb experiment.

July 2011–December 2011: Universidade de Santiago de Compostela, Santiago de Compostela, Spain.

Isidro Parga Pondal Fellow, LHCb Experiment at CERN

- Search of new physics in the analysis of B_s hadronic decays.
- PhD students supervision.
- Teaching Master of Science and Bachelor of Science Physics degrees.

January 2011–July 2011: Universidade de Santiago de Compostela, Santiago de Compostela, Spain.

Centro Nacional de Física de Partículas, Astropartículas y Nuclear (CPAN) Post-doctoral Researcher, LHCb Experiment at CERN

- Search of new physics in the analysis of B_s hadronic decays.

October 2010–January 2011: Safe Engineering Services & Technologies, Laval, QC, Canada.

Research Scientist

- Development of an algorithm to segment two conducting lines according to their mutual inductance.
- Implementation of a technique to minimize the surface surrounding a sub-station grounding system.

June 2006–June 2010: McGill University, Montreal, QC, Canada.

Research Associate, Physics Department, ATLAS Experiment at CERN.

- Standard Model Higgs studies, in particular on the possibility of detecting the $H \rightarrow b\bar{b}$ decay at the LHC.
- Potential of the $Z + \text{jet} \rightarrow \nu\nu$ decay for calibrating the missing transverse energy.
- Author and responsible of the jet third level trigger in the experiment.
- Editor of two trigger sections of the CSC book.
- Proposer of improving methods for the first and second level jet triggers.
- Supervision of summer and undergraduate students.
- Referee for the publications committee of the ATLAS experiment.
- On-call responsible for the jet trigger system and data-taking shifter.

March 2004–May 2006: European Laboratory for Particle Physics (CERN), Geneva, Switzerland.

Research Fellow, Physics Division. Trigger Group. ATLAS Experiment at CERN.

- Responsible of the third level trigger selection of high transverse momentum electrons and photons.
- Author and responsible of the calorimeter algorithms of the third level trigger.
- Optimization for the selection of isolated electrons to detect the Higgs decay channel $H \rightarrow ZZ \rightarrow 4e$.
- Research Trainer at the Universidad Nacional de La Plata (Argentina).
- Coordinator of the integration, development and performance studies of the Global Monitoring System in the 2004 combined test beam.
- Supervision of summer students.
- Team member of the 2004 test beam Trigger and Data Acquisition system.

September 2001–March 2004: Universität Basel, Basel, Switzerland.

Research Associate, Institut für Physik. DIRAC Experiment at CERN.

- Study of the effect of the accidental degeneration of hydrogen-like atoms in the probability of transition between two discrete states.
- Proposer of the use of a multi-layer target in the determination of systematic errors of the experiment.
- Determination of the proportionality between the background and the pionic atoms yield.
- Description of the $\pi^+\pi^-$ background using two targets. Analysis of the multiple scattering effects.
- Co-author of the proposal for the DIRAC extension to measure the πK atom lifetime. Approved by CERN.
- Major contributor to the lifetime measurement of ponium lifetime.
- Co-supervisor of PhD students.

October 1995–December 2000: Universidade de Santiago de Compostela, Spain.

Pre-doctoral Fellow, Particle Physics Department. DIRAC Experiment at CERN.

- Author of the Monte Carlo physics generator of the DIRAC experiment.
- Instrumentation work in the Vertical Hodoscopes and the Microstrip Gas Chambers subdetectors.
- Author of the High Voltage slow control of the hodoscopes in the experiment.
- Analysis of the performance of the trigger in the experiment.
- Teaching Assistance.

October 1994–June 1995: Universidade de Santiago de Compostela, Spain.

Undergraduate Research Fellow, Applied Physics Department.

- Research on GRIN wave light guides.
- Teaching Assistance.

Education

October 1997–April 2001: Universidade de Santiago de Compostela, Spain.

Doctorate Cum Laude in Particle Physics entitled: "Detection and Lifetime Measurement of ponium in the DIRAC Experiment"

October 1995–September 1997: Universidade de Santiago de Compostela, Spain.

Master in Particle Physics with Honor Mention entitled: "The Physics of Pionic Atoms".

October 1990–June 1995: Universidade de Santiago de Compostela, Spain.

