

## Current position

**Adjunct Research Associate**, *University of Nebraska, Lincoln*, US.  
Since November 1st, 2012.

## Previous positions

2010-2012 **Post-doctoral fellow**, *Vrije Universiteit Brussel (VUB)*, BE.  
2006-2010 **PhD Student**, *Instituto de Fisica de Cantabria (IFCA)*, ES.

## Education

2010 **Ph.D.**, (9 September), *University of Cantabria*, ES.  
2007 **DEA, Diploma de Estudios Avanzados**, *University of Cantabria*, ES.  
2005 **Degree in Fundamental Physics**, *Universidad de Oviedo*, ES.

## Ph.D Thesis

title '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' [link]  
supervisors J. Cuevas and T. Anoro

## Coordination positions

2016-2018 **Top convener**  
Coordinator of the top quark Physics Analysis Group of the CMS experiment. Level 2 management within the CMS collaboration. Physics coordination.

2015-2016 **Higgs to WW convener**  
Coordinator of the Higgs to WW physics in the CMS experiment. 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.

## Other positions of responsibility

2014-2015 **Contact person**, *Monte Carlo Simulation*, Higgs to WW subgroup.  
2011-2012 **Contact person**, *Local reconstruction of the Strip Tracker*.  
2011-2012 **Contact person**, *High Level Trigger for the Strip Tracker*.

2015-2016 **Run Field Manager**, *Coordinating the operations of the CMS experiment, link between the shift crews and Run coordination.*

Editor and contact of arXiv:1411.3441 (PRD), and arXiv:1209.3489 (PRL); and of public documents TOP-11-022, and HIG-14-012.

## Participation in Thesis Boards

2016 **PhD thesis committee**, (16th September), IUT de Colmar, FR.  
*'Recherche d'événements monotop dans le canal leptonique avec l'expérience CMS du LHC'* by Michael Buttignol.

2015 **PhD thesis committee**, (20th March), Uppsala University, SE.  
*'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), Vrije Universiteit Brussel, BE.  
*'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

2016 **University of Zurich seminar**, *'Top quark physics in Run 2 with the CMS experiment'*, (5 December), Zurich, CH.

**UK HEP Forum**, *'Top physics'*, (3 November), Abingdon, UK.

**Teilchenkolloquium - Particle Physics Colloquium at University of Heidelberg**, *'Top quark physics at 13 TeV with the CMS experiment at the LHC'*, (5 July), Heidelberg, DE.

2015 **Seminar at Stony Brook University**, *'Top quark and Higgs boson physics at the LHC'*, (17 December), Stony Brook, NY, US.

**Wine & Cheese: Fermilab Joint Experimental - Theoretical Physics Seminar**, *'Recent Results from CMS on Top and Higgs'*, (20 November), Fermilab Batavia, IL, US.

**LPC Physics Forum**, *' $H \rightarrow WW$  at CMS'*, (13 August), Fermilab Batavia, IL, US.

**Seminar at the University of Nebraska, Lincoln**, *'Higgs boson decays to  $WW$  at CMS'*, (10 August), Lincoln NE, US.

**Seminar at University of Goettingen, II. Physikalisches Institut**, *'Overview of single top physics in CMS with Run-1 data'*, (19 June), Goettingen, DE.

**Seminar at the Universite Catholique de Louvain**, *'Is it the Higgs? Characterization of the  $H(125)$  resonance (spin, parity, tensor structure) with leptonic  $WW$  decays'*, (18 March), Louvain la Neuve, BE.

**Seminar at the EPFL Lausanne**, *'Overview of single top physics in CMS with Run-1 data'*, (2 March), Lausanne, CH.

- 2014 **CERN Collider Cross Talk**, ' $H \rightarrow WW$  from ATLAS and CMS', (27 November), CERN, CH.  
**LHC seminar**, 'Recent top physics results from CMS', (25 February), CERN, CH.
- 2013 **Seminar at Uppsala University**, 'Overview of single top results at the LHC', (10 October), Uppsala, SE.

