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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.

I was the [Outreach & Education](#) coordinator in ATLAS (2021-2023), and I was involved in the Hardware Track Trigger (HTT) project for the Phase-II Upgrade.

My group searches for a new [dark sector](#) in final states including top quarks (ATLAS-CONF-2023-021). 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 European Committee for Future Accelerators (ECFA) [Higgs Factory Study](#) and the BSM Physics Performance group for the [Future Circular Collider \(FCC\)](#).

## Current position

2023- **Senior Lecturer/Associate Professor, Universitetslektor Docent**, at the Department of Physics and Astronomy, High Energy Physics division, Uppsala University, Sweden

## Previous positions

2018-2023 **Researcher**, Uppsala University, SE

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

2024- Member of the FCC International Collaboration

2018- Member of the ATLAS Collaboration at CERN

2006-2018 Member of the CMS Collaboration at CERN

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## Grants and awards

- 2023 **Vetenskapsrådet Project Grant**, Swedish Research Council, Individual (VR 2023-03403) 4 years, Uppsala University, SE  
**Ai4Research**, Awarded research project in artificial intelligence and machine learning 2024, Uppsala university, SE
- 2022 **i-LINK Grant**, Co-applicant in international network grant for cooperation and travel (ILINK22043), ES
- 2021 **TUFF-medel 2022**, Funding for pedagogic development, from the disciplinary domain of science and technology, Uppsala university, SE
- 2021 **Carl Tryggers Stiftelse**, Funding for recruiting a postdoc for 2 years, from the Carl Trygger foundation (CTS 20:1169), 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

- **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-]
- **Outreach Coordinator**. Activity Coordinator the Education and Outreach group of the ATLAS Collaboration. Reporting to ATLAS spokesperson team. Elected. [2021-2023]
- **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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## Institutional Responsibilities - Uppsala University

- **Department Board**. Member of the Board, Department of Physics and Astronomy, elected [2022-2024]
- **Elektorsförsamling 2023-2025 för Teknat**. Electoral Assembly within the Faculty of Science and Technology, elected, personal alternate [2023-2025]
- **Seminar organizer**. Weekly seminars in Nuclear and Particle physics [2019-2021]
- Member of the Equal Opportunities Group at the Physics and Astronomy Department [2020]

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## Board/Committee participation

- Member of the **Collaboration Board Chair Advisory Group (CBCAG)**, ATLAS Collaboration [2024-]
- Member of the **Group of Experts for the ATLAS Outstanding Achievements Award** evaluation, as former Activity Coordinator [2024]
- Member of the Search Committee for the ATLAS Spokesperson election [2024]
- Plenary **ECFA Country delegate** for Sweden [2024-]
- FCC National contact for Sweden [2020-]
- Member of the **Advisory Committee of CERN Users (ACCU)**, representing the Swedish User community [2020-]
- Member of the board of the section for Elementary and Astroparticle Physics of the Swedish Physical Society (*Svenska Fysikersamfundet, Sektionen för elementarpartikel och astropartikelfysik*). [2023-]
- Member of the board of the exterior section of the Spanish Physical Society (*Real Sociedad Española de Física*)

(RSEF) - sección exterior) [2023-]

- ATLAS Representative at the International Particle Physics Outreach Group (IPPOG) collaboration board [2022-2023]

## 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 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 a Physics Fellowship panel of the Research Foundation Flanders (FWO). Junior & Senior postdoctoral fellowship applications: W&T2PD - Physics. [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) since 2016. In the last five years:
  - GRF Hong Kong, 2022, 2024
  - DP24 Australia, 2023
  - STFC Particle Physics Experiment Grant Round: (STFC PPGP Experiment 2021), 2021.
  - DP Australia, 2021
  - DP20 Australia, 2020
  - UK and Republic of Ireland, Royal Society University Research Fellowship 2020 - University Research Fellowship scheme, 2020
  - DP20 Australia, 2019
  - FSR Incoming post-doc Fellowships, 2019
- **Referee.** Physical Review D (PRD) [2024-], Journal of High Energy Physics (JHEP) [2024-], European Physical Journal C (EPJC) [2018-].
- Poster session chair. CMS week in Brussels. [2011]

## Participation in Recruitment committees

- (2022) - The Niels Bohr Institute, Faculty of Science, University of Copenhagen. (211-0435/22-2E) Fixed-term Associate Professor of Quantum Science Education.
- (2022) - Department of Physics and Astronomy Uppsala University. (UVF-PA 2022/2541) Postdoktor inom experimentell hadronfysik.
- (2022) - Department of Physics and Astronomy Uppsala University. (UFV-PA 2022/2209) Doktorand i experimentell hadronfysik.

