

Rebeca Gonzalez Suarez

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Current position

Adjunct Research Associate at the University of Nebraska, Lincoln, US since Nov. 1st 2012

Previous positions

- 2010-2012 Post-doctoral fellow at the Vrije Universiteit Brussel (VUB), Brussels [Belgium]
- 2006-2010 PhD Student with an FPI grant at Instituto de Fisica de Cantabria (IFCA), Santander [Spain]

Education

- 2010 PH.D at the University of Cantabria, Santander [Spain]
- 2007 D.E.A, Diploma de Estudios Avanzados at the University of Cantabria, Santander [Spain]
- 2005 Degree in Fundamental Physics at the Universidad de Oviedo, Oviedo [Spain]

Theses

- 2010 PH.D THESIS (9 Sep.)
Search for a SM Higgs Boson in the LHC with the CMS experiment using the $H \rightarrow WW^ \rightarrow 2\mu 2\nu$ decay channel*
Supervisors: J. Cuevas and T. Anoro.
- 2007 Diploma de Estudios Avanzados (21 Dec.)
Search for a Higgs boson in CMS in the $H \rightarrow WW^ \rightarrow 2\mu 2\nu$ decay channel*
Supervisors: J. Cuevas and T. Anoro.

Positions of Responsibility

- 2015-2017 **Higgs to WW convener:** Coordinator of the Higgs to WW physics in the CMS experiment, covering all analyses studying the decay of the Higgs in two W bosons, independently of the production mode. Level 3 management within the CMS collaboration (Higgs group)
- 2013-2014 **Single Top convener:** Coordinator of single-top-quark related physics in the CMS experiment. Level 3 management within the CMS collaboration (Top group)
Editor and contact of the publications arXiv:1411.3441 (PRD), and arXiv:1209.3489 (PRL); and of other public documents (TOP-11-022, HIG-14-012)
- 2014-2015 **Contact person** person for the simulation in the Higgs to WW subgroup
- 2011-2012 **Contact person** and developer of the local reconstruction of the Strip Tracker
- 2011-2012 **Contact person** for the High Level Trigger - Strip Tracker
- 2015 **Run Field Manager** coordinating during two weeks the operations of the CMS experiment, operating as the link between the shift crews and Run coordination

Participation in Thesis Boards

- 2015 **PhD thesis committee** (20th March) at Uppsala University [Sweden]
Thesis Title: *Search for a Charged Higgs Boson in ATLAS and Development of Novel Technology for Future Particle Detector Systems*
by Daniel Pelikan
- 2013 **Master thesis promotor** (24 June) at the Vrije Universiteit Brussel [Belgium]
Thesis Title: *Measurement of the single top tW associated production in the dilepton decay channel in proton proton collisions at a center of mass energy of 8 TeV*
by Isis Marina Van Parijs

Seminars

- 2015 **Seminar at Stony Brook University**
17 December, Stony Brook, NY [United States]
Top quark and Higgs boson physics at the LHC
- Wine & Cheese: Fermilab Joint Experimental - Theoretical Physics Seminar**
20 November, Batavia, IL [United States]
Recent Results from CMS on Top and Higgs
- LPC Physics Forum**
13 August, Fermilab, Batavia IL [United States]
 $H \rightarrow WW$ at CMS
- Seminar at the University of Nebraska, Lincoln**
10 August, University of Nebraska, Lincoln NE [United States]
Higgs boson decays to WW at CMS
- Seminar at University of Goettingen, II. Physikalisches Institut**
19th June, Goettingen [Germany]
Overview of single top physics in CMS with Run-1 data
- Seminar at the Universite Catholique de Louvain**
18th March, Louvain la Neuve [Belgium]
Is it the Higgs? Characterization of the $H(125)$ resonance (spin, parity, tensor structure) with leptonic WW decays
- Seminar at the EPFL Lausanne**
2d of March, Lausanne [Switzerland]
Overview of single top physics in CMS with Run-1 data
- 2014 **CERN Collider Cross Talk**
27 November, CERN [Switzerland]
 $H \rightarrow WW$ from ATLAS and CMS
- LHC seminar**
25 February, CERN [Switzerland]
Recent top physics results from CMS
- 2013 **Seminar at Uppsala University** 10 October, Uppsala [Sweden]
Overview of single top results at the LHC

