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# Rebeca Gonzalez Suarez

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## Scientific bio

I am a physicist of the ATLAS collaboration at the LHC, formerly CMS. I have been involved in Higgs boson physics since the start of my PhD, covering the search for the Higgs boson in  $WW$  decays; all the way until the observation of  $t\bar{t}H$  in 2018, being the Higgs to  $WW$  subgroup convener. In 2011 I started studying the top quark, becoming the single top subgroup convener after achieving the first observation of single top  $tW$ .

I coordinated the whole Top Quark Physics Analysis Group in CMS from 2016 until 2018, when I left CMS to join the Uppsala ATLAS group after obtaining an individual starting grant. While in CMS, I worked extensively in detector operation, in the DT Muon chambers, and the Silicon Strip Tracker.

Currently I am the [Outreach & Education](#) coordinator in ATLAS, and I was involved in the Hardware Track Trigger (HTT) project for the Phase-II Upgrade. I do this in parallel to searching for the [Dark Sector](#) in final states including top quarks (ANA-EXOT-2019-17). Among other ongoing interests machine learning techniques for high energy physics and long-lived particles in future colliders are my top priorities. Concerning the later I convene both the "Direct discovery potential" working group (WG1-SRCH) of the [ECFA Higgs Factory Study](#) and the BSM Physics Performance group for the [Future Circular Collider \(FCC\)](#).

## Current position

2018- **Researcher, Associate Professor (Docent) since 2020**, at the *Department of Physics and Astronomy, High Energy Physics division, Uppsala University*, funded by an individual Starting Grant from the Swedish Research Council.

## Previous positions

2012-2018 **Adjunct Research Associate**, *University of Nebraska, Lincoln, US*.

2010-2012 **Post-doctoral fellow**, *Vrije Universiteit Brussel (VUB), BE*.

2006-2010 **PhD Student**, *Instituto de Fisica de Cantabria (IFCA), ES*.

## Education

2020 **Docent**, *Eq. to German habilitation (14 January)*, Uppsala University, SE.

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 the SM Higgs Boson in the  $H \rightarrow WW^* \rightarrow 2\mu 2\nu$  decay channel at the CMS experiment of the LHC' [[link](#)]

supervisors Javier Cuevas and Teresa Rodrigo Anoro

## International Collaborations

2018- Member of the ATLAS Collaboration at CERN

2006-2018 Member of the CMS Collaboration at CERN

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## Grants and awards

- 2021 **Carl Tryggers Stiftelse**, *Funding for recruiting a postdoc for 2 years, from the Carl Trygger foundation (CTS 20:1169)*, SE.
- 2021 **TUFF-medel 2022**, *Funding for pedagogic development, from the disciplinary domain of science and technology, Uppsala university, SE.*
- 2020 **Bergstedt prize**, *Bergstedtska priset from the Royal Society of Science in Uppsala, Sweden, for "her contribution to the discovery of the Higgs particle and precision studies of its properties".*
- 2018 **Vetenskapsrådet Starting Grant**, *Swedish Research Council, Individual (VR 2017-05092) 4 years, Uppsala University, SE.*
- 2017 **Future Fellowship Grant**, *Australian Research Council, Individual (FT170100088) 4 years (Declined to move to Uppsala), University of Adelaide, AU.*

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## Coordination and Leadership positions

- **Outreach Coordinator**. Coordinator the Education and Outreach group of the ATLAS Collaboration. Reporting to ATLAS spokesperson team. [2021-2023]
- **Convener** of the BSM Physics Performance group for the Future Circular Collider (FCC). [2022-]
- **Convener of ECFA WG1-SRCH**. Convener of the ECFA Higgs Factory Study - subgroup on direct discovery potential, including Feebly Interacting Particles. [2021-]
- **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]
- **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]

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## Reviewing/Refereeing/Jury duties