## Other responsibilities

- **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]

## 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]**, **Course responsible**, *Teacher*, Second cycle, Department of Physics and Astronomy, Uppsala University, SE
- 2024- **Advanced Physics - Project Course (10.0c) [1FA565]**, *Examiner*, Second cycle, Department of Physics and Astronomy, Uppsala University, SE
- 2024- **Advanced Physics - Project Course (5.0c) [1FA566]**, *Examiner*, Second cycle, 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

## 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).

## Supervision of students

- **PhD students**
  - (Main Supervisor) Axel Gallén (2023-)
  - (Main Supervisor) Olga Sunneborn Gudnadottir (PhD May 2024)
  - (Visiting student) Baibhab Pattnaik, from University of Valencia (2023)
  - (Co-supervisor) Christina Dimitriadi (PhD May 2024)
  - (Co-supervisor) Jonas Steentoft (*Lic.* 2022)
- **MSc**
  - Eva Mayer (2023)
  - Lovisa Rygaard (2022)
  - Rohini Sengupta (2021)
  - Olga Sunneborn Gudnadottir (2019)
  - Isis Marina Van Parijs (2013)
- **CERN summer student supervisor** Isis Marina Van Parijs (2012) Ivan Shvetsov (2013)
- Supervisor of multiple project students (2018-)

## Participation in Thesis Boards

- 2024 **External Referee for PhD thesis** (*January*) University of Zurich, CH '*Searches for New Physics in Top-Antitop Associated Production Processes and Mechanical Design and Thermal Performance of the CMS Inner Tracker Endcap Pixel Upgrade*' by Sascha Liechti.
- 2023 **PhD thesis committee** (*15th - December*) Uppsala University, SE '*Isomeric yield ratios in nuclear fission*' by Zhihao Gao. **Chair** of the examination committee.
- 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 Adolfsson **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** 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

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## Seminars

- 2023 **Seminar at the Solid State physics division of the Department of Materials Science and Engineering, Uppsala University**, '*Why do we need to go beyond the standard model at particle colliders and how to do it?*', (October 26), Uppsala, SE
- Helsinki Institute of Physics, cosmology seminar**, '*Dancing in the dark: exploring dark sectors at particle colliders, present and future*', (September 6), Helsinki, FI
- 2022 **Oskar Klein Centre Colloquium**, '*Staying alive after the LHC*', (March 8), Stockholm, SE
- 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

## Conferences, Workshops, Other

- 2024 **RECFA visit to Sweden**, *Organizing committee*, talk: "*Future Colliders*", (16 May) Lund, SE
- Young Nordic Future-Collider day / FCC discussion**, *Chair of the FCC discussion*, talk: "*Short status of the FCC project from a Swedish angle*", (14 May) Lund, SE
- Celsius-Linnaeus Lectures**, *Uppsala Celsius symposie-lecturer*: "*Searches for physics beyond the Standard Model at the high energy frontier*", (15 Feb) Uppsala, SE
- 7th FCC Physics Workshop**, *Talk*: "*Report from Sweden, Norway, Denmark, Finland, Baltic countries*", (29 Jan - 2 Feb) Annecy, FR
- ZPW2024: Particle Physics from LHC to Future Colliders**, *Invited talk*: "*The FCC project overview*", (8-10 Jan) Zurich, CH
- 2023 **ICFA Seminar 2023: 13th ICFA Seminar on Future Perspectives in High-Energy Physics**, *Swedish representative - invitation only*, (27 Nov - 1 Dec) DESY Hamburg, DE
- Electroweak milestones - 50 years of neutral currents, 40 years of W and Z bosons**, *Invited talk*: "*A forward look (FCC-ee)*", (31 October) CERN, CH
- Second ECFA Workshop on e<sup>+</sup>e<sup>-</sup> Higgs/EW/Top Factories**, *Chair of WG1-SRCH sessions and talk*: "*LLPs - Long-lived particles*", *ECR Panel discussion*, (11-13 October) Paestum, IT
- Nobel Symposium on Dark Matter - NS 182**, *Invited local participant*, (24-29 August) Rånäs Slott, SE
- The 2023 International Workshop on Circular Electron Positron Collider (European Edition)**, *Chair the Parallel sessions "Physics: BSM"*, (3-6 July) Edinburgh, UK
- Fysikdagarna 2023**, *Talks*: "*ACCU*" and "*The Future Circular Collider (FCC) at CERN*", (14-16 June) Stockholm, SE
- CHIPP/CHART Workshop on Sustainability in Particle Physics and CHIPP 2023 plenary**, *Invited plenary talk*: "*Physics motivation for future colliders*", (14-16 June) Sursee, CH
- FCC Week 2023**, *Chair of session: PE&D: Detectors (I)*, (5-9 June) London, UK
- Blois 2023: 34th Rencontres de Blois on "Particle Physics and Cosmology"**, *Invited Plenary talk*: "*Long lived particles (at colliders and beyond)*" and *chair of the BSM parallel session Thursday afternoon*, (14-19 May) Blois, FR
- HEP2023: 8th International Conference on High Energy Physics in the LHC Era**, *Plenary talk*: "*Overview of Physics results at ATLAS*", (9-13 January) Valparaíso, CL
- 2022 **First ECFA workshop on e<sup>+</sup>e<sup>-</sup> Higgs/EW/Top Factories**, *Abstract selection and indico agenda for the "WG1 - Searches" sessions*, (5-7 October) Hamburg, DE