Conferences

- 2016 **APS April 2016:** American Physical Society April Meeting 2016
Invited Plenary Talk: *Higgs Physics at the LHC*
16-19 Apr, Salt Lake City, UT [United States]
- 2015 **DPF2015:** Meeting of the Division of Particles and Fields of the American Physical Society
Parallel Talk: *Run-1 Single-top measurements at CMS*
4-8 Aug, University of Michigan, Ann Arbor, MI [United States]
SM@LHC: Standard Model at LHC
Plenary Talk: *LHC results on Spin, Anomalous Couplings, and CP structure*
21-24 April, Galileo Galilei Institute, Florence [Italy]
- 2014 **Second CMS Single Top Workshop**
Scientific Program and Talk: *Lessons learned from Run1 and future prospects*
4-5 December, Palazzo Alabardieri, Naples [Italy]
LHCP 2014: The Second Large Hadron Collider Physics conference
Chair of the TOP Parallel sessions
2-7 June, New York City [United States]
- 2013 **CMS Single Top Workshop**
Scientific Program and Closing Talk: *Next steps and summary*
19-20 December, Palazzo Alabardieri, Naples [Italy]
TOP2013: 6th International Workshop on Top Quark Physics
Plenary Talk *Inclusive single top cross section at the LHC*
4-19 September, Durbach [Germany]
- 2012 **4th generation and single-top:** Workshop on fourth fermion generation and on single-top production
Invited Talk: *tW production at CMS*
26-28 March, Leinsweiler [Germany]
Rencontres de Moriond QCD and High Energy Interactions
Plenary Talk: *Single Top Production at $\sqrt{s} = 7\text{TeV}$*
10-17 March, La Thuile [Italy]
- 2010 **II CPAN days:** Segundas Jornadas del CPAN
Invited Plenary Talk: *Higgs and SUSY searches in CMS*
29-30 November, Valencia [Spain]
BEACH 2010 IX International Conference on Hyperons, Charm and Beauty Hadrons
Plenary Talk: *Higgs Search Prospects at the LHC*
Chair of the session: Heavy Flavor Decays and Properties - I
21-26 June, Perugia [Italy]
- 2009 **PASCOS 2009:** 15th International Symposium on Particles Strings and Cosmology
Parallel Talk: *EW symmetry breaking at the LHC*
6-10 July, Hamburg [Germany]
- 2008 **ICHEP08:** 34th International Conference on High Energy Physics
Poster: *Discovery Potential for the SM Higgs Boson in the $H \rightarrow WW^* \rightarrow 2l2\nu$ channel at the LHC*
July 29 - August 5, Philadelphia, Pennsylvania [United States]

2007

CHEP07: International Conference on Computing in High Energy and Nuclear Physics
Poster (co-author): *A software and computing prototype for CMS Muon system alignment*
2-7 September, Victoria BC [Canada]