- Member of the jury for the first 'ACES-Margarita Salas Award', given to Professor Mercedes Maroto-Valer [link] [2021]
- **Editorial Boards**. Member of an ongoing editorial board in the ATLAS experiment. [2019-]
- **Analysis Review Committees**. Member of 22 internal editorial boards in the CMS experiment, **chair of 6** of them. Most appointed postdoc in this kind of committees in CMS at the time. [2011-2016]
- **Funding panel**. Member of the W&T2 Physics Fellowship panel of the Research Foundation Flanders (FWO). [2022-]
- **External Reviewer** for research grants submitted to different funding programs in Europe (France, Belgium, UK and Republic of Ireland), Asia (Hong-Kong), and Oceania (Australia). [2016-] Latest programs:
  - DP20 Australia 2019
  - FSR Incoming post-doc Fellowships, 2019
  - UK and Republic of Ireland, royal society University Research Fellowship 2020 - University Research Fellowship scheme, 2020
  - DP20 Australia 2020
  - DP Australia 2021
  - STFC Particle Physics Experiment Grant Round: (STFC PPGP Experiment 2021), 2021.
- **Referee**. European Physical Journal C. [2018-]

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## Institutional Responsibilities

- **Department Board**. Member of the Board, Department of Physics and Astronomy, Uppsala University [2022-] [link]
- **Seminar organizer**. Weekly seminars in Nuclear and Particle physics at the Physics and Astronomy Department, Uppsala University [2019-2021] [link]
- Member of the Equal Opportunities Group at the Physics and Astronomy Department, Uppsala [2020]

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## Other responsibilities

- FCC National contact for Sweden [2020-]
- Member of the *Advisory Committee of CERN Users (ACCU)*, representing the Swedish User community [2020-]
- *Coordinator* of the FCC-ee LLP case study. Organizer of the long-lived particles case study within the FCC-ee study. [2020-2022]
- *Contact person*. Monte Carlo Simulation, Higgs to WW subgroup, CMS experiment. [2014-2015]
- *Contact person*. Local reconstruction of the Strip Tracker, CMS experiment. [2011-2012]
- *Contact person*. High Level Trigger for the Strip Tracker, CMS experiment. [2011-2012]

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## Supervision of students

- **PhD supervisor** (Main Supervisor) Olga Sunneborn Gudnadottir, Uppsala University (2019-2023)
- **PhD supervisor** (Co-supervisor) Jonas Steentoft (2020-2024)
- **MSc supervisor**
  - Lovisa Ringaard, Uppsala University (2022) - Ongoing
  - Rohini Sengupta, Uppsala University (2021) - *Towards Vertexing Studies of Heavy Neutral Leptons with the Future Circular Collider at CERN* [link].
  - Olga Sunneborn Gudnadottir, Uppsala University (2019) - *Exploring selections across channels in Dark Matter searches with top quarks at the ATLAS experiment of the LHC* [link].
  - Isis Marina Van Parijs, Vrije Universiteit Brussel (2013) - *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* [link].
- **CERN summer student supervisor** Isis Marina Van Parijs (2012) Ivan Shvetsov (2013)
- Supervisor of multiple project students (2018-)

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## Teaching

### University courses:

- 2019- **Modern Physics (5.0c) [1TE078]**, *Examiner and Teacher: lectures, problem solving sessions, exam*, First cycle, Department of Materials Science and Engineering, Uppsala University, SE.
- 2021- **Advanced Particle Physics (10.0c) [1FA355]**, *Teacher: lectures, assignments, seminar, exam*, Second cycle, Department of Physics and Astronomy, Uppsala University, SE.
- 2021/2022 **Application-Oriented Deep Learning in Physics [5.0c]**, *Guest lecturer: 'Machine learning for particle physics at the LHC'*, Freestanding course, Department of Physics and Astronomy, Uppsala University, SE.

### Schools:

- 2021 **COST Advanced School on Physics of Dark Matter and Hidden Sectors: from Theory to Experiment**, *Organizer and Teacher: Non-standard collider signatures: long-lived particles*, (18-21 October) Hybrid format - Lund University, SE.
- 2019 **Hadron Collider Physics School (HASCO) 2019**, *Teacher: Introduction*, (21- 26 July) University of Goettingen, DE.
- 2019 **Partnership for Innovation, Education and Research (PIER) Graduate Week**, *Speaker: Scientific colloquium*, (23 - 26 Sep) DESY, Hamburg, DE.