## Conferences

- 2016 **TOP2016: 9th International Workshop on Top Quark Physics**, *Chair of the session: Latest Results from ATLAS and CMS*, (19-23 Sep.), Olomuc, CZ.  
**Third CMS Single Top Workshop**, *Organizing Committee, Scientific Program*, (2-3 Jun), Strasbourg, FR.  
**APS April 2016: American Physical Society April Meeting 2016**, *Invited Plenary Talk: 'Higgs Physics at the LHC'*, (16-19 Apr), Salt Lake City, UT, US.
- 2015 **DPF2015: Meeting of the Division of Particles and Fields of the American Physical Society**, *Invited Parallel Talk: 'Run-1 Single-top measurements at CMS'*, (4-8 Aug), University of Michigan, Ann Arbor, MI, US.  
**SM@LHC: Standard Model at LHC**, *Plenary Talk: 'LHC results on Spin, Anomalous Couplings, and CP structure'*, (21-24 Apr), Galileo Galilei Institute, Florence, IT.
- 2014 **Second CMS Single Top Workshop**, *Scientific Program and Talk: 'Lessons learned from Run1 and future prospects'*, (4-5 Dec), Naples, IT.  
**LHCP 2014: The Second Large Hadron Collider Physics conference**, *Chair of the TOP Parallel sessions*, (2-7 June), New York City, US.
- 2013 **CMS Single Top Workshop**, *Scientific Program and Closing Talk: 'Next steps and summary'*, (19-20 Dec), Naples, IT.  
**TOP2013: 6th International Workshop on Top Quark Physics**, *Plenary Talk: 'Inclusive single top cross section at the LHC'*, (4-19 Sep), Durbach, DE.
- 2012 **4th generation and single-top: Workshop on fourth fermion generation and on single-top production**, *Invited Talk: 'tW production at CMS'*, (26-28 Mar), Leinsweiler, DE.  
**Rencontres de Moriond - QCD and High Energy Interactions**, *Plenary Talk: 'Single Top Production at  $\sqrt{s} = 7\text{TeV}$ '*, (10-17 Mar), La Thuile, IT.
- 2010 **II CPAN days: Segundas Jornadas del CPAN**, *Invited Plenary Talk: 'Higgs and SUSY searches in CMS'*, (29-30 Nov), Valencia, ES.  
**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 Jun), Perugia, IT.
- 2009 **PASCOS 2009: 15th International Symposium on Particles Strings and Cosmology**, *Parallel Talk: 'EW symmetry breaking at the LHC'*, (6-10 Jul), Hamburg, DE.

- 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'*, (Jul 29 - Aug 5), Philadelphia, Pennsylvania, US.
- 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 Sep), Victoria BC, CA.

## Membership of Analysis Review Committees

I currently am the postdoc that has participated in most Analysis Review Committees, internal editorial boards, in the CMS collaboration.

- 2016 **Measurement of the top quark mass in the dileptonic  $t\bar{t}$  decay channel using the Mbl, MT2, and MAOS Mblv observables**, *TOP-15-008*, [Chair](#).  
**Measurement of the W boson helicity fractions in the decays of top quark pairs to lepton+jets final states produced in pp collisions at  $\sqrt{s} = 8$  TeV**, *arXiv:1605.09047*, Submitted to Phys. Lett. B.  
**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*, Phys. Rev. D 93, 034014 (2016).  
**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  $3000\text{fb}^{-1}$  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 by: PA = Primary Author; ED = Editor; C = Contributor; R = Review; P = Proceedings

### Primary Author, Editor

- 2015 **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 **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].  
**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 **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].

### Contribution

- 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*, JHEP06(2016)177, [C-R].  
**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 **Search for the standard model Higgs boson decaying to a W pair in the fully leptonic final state in pp collisions at  $\sqrt{s} = 7$  TeV**, *arXiv:1202.1489*, Phys.Lett. B 710 (2012) 91-113, [C].
- 2011 **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].
- Measurement of  $W^+W^-$  Production and Search for the Higgs Boson in  $pp$  Collisions at  $\sqrt{s} = 7$  TeV**, *arXiv:1102.5429*, Phys.Lett. B 699 (2011) 25-47, [C].