Membership of Analysis Review Committees

- 2016
 - ◇ *Measurement of the top quark mass from single-top production events* - TOP-15-001 [Chair]
- 2015
 - ◇ *Search for the associated production of a Higgs boson with a single top quark in proton-proton collisions at $\sqrt{s} = 8$ TeV* - arXiv:1509.08159, Sub. to JHEP
 - ◇ *Measurement of the top-quark mass from the b jet energy spectrum* - TOP-15-002 [Chair]
 - ◇ *Measurement of the charge asymmetry in top quark pair production in pp collisions at $\sqrt{s} = 8$ TeV using a template method* - arXiv:1508.03862, Accepted Phys. Rev. D
 - ◇ *Measurement of the W boson helicity using $t\bar{t}$ events in the dilepton final state at $\sqrt{s} = 8$ TeV* - TOP-14-017 [Chair]
 - ◇ *Search for a standard model Higgs boson produced in association with a top-quark pair and decaying to bottom quarks using a matrix element method* - arXiv:1502.02485 Eur. Phys. J. C 75 (2015) 251
 - ◇ *Search for monotop signatures in proton-proton collisions at $\sqrt{s} = 8$ TeV* - arXiv:1410.1149 Phys. Rev. Lett. 114, 101801 (2015) [Chair]
- 2014
 - ◇ *Search for $t\bar{t}H$ events in the $H \rightarrow b\bar{b}$ final state using the Matrix Element Method* - HIG-14-010
 - ◇ *Searches for electroweak production of charginos, neutralinos, and sleptons decaying to leptons and W , Z , and Higgs bosons in pp collisions at 8 TeV* - arXiv:1405.7570, EPJC 74 (2014) 3036
 - ◇ *Search for new physics with monotop final states in pp collisions at $\sqrt{s} = 8$ TeV* - B2G-12-022 [Chair]
 - ◇ *Search for associated production of a single top quark and a Higgs boson in events where the Higgs boson decays to two photons at $\sqrt{s} = 8$ TeV* - HIG-14-001
- 2013
 - ◇ *Projections for Top FCNC Searches in 3000 fb^{-1} at the LHC* - FTR-13-016
 - ◇ *Sensitivity study of the prospects for searching for heavy vector-like charge $2/3$ quarks at $\sqrt{s} = 14$ TeV with the upgraded CMS detector* - FTR-13-026
 - ◇ *Projected improvement of the accuracy of top-quark mass measurements at the upgraded LHC* - FTR-13-017
 - ◇ *CMS reach in $B_s^0 \rightarrow \mu^+ \mu^-$ and $B^0 \rightarrow \mu^+ \mu^-$ branching fractions for the new LHC runs* - FTR-13-022
 - ◇ *Search for electroweak production of charginos and neutralinos using leptonic final states* - SUS-13-006
 - ◇ *Search for electroweak production of charginos, neutralinos and sleptons using leptonic final states in pp collisions at $\sqrt{s} = 8$ TeV* - SUS-12-022
- 2012
 - ◇ *Search for electroweak production of charginos and neutralinos using leptonic final states in pp collisions at $\sqrt{s} = 7$ TeV* - arXiv:1209.6620, JHEP 1211 (2012) 147
 - ◇ *Search for physics beyond the standard model in events with a Z boson, jets, and missing transverse energy in pp collisions at $\sqrt{s} = 7$ TeV* - arXiv:1204.3774, Physics Letters B 716 (2012) 260-284
- 2011
 - ◇ *Search for Physics Beyond the Standard Model in Z +MET+Jets events at the LHC* - SUS-11-019

Selected Journal articles

Ordered: PA = Primary Author; ED = Editor; C = Contributor; R = Review; P = Proceedings

- 2015 ◇ CMS Collab. *Constraints on the spin-parity and anomalous HVV couplings of the Higgs boson in proton collisions at 7 and 8 TeV* arXiv:1411.3441, Phys. Rev. D 92, 012004 [PA-ED]
- 2014 ◇ CMS Collab. *Observation of the associated production of a single top quark and a W boson in pp collisions at $\sqrt{s} = 8\text{TeV}$* , arXiv:1401.2942, Phys. Rev. Lett. 112, 231802. [PA]
- ◇ CMS Collab. *Measurement of Higgs boson production and properties in the WW decay channel with leptonic final states*, arXiv:1312.1129, JHEP 01(2014)096 [PA]
- 2013 ◇ CMS Collab. *Evidence for associated production of a single top quark and W boson in pp collisions at 7 TeV*, arXiv:1209.3489, Phys. Rev. Lett. 110, 022003 (2013) [PA-ED]
- 2015 ◇ CMS Collab. *Search for the associated production of a Higgs boson with a single top quark in proton-proton collisions at $\sqrt{s} = 8\text{TeV}$* , arXiv:1509.08159, Sub. to JHEP [C-R]
- ◇ CMS Collab. *Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8 TeV*, arXiv:1412.8662, Eur. Phys. J. C 75 (2015) 212 [C]
- 2013 ◇ *Snowmass 2013 Top quark working group report*, arXiv:1311.2028 [C]
- 2012 ◇ CMS Collab. *Search for the standard model Higgs boson decaying to a W pair in the fully leptonic final state in pp collisions at $\sqrt{s} = 7\text{TeV}$* , arXiv:1202.1489, Phys.Lett. B 710 (2012) 91-113 [C]
- 2011 ◇ CMS Collab. *Measurement of the $t\bar{t}$ Production Cross Section in pp Collisions at 7 TeV in Lepton + Jets Events Using b-quark Jet Identification*, arXiv:1108.3773, Phys.Rev. D84 (2011) 092004 [C]
- ◇ CMS Collab. *Measurement of W^+W^- Production and Search for the Higgs Boson in pp Collisions at $\sqrt{s} = 7\text{TeV}$* , arXiv:1102.5429, Phys.Lett. B 699 (2011) 25-47 [C]
- 2016 ◇ CMS Collab. *Search for Higgs boson off-shell production in proton-proton collisions at 7 and 8 TeV and derivation of constraints on its total decay width*, arXiv:1605.02329, Submitted to J. High Energy Phys [R - Higgs to WW]
- ◇ CMS Collab. *Search for s channel single top quark production in pp collisions at $\sqrt{s} = 7$ and 8 TeV*, arXiv:1603.02555, Submitted to J. High Energy Phys [R - Single Top]
- 2015 ◇ CMS Collab. *Search for anomalous single top quark production in association with a photon in pp collisions at $\sqrt{s} = 8\text{TeV}$* , arXiv:1511.03951, Accepted by J. High Energy Phys [R - Single Top]
- ◇ CMS Collab. *Measurement of top quark polarisation in t-channel single top quark production*, arXiv:1511.02138, Accepted by J. High Energy Phys [R - Single Top]
- ◇ CMS Collab. *Measurement of the W boson helicity in events with a single reconstructed top quark in pp collisions at $\sqrt{s} = 8\text{TeV}$* , arXiv:1410.1154, JHEP01(2015)053 [R - Single Top]
- 2014 ◇ CMS Collab. *Measurement of the t-channel single-top-quark production cross section and of the $|V_{tb}|$ CKM matrix element in pp collisions at $\sqrt{s} = 8\text{TeV}$* , arXiv:1403.7366, JHEP 06 (2014)