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## Formal pedagogic training

- **Hands-on: renew your online teaching** - 2021, Uppsala University (SE). (**6 hours**).
- **Supervising Students for Degree Projects** - 2019, Uppsala University (SE). (**2 weeks**).
- **Academic Teacher Training Course** - 2018, Uppsala University (SE). (**5 weeks**).
- **Supervising PhD Students** - 2018, Uppsala University (SE). (**3 weeks**).
- **Supervising student presentations - in theory and in practice** - 2018, Uppsala University (SE). (2,5 days).
- **Student-centered teaching and learning** - 2018, Uppsala University (SE). (3 hours).

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## Participation in Thesis Boards

- 2021 **PhD thesis committee** (reserve) (23rd - September) Universidad de Oviedo, ES 'Study of beyond the Standard Model processes in leptonic final states with the CMS detector at the Run II of the LHC' by Carlos Erice.
- 2020 **PhD thesis committee** (11th - December) Lund University, SE 'Study of  $\Xi$ -Hadron Correlations in  $pp$  Collisions at  $\sqrt{s}=13$  TeV Using the ALICE Detector' by Jonatan Adolfsen **ALICE thesis award**.
- 2020 **Licentiate thesis Reader** (18th - November) Stockholm University, SE 'b-jet identification and searches for supersymmetry, dark matter and Higgs boson pair production with the ATLAS experiment' by Laura Pereira Sánchez [link].
- 2020 **PhD thesis committee** (reserve) (11th - September) Universidad de Oviedo, ES 'Search for new physics in events with high transverse momentum leptons with the CMS detector at the LHC' by Sergio Sanchez Cruz.
- 2019 **External Examiner at viva** (15th - September) University of Glasgow, UK 'Boosting to the Top: Measurements of Boosted Top Quarks and Higgs Bosons with the ATLAS Detector at the Large Hadron Collider' by Michael James Fenton.
- 2019 **PhD thesis committee** (13th - September) Universidad de Oviedo, ES 'Study of processes with a pair of top-antitop Quarks and missing transverse energy in the final state in proton-proton collisions with the CMS detector at the Run 2 of the LHC' by Juan Rodrigo Gonzalez Fernandez.
- 2018 **PhD thesis committee** (13th - December) Uppsala University, SE 'Isomeric yield ratio measurements with JYFLTRAP: In quest of the angular momentum of the primary fragments' by Vasileios Rakopoulos. **Chair person** of the examination committee.
- 2018 **PhD thesis committee** (9th November - 18th December) Bristol University, UK; and Vrije Universiteit Brussel, BE 'Precision measurements of differential  $t\bar{t}$  production cross sections as a function of kinematic event variables at 13 TeV at CMS' by Douglas John Paul Burns.
- 2018 **PhD thesis committee** (12th October) Uppsala University, SE 'Enhancing the performance of the Digital Cherenkov Viewing Device - Detecting partial defects in irradiated nuclear fuel assemblies using Cherenkov light' by Erik Branger.
- 2018 **PhD thesis committee** (19th March) Vrije Universiteit Brussel, BE 'Direct measurement of the top quark decay width in the muon+jets channel using the CMS experiment at the LHC' by Lieselotte Moreels.
- 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.
- 2011 **PhD thesis committee** (reserve) (23 April) Universidad Complutense de Madrid, ES 'Measurement of the inclusive production cross-section of W bosons in proton-proton collisions at  $\sqrt{s}=7$  TeV in the CMS experiment at the LHC' by Maria Cepeda Hermida

## Seminars

- 2021 **Physics Colloquia - University of Exeter**, 'Staying alive? - New physics at the LHC and beyond', (October 29), Exeter, UK.  
**University of Siegen**, 'Long-lived particles at the FCC-ee', (May 4), Siegen, DE.
- 2020 **Virtual Colloquium at the Physics and Astronomy Department of Michigan State University**, 'Staying Alive - New Physics at the LHC and beyond', (October 29), Michigan, US.  
**Helsinki Institute of Physics**, 'Long live the Large Hadron Collider', (May 5), Helsinki, FI.
- 2019 **Université Catholique de Louvain**, 'A Hardware Track Trigger for ATLAS at the HL-LHC', (October 24), Louvain-la-Neuve, BE.  
**University of Texas at Austin**, 'A Hardware Track Trigger for ATLAS at the HL-LHC', (July 15), Austin TX, US.
- 2018 **Uppsala University**, 'At the top of the Large Hadron Collider', (September 6), Uppsala, SE.
- 2017 **Workshop on top physics at the LC 2017**, 'Recent LHC results', (June 8), CERN, CH.  
**University at Albany**, 'It is not lonely at the top: studying the heaviest quark at the LHC', (February 16), Albany, NY, US.