#### Review

- 2016 **Measurement of the transverse momentum spectrum of the Higgs boson produced in pp collisions at  $\sqrt{s} = 8$  TeV using H to WW decays**, *arXiv:1606.01522*, Submitted to J. High Energy Phys, **500<sup>th</sup> paper of CMS** [R - Higgs to WW].
- 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].
- 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 **Search for anomalous single top quark production in association with a photon in pp collisions at  $\sqrt{s} = 8$  TeV**, *arXiv:1511.03951*, JHEP 04 (2016) 035, [R - Single Top].
- Measurement of top quark polarisation in t-channel single top quark production**, *arXiv:1511.02138*, JHEP 04 (2016) 073, [R - Single Top].
- Measurement of the W boson helicity in events with a single reconstructed top quark in pp collisions at  $\sqrt{s} = 8$  TeV**, *arXiv:1410.1154*, JHEP01(2015)053, [R - Single Top].
- 2014 **Measurement of the t-channel single-top-quark production cross section and of the  $|V_{tb}|$  CKM matrix element in pp collisions at  $\sqrt{s} = 8$  TeV**, *arXiv:1403.7366*, JHEP 06 (2014) 090, [R - Single top].

#### Conference Proceedings

- 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].

- 2007 **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

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

### Primary Author, Editor

- 2016 **First results on Higgs to WW at  $\sqrt{s} = 13$  TeV**, *HIG-15-003*, [ED- HWW].
- 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].

### Contribution

- 2016 **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-15-019*, [C].
- 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].
- Measurement of the top-quark pair-production cross section in the di-lepton channel at 7 TeV**, *TOP-10-005*, [C].
- 2010 **Search for  $H \rightarrow WW \rightarrow 2l 2\nu$** , *HIG-10-003*, [C].



Observation of WW final state, *EWK-10-009*, [C].

[Review](#)

- 2016 **Search for Higgs boson pair production in the  $b\bar{b}l\nu l\nu$  final state at  $\sqrt{s} = 13$  TeV, *HIG-16-024*, [R - Higgs to WW].**  
**Search for high mass Higgs to WW with fully leptonic decays using 2015 data, *HIG-16-023*, [R - Higgs to WW].**  
**Search for associated production of Higgs bosons and top quarks in multi-lepton final states at  $\sqrt{s} = 13$  TeV, *HIG-16-022*, [R - Higgs to WW].**  
**Search for associated production of a Z boson with a single top quark and for tZ flavour-changing interactions in pp collisions at  $\sqrt{s} = 8$  TeV, *TOP-12-039*, [R - Single top].**  
**Search for resonant Higgs boson pair production in the  $b\bar{b}l\nu l\nu$  final state at  $\sqrt{s} = 13$  TeV, *HIG-16-011*, [R - Higgs to WW].**
- 2015 **Measurement of the transverse momentum spectrum of the Higgs boson produced in pp collisions at  $\sqrt{s} = 8$  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  $\sqrt{s} = 8$  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  $\sqrt{s} = 8$  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  $\sqrt{s} = 8$  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  $\sqrt{s} = 7$  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:

- Appearance in the Spanish TV program about science 'El cazador de cerebros', 29 October 2016.
- Invited speaker at the 'XXV Jornadas de Astronomía' of the science society *Aranzadi*. Seminar: 'Puede el LHC producir materia oscura? Partículas elementales y el límite entre micro y macro cosmos'. 4 October 2016, San Sebastián, Spain (link to video).
- **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)
- Member of the jury for the *I Premio Premio José Ramón Lueje de Investigación y Comunicación*, science communication awards for high school students, Cangas de Onís, Asturias (2015)
- *Particle Fever* movie meet and greet in the University of Columbia (NY) (2014)
- Guest speaker at ENP Ferney for gender awareness training (2012)
- 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)
- Spanish subtitles for the CMS introduction video, [link]
- Contributions to the International Particle Physics Outreach Group (IPPOG) website
- *CMSVoices* Twitter account of February 2016
- Contributions to the CMS blog: *the Cylindrical Onion*
- Personal blog with CERN pictures, *lonelychairsatcern.tumblr.com* (20K followers)

## 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-today)

Member of the Royal Spanish Society of Physics (RSEF).

🚩 International Fellow of the Explorers Club (Western Europe Chapter).

December 5, 2016