090 [R - Single top]

- 2015 ◇ *Run-1 Single-top measurements at CMS*, Proceedings DPF 2015, arXiv:1510.05235 [P]
- 2014 ◇ *Inclusive single top cross section at the LHC*, Proceedings TOP 2013, DOI:10.3204/DESY-PROC-2014-02/16 [P]
- 2012 ◇ *Single top Production at $\sqrt{s} = 7$ TeV*, Proceedings Moriond 2012, arXiv:1205.2786 [P]
- 2010 ◇ *Higgs search prospects at the LHC*, Proceedings BEACH 2010, Nucl.Phys.Proc.Suppl. 210-211 (2011) 283-288 [P]
- 2008 ◇ *Discovery Potential for the SM Higgs Boson in the $H \rightarrow WW^* \rightarrow 2l2\nu$ channel at LHC*, Proceedings ICHEP 2008, arXiv:0810.1468 [P]
- ◇ *A Software and Computing prototype for CMS Muon System alignment*, Proceedings CHEP 2007, Journal of Physics: Conference Series 119 (2008) 072008 [P]

Selected Public Results

Ordered: PA = Primary Author; ED = Editor; C = Contributor; R = Review

- 2014 ◇ *Constraints on Anomalous HWW Interactions using Higgs boson decays to $W+W^-$ in the fully leptonic final state* - HIG-14-012 [PA- ED]
- 2012 ◇ *Observation of Associated Production of a Single Top Quark and W Boson in pp Collisions at $\sqrt{s} = 8$ TeV* - TOP-12-040 [PA]
- 2011 ◇ *Search for single top tW associated production in the dilepton decay channel in pp collisions at $\sqrt{s} = 7$ TeV* - TOP-11-022 [PA- ED]
- 2010 ◇ *Performance of muon identification in pp collisions at $\sqrt{s} = 7$ TeV* - MUO-10-002 [PA]
- 2008 ◇ *Search Strategy for a Standard Model Higgs Boson Decaying to Two W Bosons in the Fully Leptonic Final State'* - HIG-08-006 [PA]
- 2007 ◇ *Search for the Higgs boson in the WW decay channel with the CMS experiment'* - HIG-07-001 [PA]

- 2016 ◇ *Search for ttH production in multilepton final states at $\sqrt{s} = 13$ TeV* - HIG-15-008 [C,R - Higgs to WW]
- 2015 ◇ *Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at $\sqrt{s} = 7$ and 8 TeV* - HIG-15-002 [C]
- 2014 ◇ *Search for $H \rightarrow b\bar{b}$ in association with single top quarks as a test of Higgs boson couplings* - HIG-14-015 [C]
- ◇ *Combination of cross-section measurements of associated production of a single top-quark and a W boson at $\sqrt{s} = 8$ TeV with the ATLAS and CMS experiments* - TOP-14-009 [C-R Single top]
- ◇ *Constraints on anomalous HVV interactions using H to $4l$ decays* - HIG-14-014 [C]
- 2011 ◇ *Measurement of the top-quark pair-production cross section in the lepton+jets channel with the*