- University of Kansas**, *'It is not lonely at the top: studying the heaviest quark at the LHC'*, (January 23), Lawrence, KS, US.
- 2016 **University of Zurich**, *'Top quark physics in Run 2 with the CMS experiment'*, (December 5), Zurich, CH.
- UK HEP Forum**, *'Top physics'*, (November 3), Abingdon, UK.
- Teilchenkolloquium - Particle Physics Colloquium at University of Heidelberg**, *'Top quark physics at 13 TeV with the CMS experiment at the LHC'*, (July 5), Heidelberg, DE.
- 2015 **Stony Brook University**, *'Top quark and Higgs boson physics at the LHC'*, (December 17), Stony Brook, NY, US.
- Wine & Cheese: Fermilab Joint Experimental - Theoretical Physics Seminar**, *'Recent Results from CMS on Top and Higgs'*, (November 20), Fermilab Batavia, IL, US.
- LPC Physics Forum**, *' $H \rightarrow WW$  at CMS'*, (August 13), Fermilab Batavia, IL, US.
- University of Nebraska, Lincoln**, *'Higgs boson decays to  $WW$  at CMS'*, (August 10), Lincoln NE, US.
- University of Goettingen, II. Physikalisches Institut**, *'Overview of single top physics in CMS with Run-1 data'*, (June 19), Goettingen, DE.
- Université Catholique de Louvain**, *'Is it the Higgs? Characterization of the  $H(125)$  resonance (spin, parity, tensor structure) with leptonic  $WW$  decays'*, (March 18), Louvain-la-Neuve, BE.
- EPFL Lausanne**, *'Overview of single top physics in CMS with Run-1 data'*, (March 2), Lausanne, CH.
- 2014 **CERN Collider Cross Talk**, *' $H \rightarrow WW$  from ATLAS and CMS'*, (November 27), CERN, CH.
- LHC seminar**, *'Recent top physics results from CMS'*, (February 25), CERN, CH.
- 2013 **Uppsala University**, *'Overview of single top results at the LHC'*, (October 10), Uppsala, SE.

## International Conferences and Workshops

- 2021 **DISCRETE 2020-2021: 7th Symposium on Prospects in the Physics of Discrete Symmetries**, *Invited Plenary talk: "The Future Circular Collider (FCC) at CERN"*, 29 November - 3 December) Bergen, NO.
- Nordic physics Days 2021**, *Chair of session: Elementary particle physics and astroparticle physics 1*, Talk: *"Long-lived particles at FCC-ee"*, 4-6 August Uppsala - held virtually, SE.
- FCC Week 2021**, *Invited Talk: "Long-lived particles at FCC"*, 30 June CERN - held virtually, CH.
- 1st FCC Nordic day**, *Chair of the workshop, main organizer*, Talks: *"Welcome and Information"* and *"Long-Lived particles at the FCC-ee"*, 22 March Uppsala - held virtually, SE.
- XIX International Workshop on Neutrino Telescopes**, *Parallel Talk: "Heavy neutrino searches at the FCC"*, 18-26 February Padova - held virtually, IT.
- XXVII Cracow EIPHANY Conference on Future of particle physics**, *Invited Plenary Talk: "Long-lived particles at future colliders"*, 7-10 January Cracow - held virtually, PL.
- 2020 **Searching for long-lived particles at the LHC: Eighth workshop of the LHC LLP Community**, *Organizing committee and chair of sessions: Long-lived particles at future colliders and New ideas 3*, 16-20 November, held virtually.
- 4th FCC Physics and Experiments Workshop**, Talk: *"Long Lived Particles at FCC-ee" and "Beyond the Standard Model physics at FCC: complementarity with astrophysics and non-collider experiments"*, 10-13 November, held virtually.
- ICHEP2020: 40th International Conference on High Energy Physics**, *Moderator of the discussion session for Plenary II: High-Energy Cosmic Particles and Dark Matter*, 28 Jul - 6 Aug, Prague - held virtually, CZ.
- Searching for long-lived particles at the LHC: Seventh workshop of the LHC LLP Community**, *Organizing committee and chair of session: "Triggering ideas for ATLAS and CMS and a new result from CMS"*, 25-27 May, CERN - held virtually, CH.