Bachelor of Science in Physics, Specialized in Fundamental Physics (Atomic, Nuclear, Particles, Solid State, etc.).

Awards

- "Welcome 2 Marie Curie Senior Fellow" FCT (Portugal) & European Union. August 2011 (declined).
- "Isidro Parga Pondal" contract, Xunta de Galicia (Spain). July 2011.
- Centro Nacional de Física de Partículas, Astropartículas y Nuclear (CPAN) "Post-doctoral Researcher Fellowship". December 2010.
- "Isidro Parga Pondal" contract, Xunta de Galicia (Spain). December 2007 (declined).

- *HELEN* grant of the European Union for a stay as Research Trainer at the Universidad Nacional de La Plata (Argentina). April 2006.
- “*Research Fellow*”, European Laboratory for Particle Physics (CERN), Geneva, (Switzerland). May 2003.
- European PhD. University of Santiago de Compostela (Spain). April 2001.
- Honor Mention for the Master Thesis July 1997.
- Pre-doctoral Fellow of “*Formación de Profesorado Universitario*” (FPU). Ministry of Education and Science (Spain). October 1996.
- Pre-doctoral Fellow of “*Terceiro Ciclo*”. Xunta de Galicia (Spain). December 1995.
- Undergraduate Research Fellow (“*Colaboración*”), Ministry of Education and Science (Spain). June 1994.

Other Merits

- Participant of eleven international research projects.
- Referee for the publication committee of the ATLAS experiment. Since December 2009.
- Invited researcher *Laboratorio de Instrumentação e Física Experimental e de Partículas* (LIP), Lisbon, Portugal, Joint Institute of Nuclear Research (JINR), Dubna, Russia and Universidad Nacional de La Plata, La Plata, Argentina.

Languages

- Galician and Spanish: native. English, French and Portuguese: excellent.

Selected Publications

This a selection of most relevant and major involvement publications. For a more exhaustive list the next link can be consulted:

[http://inspirehep.net/search?ln=en&ln=en&p=FIND+EA+"SANTAMARINA+RIOS,+C"+OR+EA+"SANTAMARINA+RIOS,+CIBRAN"+OR+EA+"SANTAMARINA,+C"+OR+EA+"SANTAMARINA,+CIBRAN"+OR+EA+"RIOS,+C+SANTAMARINA"+OR+EA+"RIOS,+CIBRAN+SANTAMARINA"&ah](http://inspirehep.net/search?ln=en&ln=en&p=FIND+EA+)

resulting in 413 published paper and an h_{HEP} index of 68. A search in the Web of Science gives an h index of 35.

- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC*. Phys. Lett. B **716** (2012) 1.
2213 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *The ATLAS Experiment at the CERN Large Hadron Collider*. JINST **3** (2008) S08003.
2190 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *The ATLAS Simulation Infrastructure*. Eur. Phys. J. C **70** (2010) 823.
679 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Combined search for the Standard Model Higgs boson using up to 4.9 fb^{-1} of pp collision data at $\sqrt{s}=7 \text{ TeV}$ with the ATLAS detector at the LHC*. Phys. Lett. B **710** (2012) 49.
467 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS detector in $\sqrt{s}=7 \text{ TeV}$ proton-proton collisions*. Phys. Lett. B **710** (2012) 67
292 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Observation of a Centrality-Dependent Dijet Asymmetry in Lead-Lead Collisions at $\sqrt{s_{NN}}=2.77 \text{ TeV}$ with the ATLAS Detector at the LHC*. Phys. Rev. Lett. **105** (2010) 252303
291 citations counted in INSPIRE as of 14 Feb 2014