- use of b-tagging* - TOP-10-003 [C]
- 2010
- ◇ *Search for $H \rightarrow WW \rightarrow 2l 2\nu$* - HIG-10-003 [C]
 - ◇ *Observation of WW final state* - EWK-10-009 [C]
- 2016
- ◇ *Search for resonant Higgs boson pair production in the $b\bar{b}l\nu l\nu$ final state at $\sqrt{s} = 13\text{TeV}$* - HIG-16-011 [R - Higgs to WW]
- 2015
- ◇ *Measurement of the transverse momentum spectrum of the Higgs boson produced in pp collisions at $\sqrt{s} = 8\text{TeV}$ using the $H \rightarrow WW$ decays* - HIG-15-010 [R - Higgs to WW]
- 2014
- ◇ *Measurements of the differential cross section of single top-quark production in the t channel in proton-proton collisions at $\sqrt{s} = 8\text{TeV}$* - TOP-14-004 [R - Single top]
 - ◇ *Search for anomalous Wtb couplings and top FCNC in t-channel single-top-quark events* - TOP-14-007 [R - Single top]
 - ◇ *Search for anomalous single top quark production in association with a photon* - TOP-14-003 [R - Single top]
- 2013
- ◇ *Search for s-channel single top-quark production in pp collisions at $\sqrt{s} = 8\text{TeV}$* - TOP-13-009 [R - Single top]
 - ◇ *Measurement of top quark polarization in t-channel single-top production* - CMS-PAS-TOP-13-001 [R - Single top]
 - ◇ *Combination of single top-quark cross-sections measurements in the t-channel at $\sqrt{s} = 8\text{TeV}$ with the ATLAS and CMS experiments* - TOP-12-002 [R - Single top]
 - ◇ *Search for Flavor-Changing Neutral Currents in tZ events in proton-proton collisions at $\sqrt{s} = 7\text{TeV}$* - TOP-12-021 [R - Single top]
 - ◇ *Measurement of the single-top t-channel charge ratio at 8 TeV* - TOP-12-038 [R - Single top]
 - ◇ *Measurement of W-helicity fractions in single top events topology* - TOP-12-020 [R - Single top]

There are more publications and results of which I am also an author. For details consult my publication list.

Outreach Activities

Without specific order

- **Official CERN and CMS guide** with more than 100 visits underground, including virtual visits for international audiences
- **CERN contact** of the Expanding your horizons (EYH) event in Geneva: 2015-2013. Organizer of the 4 CERN workshops. Workshop leader of the *Build your own accelerator* session in 2015
- Workshop leader of the *Questions without answers at the LHC* session in the EYH event in Geneva in 2011
- **Moderator** of the International Masterclasses by the International Particle Physics Outreach Group (IPPOG) (2015-2016)
- CMS Guide, school@CMS (2016-2015)
- *Ask a scientist* in the night of the Researchers (FNAC Rive Geneva 2014, FNAC Ballexert Geneva 2015)
- CMSVoices Twitter account of February 2016

- Role in the April Fools' Day video from CERN [link] (2016)
- Role in the official CERN LHC Season 2 videos [link] (2015)
- Speaking role in the videos advertising the US contribution to the CMS Experiment [link] (2014)
- Contributions to the CMS blog: *the Cylindrical Onion*
- Contributions to the IPPOG website
- Spanish subtitles for the CMS introduction video, [link]
- Personal blog with CERN pictures, *lonelychairsatcern.tumblr.com* (20K followers)
- *Particle Fever* movie meet and greet in the University of Columbia (NY) (2014)
- Guest speaker at ENP Ferney for gender awareness training (2012)

Other Activities

Supervisor of summer students at CERN in 2012 (Isis Marina Van Parijs) and co-supervisor in 2013 (Ivan Shvetsov), both projects related to single top physics.

CMS detector operation tasks: Offline Drift Tube muon chambers (DT) (2008), DT online (2009), DT on-call (2010), Detector Control Safety (DCS) (2010-2011), **Shift Leader** (2012-today) shifts, and **Run Field Manager** (2015)

Rebeca Gonzalez Suarez, May 10, 2016