- Spaatind 2020: The 26th Nordic Particle Physics Meeting**, *Talk: 'To catch a long-lived particle'*, 2-7 Jan, Skeikampen, NO.
- 2019 **Searching for long-lived particles at the LHC: Sixth workshop of the LHC LLP Community**, *Organizing committee and chair of the trigger session*, 27-29 Nov, Ghent, BE.
- 2018 **CHARGED2018: Prospects for Charged Higgs Discovery at Colliders**, *Organizing committee and chair of the proceedings*, 25-28 Sep, Uppsala, SE.
- IMFP 2018 - XLVI International Meeting on Fundamental Physics**, *Invited Talk: "Top Quark Physics Summary"*, (9-13 April), Salamanca, ES.
- Aspen 2018 - The Particle Frontier**, *Plenary Talk: "LHC results on Top Quark Physics"*, (25-31 March), Aspen, CO, US.
- Top Quark Physics at the Precision Frontier**, *Chair of the workshop*, (16-19 Jan), Fermilab Batavia, IL, US.
- 2017 **Top! Hammertime (a CMS top quark workshop)**, *Chair of the workshop*, (14-15 Nov) CERN, CH.
- TOP2017: 10<sup>th</sup> International Workshop on Top Quark Physics**, *Member of the International Advisory Committee and Chair of the session: Differential Top Quark Pair Production*, (17-22 Sep), Braga, PT.
- 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 **top at 100fb<sup>-1</sup>**, *Chair of the workshop*, (8-9 Nov) CERN, CH.
- 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.

## Publications

- Author of the ATLAS Collaboration since November 2019, author of the CMS Collaboration papers from 2007 to 2019. Full publication list available [here].
- During my two years as top quark Physics Analysis Group coordinator at the CMS experiment [2016-2018]:
  - **53 results were made public, of which 32 were articles submitted to journals.**
  - 6 more papers reflecting analyses I followed up were submitted to journals shortly after.
  - About 35% of the total publications of the top quark group in CMS were submitted.
  - I was the 12th convener of the group
  - Complete list of results is available in this [link].
- During my Higgs to WW sub-convenership [2014-2016], 2 papers were submitted to journals: arXiv:1606.01522-JHEP 03 (2017) 032 which was the **500<sup>th</sup> paper of CMS**, and arXiv:1605.02329-JHEP 09 (2016) 051, as well as seven preliminary results.
- During my single top quark sub-convenership [2012-2013], 7 papers were submitted to journals, and 10 preliminary results made public.

## Analysis Contact, Primary Author, Editor

- 2021 **Hunt for rare processes and long-lived particles at FCC-ee**, arXiv:2106.15459, Eur. Phys. J. Plus 136, 1056 (2021).
- 2020 **Snowmass2021 - Letter of Interest**, *Searches for Long-Lived Particles at the FCC-ee*.
- 2019 **To catch a long-lived particle: hit selection towards a regional hardware track trigger implementation**, arXiv:1907.09846, JINST 14 P11009 (2019).
- 2017 **Recent CMS results in top and Higgs physics**, arXiv:1707.05054, Modern Physics Letters A, 2, Vol. 32, No. 29 (2017) 1730026.
- 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).
- 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 (2014)..  
**Measurement of Higgs boson production and properties in the WW decay channel with leptonic final states**, arXiv:1312.1129, JHEP 01(2014)096.
- 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).

## Substantial 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.
- 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.  
**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.
- 2013 **Snowmass 2013 Top quark working group report**, arXiv:1311.2028.