- C. Santamarina, R. Aaij et al. [LHCb collaboration]. *First Evidence for the Decay $B_s \rightarrow \mu^+ \mu^-$* . Phys. Rev. Lett. **110** (2013) 021801
227 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, R. Aaij et al. [LHCb collaboration]. *Evidence for CP violation in time-integrated $D^0 \rightarrow h^+ h^-$ decay rates*. Phys. Rev. Lett. **108** (2012) 111602
206 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Measurement of the $W \rightarrow l\nu$ and $Z\gamma^* \rightarrow ll$ production cross sections in proton-proton collisions at $\sqrt{s}=7$ TeV with the ATLAS detector*. JHEP **1012** (2010) 060
255 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, G. Aad et al. [ATLAS collaboration]. *Measurement of the top quark-pair production cross section with ATLAS in pp collisions at $\sqrt{s}=7$ TeV*. Eur. Phys. J. C **71** (2011) 1577
246 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, R. Aaij et al. [LHCb collaboration]. *First observation of the decay $B_s^0 \rightarrow K_0^* K_0^*$* . Phys. Lett. B **709** (2012) 50
22 citations counted in INSPIRE as of 14 Feb 2014
- C. Santamarina, R. Aaij et al. [LHCb collaboration]. *First observation of the decay $B_s^0 \rightarrow \phi K_0^*$* . JHEP **1311** (2013) 092
- DM Asner, S Dejong, M Cunningham, K Randriarivony, C Santamarina and M Schram. *Prospects for observing the standard model Higgs boson decaying into $b\bar{b}$ final states produced in weak boson fusion with an associated photon at the LHC*. Phys Rev. **D82**, 093002 (2010).
- JL López-Fontán, C. Santamarina and F. Sarmiento. *New considerations of the Poisson-Boltzmann equation*. Physica A **377** (2007) 15-23.
- C. Santamarina et al. [ATLAS TDAQ]. *Implementation and Performance of the Seeded Reconstruction for the ATLAS Event Filter Selection Software*. IEEE Transactions on Nuclear Science, Volume 53, Issue 3, Part 1 (2006) 864.
- C. Santamarina, B. Adeva et al. [DIRAC collaboration]. *First Measurement of the $\pi^+ \pi^-$ Atom Lifetime*. Physics Letters **B619** (2005) 50.
93 citations counted in INSPIRE as of 14 Feb 2014
- L. Afanasyev, C. Santamarina, A. Tarasov and O. Voskresenskaya. *Dynamics of the Pionium with the Density Matrix Formalism*. Journal of Physics **B37** 4749.
- C. Santamarina, M Schumann, L G Afanasyev and T Heim. *A Monte Carlo Calculation of Pionium break-up probability with different sets of Pionium Target Cross Sections*. Journal of Physics **B36** 4273.
- C. Santamarina, B. Adeva et al. [DIRAC collaboration]. *Detection of $\pi^+ \pi^-$ atoms with the DIRAC spectrometer at CERN*. Journal of Physics **G30** 1929.
- C. Santamarina, B. Adeva et al. [DIRAC collaboration]. *A High Resolution Spectrometer for Pionium Detection*. Nuclear Instrum. and Methods Phys. Res. **A515** 467 (2003).
- C. Santamarina and J.J. Saborido. *An implementation of Atomic Form Factors*. Computer Physics Communications **151** 79 (2003).
- C. Santamarina, B. Adeva et al. *The Time of Flight Detector of the DIRAC Experiment*. Nucl. Instrum. Methods Phys. Res. **A 491** 4 (2002).
- F. Gómez, C. Santamarina et al. *Performance of MSGC with Analog Pipeline Readout*. Nucl. Instrum. Methods Phys. Res. **A 384** 351 (1997).

Conferences, Workshops, Seminars

- Studies of charmless B decays. First Large Hadron Collider Physics Conference. Hotel Catalonia Barcelona Plaza, Barcelona [Spain] (2013).
- New results in B-physics. Fourth International Workshop on Prospects for Charged Higgs Discovery at Colliders. Uppsala University, Uppsala [Sweden] (2012).
- LHCb Summary Talk. III CPAN Days, Centro Nacional de Física de Partículas, Astropartículas y Nuclear, Hotel Catalonia Barcelona Plaza, Barcelona [Spain] (2011).
- Search for New Physics in Hadronic Decays of B meson at the LHCb Experiment. Invited Seminar LIP (Laboratório de Instrumentação e Física Experimental de Partículas). LIP, Lisbon [Portugal] (2011).
- Commissioning of the ATLAS Electron and Photon Trigger Selection. Poster at the Hadron Collider Physics Symposium. Toronto [Canada] 2010.

