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Current position

2018- **Associate Professor (Docent)**, at the Department of Physics and Astronomy, High Energy Physics division, Uppsala University, Researcher 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**, (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 J. Cuevas and T. Anoro

International Collaborations

2018- Member of the ATLAS Collaboration at CERN

2006-2018 Member of the CMS Collaboration at CERN

Grants and awards

2018 **Vetenskapsrådet Starting Grant**, Swedish Research Council, Individual (VR 2017-05092), Uppsala University, SE.

2017 **Future Fellowship Grant**, Australian Research Council, Individual (FT170100088), University of Adelaide, AU.

Coordination, Leadership

- **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]

Other responsibilities

- Member of the *Advisory Committee of CERN Users (ACCU)*, representing the Swedish User community [2020-]

- *Seminar organizer.* Weekly seminars in Nuclear and Particle physics at the Physics and Astronomy Department, Uppsala University [2019-]
- Member of the steering panel of Art@CMS [2017-2018]
- *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]
- Editor and CMS analysis contact of arXiv:1411.3441 (PRD), arXiv:1209.3489 (PRL), TOP-11-022, and HIG-14-012.

Reviewing activities

- **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]
- *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-]
- **Referee.** European Physical Journal C. [2018-]

Supervision of students

- **PhD supervisor** Olga Sunneborn Gudnadottir, Uppsala University (2019-2023)
- **MSc supervisor**
 - Olga Sunneborn Gudnadottir, Uppsala University (2019)
 - Isis Marina Van Parijs, Vrije Universiteit Brussel (2013)
- **CERN summer student supervisor** Isis Marina Van Parijs (2012) Ivan Shvetsov (2013)

Teaching

- 2019- **Modern Physics (5.0c) [1TE078]**, *Teacher: lectures, problem solving sessions, exam*, Department of Engineering Sciences Uppsala University, SE.
- 2019 **HASCO2019 Summer School**, *Teacher: Introduction*, (21- 26 July) University of Goettingen, DE.
- 2019 **PIER Graduate Week**, *Speaker: Scientific colloquium*, (23 - 26 Sep) DESY, Hamburg, DE.

Formal pedagogic training

- **Supervising Students for Degree Projects.** March - April 2019, Uppsala University (SE). (**2 weeks**).
- **Academic Teacher Training Course.** September - October 2018, Uppsala University (SE). (**5 weeks**).
- **Supervising PhD Students.** September - December 2018, Uppsala University (SE). (**3 weeks**).
- **Supervising student presentations - in theory and in practice.** 27-29 August 2018, Uppsala University (SE). (2,5 days).
- **Student-centered teaching and learning.** 4 December 2018, Uppsala University (SE). (3 hours).

Participation in Thesis Boards

- 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.

Seminars

2020 **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

- 2020 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: 10th 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⁻¹, 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 papers from 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 The top quark group in CMS were submitted during my convenership.
 - 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 **500th 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

- 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](#)
- 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 Public Results

Primary Author, Editor

- 2016 **First results on Higgs to WW at $\sqrt{s} = 13$ TeV**, *HIG-15-003*.
- 2014 **Constraints on Anomalous HWW Interactions using Higgs boson decays to $W+W^-$ in the fully leptonic final state**, *HIG-14-012*.
- 2012 **Observation of Associated Production of a Single Top Quark and W Boson in pp Collisions at $\sqrt{s} = 8$ TeV**, *TOP-12-040*.
- 2011 **Search for single top tW associated production in the dilepton decay channel in pp collisions at $\sqrt{s} = 7$ TeV**, *TOP-11-022*.
- 2010 **Performance of muon identification in pp collisions at $\sqrt{s} = 7$ TeV**, *MUO-10-002*.
- 2008 **Search Strategy for a Standard Model Higgs Boson Decaying to Two W Bosons in the Fully Leptonic Final State**, *HIG-08-006*.
- 2007 **Search for the Higgs boson in the WW decay channel with the CMS experiment**, *HIG-07-001*.

Substantial Contribution

- 2017 **Higgs to WW measurements with 15.2 fb^{-1} of 13 TeV proton-proton collisions**, *HIG-16-021*.
- 2016 **Combination of cross-section measurements of associated production of a single top quark and a W boson at $\sqrt{s} = 8$ TeV with the ATLAS and CMS experiments**, *TOP-15-019*.
Search for ttH production in multilepton final states at $\sqrt{s} = 13$ TeV, *HIG-15-008*.
- 2015 **Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at $\sqrt{s} = 7$ and 8 TeV**, *HIG-15-002*.
- 2014 **Search for $H \rightarrow b\bar{b}$ in association with single top quarks as a test of Higgs boson couplings**, *HIG-14-015*.
Combination of cross-section measurements of associated production of a single top-quark and a W boson at $\sqrt{s} = 8$ TeV with the ATLAS and CMS experiments, *TOP-14-009*.

Constraints on anomalous HVV interactions using H to 4l decays, *HIG-14-014*.

2011 **Measurement of the top-quark pair-production cross section in the lepton+jets channel with the use of b-tagging, *TOP-10-003*.**

Measurement of the top-quark pair-production cross section in the di-lepton channel at 7 TeV, *TOP-10-005*.

2010 **Search for $H \rightarrow WW \rightarrow 2l 2\nu$, *HIG-10-003*.**

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

Selected Outreach Activities

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

Some highlights include:

- Personal **Twitter** account "*1cRebeca*" used mostly 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, *lonely-chairsatcern.tumblr.com* (20K followers).

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 membership:

- 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**.
- 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.

May 5, 2020