- 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.
- 2012 **Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC**, *arXiv:1207.7235*, Phys.Lett. B 716 (2012) 30-61.
- 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.
- 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. D 84 (2011) 092004.
- 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.
- Conference Proceedings**
- 2021 **Long-Lived Particles at Future Colliders**, *Proceedings for the XXVII Epiphany Conference*, *arXiv:2102.07597*, Acta Phys. Pol. B 52, 953 (2021).
- 2015 **Run-1 Single top measurements at CMS**, *Proceedings DPF 2015*, *arXiv:1510.05235*.
- 2014 **Inclusive single top cross section at the LHC**, *Proceedings TOP 2013*, DOI:10.3204/DESY-PROC-2014-02/16.
- 2012 **Single top Production at  $\sqrt{s} = 7$  TeV**, *Proceedings Moriond 2012*, *arXiv:1205.2786*.
- 2010 **Higgs search prospects at the LHC**, *Proceedings BEACH 2010*, Nucl.Phys.Proc.Suppl. 210-211 (2011) 283-288.
- 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*.
- 2007 **A Software and Computing prototype for CMS Muon System alignment**, *Proceedings CHEP 2007*, Journal of Physics: Conference Series 119 (2008) 072008.

## Selected Outreach Activities

Very active outreach and science communication profile, an extended (though incomplete) list of my activities can be found [here].

Latest: Speaker and Q&A session for “Conversaciones con los/las Científicos/as” a part of *Gijón con Ciencia: Programa de Divulgación Científica*, FMCE and UP Gijón/Xixón (Oct. 20 2021).

- Personal **Twitter** account “*1cRebeca*” used for outreach and science communication. Curated rotating accounts, such as *emphlamSciComm* (23K+ followers, Sep. 2019) [link].
- **ATLAS Social media engagement officer**, running the official ATLAS experiment Instagram account [link] (2020).
- **Official CERN, ATLAS, 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: 2013-2015.
- **Local Organizer** of the International Masterclasses by the International Particle Physics Outreach Group (IPPOG) at Uppsala University (2020).
- **Moderator** of the International Masterclasses by the IPPOG (2015-2017).
- CERN speaker for the International Day of Women and Girls in Science, Geneva (CH) (2017-2018).
- Public lectures, Q&A sessions, meet and greet. Interviews in radio, TV, newspapers, magazines.
- Features, latest: LHC Physics at Ten in the CERN official website.
- CERN official videos: Facebook Live from the LHC tunnel [link], February 2018; April Fools' Day video [link] (2016); or official CERN LHC Season 2 videos [link] (2015) among others.
- Different activities within the Spanish, Mexican, and Swedish High School Teacher Programmes at CERN.
- Contributions to the IPPOG website and to different blogs, including a personal blog with CERN pictures, *lonelychairsatcern.tumblr.com* (20K followers).
- Member of the steering panel of Art@CMS [2017-2018]

## Other Activities

**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** (2012-2017) shifts, and **Run Field Manager** (2015-2017)

#### Panel participation:

- ICHEP2020: 40th International Conference on High Energy Physics, **Moderator** of the discussion session for Plenary II: High-Energy Cosmic Particles and Dark Matter (link) [2020].
- LHC Soft skills workshop: making the best of working from home (link) [2020].
- 103rd Plenary ECFA meeting at CERN (link) [2018].
- Spanish teacher program at CERN [2017].

#### Membership of Scientific Societies:

-  International Fellow of the Explorers Club (Swedish Chapter) (2016). **Board Member, Membership chair.**
- Member of the Uppsala Society for Women Scientists.
- Member of ACES: Asociación de Científicos Españoles en Suecia.
- Member of the Swedish Physics Society (Svenska Fysikersamfundet).
- Member of the Royal Spanish Society of Physics (RSEF).
- Part of the Dark Machines collective.

#### Not scientific, but still noteworthy

- Participant in the performance: 'Marina Abramovic MAI presents: Counting the Rice' (2014) Centre d'Art Contemporain Genève in a site-specific structure designed by Daniel Libeskind and produced by Moroso.
- Member of the 'Jurado Joven', 44 edition of the Gijón Film Festival (2006).
- Co-creator and spokesperson of 'MEAL (MEatball AcceLerator)', 2019 Stupid Hackathon Sweden.

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