

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

- **Top convener.** Coordinator of the top quark Physics Analysis Group of the CMS experiment. Level 2 management within the CMS collaboration. Physics coordination. [2016-2018]
- **Higgs to WW convener.** Coordinator of the Higgs to WW physics in the CMS experiment. Level 3 management within the CMS collaboration. Higgs group. [2015-2016]
- **Single Top convener.** Coordinator of single-top-quark related physics in the CMS experiment. Level 3 management within the CMS collaboration. Top group. [2013-2014]

Other positions of responsibility

- **Run Field Manager.** Coordinating the operations of the CMS experiment on-site in LHC point 5, link between the shift crews and Run coordination. [2015-2017]
- *Contact person.* Monte Carlo Simulation, Higgs to WW subgroup. [2014-2015]
- *Contact person.* Local reconstruction of the Strip Tracker. [2011-2012]
- *Contact person.* High Level Trigger for the Strip Tracker. [2011-2012]
- 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

- 2017 **Workshop on top physics at the LC 2017**, '*Recent LHC results*', (8 of June), CERN, CH.
University at Albany, '*It is not lonely at the top: studying the heaviest quark at the LHC*', (16 of February), Albany, NY, US.
University of Kansas, '*It is not lonely at the top: studying the heaviest quark at the LHC*', (23 January), Lawrence, KS, US.
- 2016 **University of Zurich**, '*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 **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.
University of Nebraska, Lincoln, '*Higgs boson decays to WW at CMS*', (10 August), Lincoln NE, US.
University of Goettingen, II. Physikalisches Institut, '*Overview of single top physics in CMS with Run-1 data*', (19 June), Goettingen, DE.
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.
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

- 2017 **LHCP 2017: The Fifth Annual Large Hadron Collider Physics conference**, *Chair of the TOP Parallel sessions*, (14-20 May), Shanghai Jiao Tong University, CN.
- 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 Columbia University, 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

- 2016 **Measurement of the top quark mass in the dileptonic ttbar 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 $\sqrt{s} = 8\text{ TeV}$** , *arXiv:1605.09047*, Phys. Lett. B 762 (2016) 512.
- 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 $\sqrt{s} = 8\text{ TeV}$** , *arXiv:1509.08159*, JHEP06(2016)177.
- 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 $\sqrt{s} = 8\text{ TeV}$ 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 $\sqrt{s} = 8\text{ TeV}$** , *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 $\sqrt{s} = 8\text{ TeV}$** , *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 $\sqrt{s} = 8\text{ TeV}$** , *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 $\sqrt{s} = 8\text{ TeV}$** , *HIG-14-001*.
- 2013 **Projections for Top FCNC Searches in 3000fb^{-1} at the LHC**, *FTR-13-016*.
- Sensitivity study of the prospects for searching for heavy vector-like charge 2/3 quarks at $\sqrt{s} = 14\text{ TeV}$ 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

2017 **Recent CMS results in top and Higgs physics, *arXiv:1707.05054*, Modern Physics Letters A, 2, Vol. 32, No. 29 (2017) 1730026, [PA-ED].**

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 (2015), [PA-ED].**

2014 **Observation of the associated production of a single top quark and a W boson in pp collisions at $\sqrt{s} = 8$ TeV, *arXiv:1401.2942*, Phys. Rev. Lett. 112, 231802 (2014), [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

2016 **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, *arXiv:1606.02266*, JHEP 1608 (2016) 045, [C].**

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].**

Observation of a new boson with mass near 125 GeV in pp collisions at $\sqrt{s} = 7$ and 8 TeV, *arXiv:1303.4571*, JHEP 1306 (2013) 081, [C].

2012 **Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC, *arXiv:1207.7235*, Phys.Lett. B716 (2012) 30-61, [C].**

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*, JHEP 03 (2017) 032, **500th 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*, JHEP 09 (2016) 051, [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*, JHEP 09 (2016) 027, [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].

Publications from top

- 2017 **Measurement of normalized differential $t\bar{t}$ cross sections in the dilepton channel from pp collisions at $\sqrt{s} = 13$ TeV**, *Submitted to JHEP*, *arXiv:1708.07638*.
- Measurement of the semileptonic $t\bar{t} + \gamma$ production cross section in pp collisions at $\sqrt{s} = 8$ TeV**, *Submitted to JHEP*, *arXiv:1706.08128*.
- Measurements of $t\bar{t}$ cross sections in association with b jets and inclusive jets and their ratio using dilepton final states in pp collisions at $\sqrt{s} = 13$ TeV**, *Submitted to Phys. Lett. B*, *arXiv:1705.10141*.
- Measurement of the top quark mass in the dileptonic $t\bar{t}$ decay channel using the mass observables M_{bl} , M_{T2} , and M_{lb} in pp collisions at $\sqrt{s} = 8$ TeV**, *Phys. Rev. D* 96 (2017) 032002, *arXiv:1704.06142*.
- Measurement of the jet mass in highly boosted $t\bar{t}$ events from pp collisions at $\sqrt{s} = 8$ TeV**, *Eur. Phys. J. C* 77 (2017) 467, *arXiv:1703.06330*.
- Measurement of the top quark mass using single top quark events in proton-proton collisions at $\sqrt{s} = 8$ TeV**, *EPJC* 77 (2017) 354, *arXiv:1703.02530*.
- Measurement of double-differential cross sections for top quark pair production in pp collisions at $\sqrt{s} = 8$ TeV and impact on parton distribution functions**, *EPJC* 77 (2017) 459, *arXiv:1703.01630*.
- Search for standard model production of four top quarks in proton-proton collisions at $\sqrt{s} = 13$ TeV**, *Phys. Lett. B* 772 (2017) 336, *arXiv:1702.06164*.