- FCC BSM Physics Programme Workshop**, Organizing committee and chair, (15-16 Sept) CERN, CH
- FCC Week 2022**, *Invited talk: "BSM Review and Plans", Introduction and participation in: "FCCIS WP5 Sharpening the FCC Physics Case: Round table discussion", (30 May 2022 - 3 June 2022)* Paris, FR
- ECFA HF WG1: 1st Workshop of the WG1-SRCH group**, Chair of the workshop, (25 May) CERN - held virtually, CH
- The 2nd Joint ECFA-NuPECC-ApPEC JENAS-Seminar**, *Invited Plenary talk: "Outreach" and panel: "Training, Education, and Outreach", 3-6 May)* Madrid, ES
- 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
- Partikeldagarna 2021**, *Talk: "Report from ACCU", 22-23 November* Chalmers - held virtually, SE
- 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", 28 Jun - 2 Jul* 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-autor): "A software and computing prototype for CMS Muon system alignment"*, (2-7 Sep), Victoria BC, CA

## Panel participation

- Second ECFA Workshop on e+e- Higgs/EW/Top Factories, ECR Panel discussion (link) [2023].
- FCC Week 2022, panel: "FCCIS WP5 Sharpening the FCC Physics Case: Round table discussion" (link) [2022].
- The 2nd Joint ECFA-NuPECC-ApPEC JENAS-Seminar, panel: "Training, Education, and Outreach" [2022].
- ATLAS Sweden Day partikeldagarna, panel discussion on career system in our field (link) [2021].
- 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].

## 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.
  - 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

- 2024 **Search for dark mesons decaying to top and bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector**, arXiv:2405.20061, Submitted to JHEP
- 2024 **Sparks in the Dark**, arXiv:2404.04138, Submitted to CSBS
- Focus topics for the ECFA study on Higgs / Top / EW factories**, arXiv:2401.07564
- 2022 **Searches for Long-Lived Particles at the Future FCC-ee**, arXiv:2203.05502, Front. Phys. 10:967881 (2022)
- 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  $\sqrt{s} = 8$  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

- 2022 **Report of the Topical Group on Physics Beyond the Standard Model at Energy Frontier for Snowmass 2021**, arXiv:2209.13128, Snowmass 2022 process
- The Present and Future Status of Heavy Neutral Leptons**, arXiv:2203.08039, Snowmass 2022 process
- The Future Circular Collider: a Summary for the US 2021 Snowmass Process**, arXiv:2203.06520, Snowmass 2022 process
- 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  $\sqrt{s} = 8$  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](#)
- 2022 **The Future Circular Collider (FCC) at CERN**, *Proceedings for the 7th Symposium on Prospects in the Physics of Discrete Symmetries (DISCRETE 2020-2021)*, *arXiv:2204.10029*
- 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

## Computing projects

- Credit award - Google Cloud Research Credits for machine learning. PI: Rebeca Gonzalez Suarez [2022-2023] - PI
- (NAISS 2023/6-215) NAISS Medium Storage **ATLAS Sweden Grid Storage** PI: Oxana Smirnova Swestore [2023-08-25 to 2024-09-01] - member
- (SNIC 2022/6-257) SNIC Medium Storage **Search for Dark Mesons in ATLAS** PI: Rebeca Gonzalez Suarez [2022-10-01 to 2023-10-01] - PI
- (SNIC 2021/6-82) SNIC Medium Storage **Search for Dark Mesons in ATLAS** PI: Rebeca Gonzalez Suarez [2021-04-01 to 2022-10-01] - PI
- (SNIC 2020/22-2) SNIC Medium Storage **Search for Dark Mesons in ATLAS** PI: Rebeca Gonzalez Suarez [2020-03-04 to 2021-04-01] - PI
- (HPC2N) SNIC Medium Compute **Particle Physics at the High Energy Frontier** PI: Christian Ohm [2019-02-01 to 2019-10-01] - member

## Selected Outreach Activities

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

Latest: Storyteller at the 'Evening event: Science Showcase – at Stadshallen' within the **CERN 70 Swedish outreach tour** [\[link\]](#) (15 May 2024).

- Member of the IPPOG Collaboration Author List 2024.

- 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

### ATLAS detector operation tasks:

- Run Control Shifter (2024), Trigger Shifter (2024).


### 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)

### Other Trainings:

- Ekonomispelet for Research Leaders (3 October 2023; Uppsala University).
- CERN: Dealing With Media Questions (April 22, 2021; facilitated by Inside Edge Media Training).
- Communication Training (February 2011; CERN)

### Membership of Scientific Societies:

-  International Fellow of the Explorers Club (Swedish Chapter) (2016). Board Member, Membership chair [2020-2023].
- 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 board** [2024-].
- Member of the Royal Spanish Society of Physics (RSEF). **Member of the board of the external section** [2024-].
- 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.

July 28, 2024