- Why do we need Higgs or something else? McGill Master Class Invited Seminar. McGill University, Montreal [Canada] 2010.
- Prospects for the Discovery of a Standard Model Higgs Boson Produced via Vector Boson Fusion and Decaying to bb in Association with a Central Photon. Seminar. Universidade de Santiago de Compostela, Santiago de Compostela [Spain] 2009.
- Improvement of L1 and L2 Jet Trigger with Numerical Inversion. Presentation. ATLAS-Canada Workshop University of Toronto, Toronto [Canada] 2009.
- Prospects for the Discovery of a Standard Model Higgs Boson Produced via Vector Boson Fusion and Decaying to bb in Association with a Central Photon. Poster Hadron Collider Physics Symposium. Evian [France] 2009.
- Invisible $Z+Jet \rightarrow \nu\nu$ detection with ATLAS early data (200 pb^{-1}). Seminar. LIP (Laboratório de Instrumentação e Física Experimental de Partículas). LIP, Lisbon [Portugal] 2009.
- Improvement of the ATLAS jet selection using first level trigger jets at the second trigger level. Presentation: ATLAS-Canada Physics Workshop (Jasper). University of Alberta [Canada] 2008.
- HLT/Trigger jets. Presentation and co-chairing of the session. 4th ATLAS Hadronic Calibration Workshop University of Arizona, Tucson [USA] 2008.
- Measurement of ponium ($\pi^+ \pi^-$ hydrogen-like state) lifetime to test low energy QCD predictions. Seminar. Experimental HEP and Astroparticle Physics Wednesday Meetings. McGill University, Montreal [Canada] 2007.
- Trigger Slices Overview. Presentation. 6th ATLAS-Canada Physics Workshop. University of Regina [Canada] 2007.
- Trigger Algorithms & Performance. Presentation. First ATLAS Physics Workshop of the Americas. Stanford Linear Accelerator Complex (SLAC) [USA] 2007.
- Studies on the Trigger Jet Slice performance with $t\bar{t}$ events. Presentation. ATLAS Trigger & Physics Week. CERN, Geneva [Switzerland] 2007.
- High Level Trigger. Presentation. 5th ATLAS-Canada Physics Workshop. University of Toronto [Canada] 2007.
- Status and commissioning plans for HLT. Presentation. Third North American ATLAS Physics Workshop Boston University [USA] 2006.
- The ATLAS Trigger. Presentation. ATLAS Canada Physics Workshop. Carleton University, Ottawa [Canada] 2006.
- Overview of e/γ trigger performance using Rome data. Oral Presentation. ATLAS Trigger & Physics week. CERN, Geneva [Switzerland] 2006.
- Implementation of the ATLAS High Level Trigger Software and Tools for its Performance Optimization. Performance Optimization. Presentation. 4th Conference on Computing in High Energy and Nuclear Physics. Mumbai [India] 2006.
- The ATLAS strategy for Higgs detection. Seminar. Montréal Joint HEP Seminar-McGill University-Iniversité de Montréal. Montreal [Canada] 2005.
- Selecting events to detect Higgs with the ATLAS detector. Seminar. Southern Methodist University. Dallas [USA] 2005.
- Implementation and Performance of the Seeded Reconstruction for the ATLAS EVENT FILTER Selection Software. Poster. 14th IEEE-NPSS Real Time Conference. Stockholm [Sweden] 2005.
- Detection and Lifetime Determination of Ponium in DIRAC, a Review. Seminar: EP Seminar. CERN, Geneva [Switzerland] 2004.
- Gatherer and Offline Monitoring. Presentation. ATLAS TDAQ Workshop: INFN, Frascati [Italy] 2004.
- The Pion-Pion Scattering Lengths from DIRAC. Presentation: Xth International Conference on Hadron Spectroscopy [HADRON 03] Aschaffenburg [Germany] 2003.
- On the Influence of Low n and High n States Cross Section in the Break-up Probability of Ponium. Presentation: International Workshop on Hadronic Atoms [HadAtom02]. CERN, Geneva [Switzerland] 2002.
- DIRAC PS-212. An Experiment to Measure Ponium Lifetime. Poster: XIVth Rencontres de Blois. Blois [France] 2002.
- DIRAC (PS-212) Experiment at CERN. Presentation: International Workshop on Hadronic Atoms [HadAtom01]. Bern University [Switzerland] 2001.
- Cálculo de la Probabilidad de Ruptura del Ponium por Monte Carlo. Presentation: XXVIII Reunión de la Real Sociedad Española de Física. Seville [Spain] 2001.