- 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, *JHEP* 07 (2017) 003, arXiv:1702.01404.
- Measurement of the $t\bar{t}$ production cross section using events with one lepton and at least one jet in pp collisions at $\sqrt{s}=13$ TeV, *Submitted to JHEP*, arXiv:1701.06228.
- 2016 Search for CP violation in $t\bar{t}$ production and decay in proton-proton collisions at $\sqrt{s} = 8$ TeV, *JHEP* 03 (2017) 101, arXiv:1611.08931.
- Measurement of the $t\bar{t}$ production cross section using events in the $e\mu$ final state in pp collisions at $\sqrt{s} = 13$ TeV, *EPJC* 77 (2017) 172, arXiv:1611.04040.
- Measurement of the mass difference between top quark and antiquark in pp collisions at $\sqrt{s} = 8$ TeV, *Phys. Lett. B* 770 (2017) 50, arXiv:1610.09551.
- Search for top quark decays via Higgs-boson-mediated flavor-changing neutral currents in pp collisions at $\sqrt{s} = 8$ TeV, *JHEP* 02 (2017) 079, arXiv:1610.04857.
- Measurement of differential cross sections for top quark pair production using the lepton+jets final state in proton-proton collisions at 13 TeV, *Phys. Rev. D* 95, 092001 (2017), arXiv:1610.04191.
- Cross section measurement of t-channel single top quark production in pp collisions at $\sqrt{s} = 13$ TeV, *Accepted by Phys. Lett. B.*, arXiv:1610.00678.
- [Other public documents from top](#)
- 2017 Object definitions for top quark analyses at the particle level, *CMS-NOTE-2017-004*, CERN-CMS-NOTE-2017-004.

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

- 2017 Higgs to WW measurements with 15.2 fb^{-1} of 13 TeV proton-proton collisions, *HIG-16-021*, [C].
- 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](#)
- 2017 **Measurement of the differential $t\bar{t}$ cross section with high- p_T top-quark jets in the all-hadronic channel at $\sqrt{s} = 8$ TeV, TOP-16-018, [R - top].**
- Measurement of the differential cross sections of top quark pair production as a function of kinematic event variables in pp collisions at $\sqrt{s} = 13$ TeV, TOP-16-014, [R - top].**
- Measurement of top quark pair-production in association with a W or Z boson in pp collisions at 13 TeV, TOP-17-005, [R - top].**
- Measurement of the inclusive $t\bar{t}$ cross section at $\sqrt{s} = 5.02$ TeV, TOP-16-023, [R - top].**
- Measurement of the top quark mass with muon+jets final states in pp collisions at $\sqrt{s} = 13$ TeV, TOP-16-022, [R - top].**
- 2016 **Investigations of the impact of the parton shower tuning in Pythia 8 in the modelling of $t\bar{t}$ at $\sqrt{s} = 8$ and 13 TeV, TOP-16-021, [R - top].**
- Combinations of the CMS alternative technique measurements of the top quark mass, TOP-15-012, [R - top].**
- Bounding the top quark width using final states with two charged leptons and two jets at $\sqrt{s} = 13$ TeV, TOP-16-019, [R - top].**
- Measurement of the $t\bar{t} + \gamma$ production cross-section in pp collisions at $\sqrt{s} = 8$ TeV, TOP-14-008, [R - top].**
- Measurement of the jet mass distribution in boosted $t\bar{t}$ production at $\sqrt{s} = 8$ TeV, TOP-15-015, [R - top].**
- 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 multilepton 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 $\sqrt{s} = 8\text{TeV}$** , *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

- Invited speaker at the *Agrupación Astronómica de Madrid (AAM)* Seminar: 'Buscando nueva física en el LHC: qué hay después del Higgs?', March 14 (2017), Madrid, Spain.
- **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).
- Invited speaker at the *Collège du Léman* International Day of Women and Girls in Science, February 10, Geneva (CH) (2017).
- 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].
- *Particle Fever* movie meet and greet in the University of Columbia (NY) (2014).
- Guest speaker at ENP Ferney for gender awareness training (2012).
- Appearance in 'Informativos Telecinco' [link], January 1st, 2017.
- Appearance in the Spanish TV program about science 'El cazador de cerebros', 29 October 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).
- Spanish subtitles for the CMS introduction video, [link].
- Different activities within the Spanish Teacher Programme at CERN (also Swedish).
- CMS guide for the Global Science Opera 'Ghost Particles' (2016).
- 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).
- 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 steering panel of Art@CMS.
- Member of the Royal Spanish Society of Physics (RSEF).
- 🏠 International Fellow of the Explorers Club (Western Europe Chapter).

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