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# Rebeca Gonzalez Suarez

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## Scientific bio

I was involved in Higgs boson physics since the start of my PhD, covering the [search for the Higgs boson](#) all the way to the observation of  $t\bar{t}H$  in 2018. I was the Higgs to WW subgroup convener in the CMS experiment 2015/16. In 2011 I started studying top quarks, becoming the single top subgroup convener in 2013 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 with an individual starting grant.

While in CMS, I worked in detector operation, in the DT Muon chambers, and the Silicon Strip Tracker. In ATLAS, I coordinated the [Outreach & Education](#) activity, and was involved in the Hardware Track Trigger for the Phase-II Upgrade.

Currently, my group searches for [dark sectors](#) in unconventional final states, including [long-lived particles](#). Beyond this, [machine learning](#) techniques for high energy physics and the new physics reach of [future colliders](#) are my top priorities. Concerning the later I convene BSM groups for the [\(ECFA\) Higgs Factory Study](#) and within the Physics Performance group for the [Future Circular Collider \(FCC\)](#). In 2024 I was selected to be the [BSM physics working group convener for the next Update of the European Particle Physics Strategy](#).

## 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

Ongoing:

- **Convener** of the BSM physics working group for the Update of the European Particle Physics Strategy [2024 - 2026]
- **PI** of the high energy physics eSSANCE program, Uppsala University. [2024-]
- **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-]

Former:

- **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 **International Organizing Committee of the Higgs conference** (representative of the Future Accelerators experiments) [2025-2027]
- Plenary **ECFA Country delegate** for Sweden [2024-]
- FCC National contact for Sweden [2020-]
- Member of the **Advisory Committee of CERN Users (ACCU)**, representing Sweden [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-]
- 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]
- ATLAS Representative at the International Particle Physics Outreach Group (IPPOG) collaboration board [2022-2023]

## Reviewing/Refereeing/Jury duties

- **Editorial Boards.** Member of 2 editorial boards 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 Physics Fellowship panel of the Research Foundation Flanders (FWO). Junior & Senior postdoctoral fellowship applications: W&T2PD - Physics. [2022-2024]
- *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.
- **Referee.** Physical Review D (PRD) [2024-], Journal of High Energy Physics (JHEP) [2024-], European Physical Journal C (EPJC) [2018-].
- Poster sessions: CMS week (**chair**) [2011]; LHCP (jury member) [2024]; ECFA workshop (jury member) [2024].
- Member of the jury for the first 'ACES-Margarita Salas Award' [link] [2021]

## 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
- 2024- **Project in Physics and Astronomy (30.0 c) [1FA193]**, *Examiner*, 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
- 2021-2024 **Advanced Particle Physics (10.0c) [1FA355]**, **Course responsible**, *Teacher*, 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:

- 2025 **12th KSETA plenary workshop**, *Invited lecture: The Future Circular Collider (FCC) at CERN*, (10-12 March) Haus Saron in Wildberg, DE
- 2024 **PSI Particle Physics Summer School: From Low to High: Particle Physics at the Frontier**, *Teacher: The Standard Model and Beyond*, (4-10 August) Zuz, CH
- 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 **PhD thesis committee** (14th - November) Institut Polytechnique de Paris (ED IP Paris), FR 'Search for resonant Higgs boson pair production in the  $b\bar{b}\tau\tau$  decay channel and developments in the reconstruction of High Granularity Calorimeter trigger primitives with the CMS detector at the LHC' by Bruno Alves. **Rapporteure (referee)**.
- PhD thesis committee** (27th - September) Uppsala University, SE 'Analysis of Gamma and Neutron Emission for Predicting Decay Heat in Spent Nuclear Fuel' by Virginie Solans. **Chair** of the examination committee.
- 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 Adolfsen **ALICE thesis award**.  
**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].  
**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.  
**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.  
**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.  
**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.  
**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

- 2025 **Laboratory for Particle Physics Colloquium, Paul Scherrer Institute (PSI)**, '*Beyond the Standard Model Searches at present and Future Colliders*', (February 27), Villigen, CH
- 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

- 2025 **8th FCC Physics Workshop**, Talk: "Nordic+Baltic countries", (13-17 Jan) CERN, CH
- Spåttind 2025: The 28th Nordic Particle Physics Meeting**, Invited talk: "Future Circular Collider (FCC)" and panel discussion, (2-7 January) Skeikampen, NO
- 2024 **XVI CPAN DAYS**, Invited talk: "Physics cases for Future Colliders", (19-21 November) Madrid - given virtually, ES
- HIGGS 2024**, Program committee, local organizing committee, chair of the closing session, (4-8 November) Uppsala, SE
- ATLAS/FCC Sweden day**, Chair, talk: "Talking points", (23 October) Uppsala, SE
- Partikeldagarna 2024**, Organizing committee, talk: "News from ACCU", (21-22 October) Uppsala, SE
- 3rd ECFA workshop on e+e- Higgs, Electroweak and Top Factories**, Chair of the BSM sessions, member of the jury for the poster session, plenary talk: "Searches for LLPs", (9-11 October) Paris, FR
- LHCP 2024: 12th Edition of the Annual Large Hadron Collider Physics conference**, Chair of the Outreach and Education sessions, member of the jury for the poster session, (3-7 June) Boston, US
- 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
- Spätind 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

- Spåtind, Strategy discussion - Panel discussion (link) [2025].
- 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, the 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.

## Selection of Personal Publications

- 2024 **Searching for long-lived dark scalars at the FCC-ee**, *arXiv:2412.10141*
- Leptophilic Z' bosons at the FCC-ee: discovery opportunities**, *arXiv:2410.12903*

- 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*, JHEP 09 (2024) 005
- Sparks in the Dark**, *arXiv:2404.04138*, SciPost Phys. 18, 080 (2025)
- Focus topics for the ECFA study on Higgs / Top / EW factories**, *arXiv:2401.07564*
- 2023 **FCC Midterm Report - 8. Physics & Experiments**, *Editing/convener BSM topics*, <https://doi.org/10.17181/mhas5-1f263>
- 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*, J.Phys.G 50 (2023) 2, 020501
- The Future Circular Collider: a Summary for the US 2021 Snowmass Process**, *arXiv:2203.06520*, Snowmass 2022 process
- 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
- 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
- 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)
- 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. B716 (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. D84 (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. [2022-2023] - PI
- (NAISS 2023/6-215) NAISS Medium Storage **ATLAS Sweden Grid Storage** [2023-2024] - member
- (SNIC 2022/6-257) SNIC Medium Storage **Search for Dark Mesons in ATLAS** [2022-2023] - PI
- (SNIC 2021/6-82) SNIC Medium Storage **Search for Dark Mesons in ATLAS** [2021-2022] - PI
- (SNIC 2020/22-2) SNIC Medium Storage **Search for Dark Mesons in ATLAS** [2020-2021] - PI
- (HPC2N) SNIC Medium Compute **Particle Physics at the High Energy Frontier** [2019] - member

## Selected Outreach Activities

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

Latest: Popular science lecture in the Naturvetarveckan 2025 of the Lundellska skolan: "What do we do at CERN? Exploring the World's Largest Particle Physics Laboratory" (March 3, 2025), Uppsala.

- 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), Shift Leader (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.

March 11, 2025