

Christopher Palmer

Personal information

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Nationality US Citizen
Date of birth January 05, 1985

Research Interests

Experimental Particle Physics.
Exploring extensions of the Standard Model via detailed studies of the Higgs boson.

Professional History

March 1st, 2021 - Present Assistant Professor at University of Maryland - College Park
2020 and 2021 Distinguished Research at LHC Physics Center (LPC) at Fermilab.
Oct 2016-Feb 2021 Associate research scholar under Princeton faculty Profs. Daniel Marlow and James Olsen.
Oct 2014-Sept 2016 Postdoctoral research associate under Princeton faculty Profs. Daniel Marlow and James Olsen.
Aug 2009-August 2014 Doctoral student of James Branson at UCSD (at CERN April 2010 to April 2013).

Research Positions

Feb 2019-Present Leader of the CMS VHH \rightarrow $b\bar{b}b\bar{b}$ analysis team
Sept 2018 - Sept 2020 Convener of CMS's Higgs to bottom quarks sub-group (CMS L3)
Sept 2018 - Dec 2020 Convener of the LHC Higgs Boson Cross Section sub-group on VH cross sections (LHC Higgs WG1 VH sub-WG)
Sept 2017-Present Leader of the CMS VH \rightarrow $b\bar{b}$ analysis team
January 2016-December 2018 Convener of CMS luminosity physics object group. (CMS L2)
May 2015-Present Leader of CMS forward hadronic calorimeter luminosity operations.
Sept 2014-Present Analyst in the CMS H \rightarrow $b\bar{b}$ group
Sept 2014-Present Analyst in CMS luminosity physics object group.
Jan 2011-August 2014 Analyst in the CMS H \rightarrow $\gamma\gamma$ group

Education

Sept 2007-June 2014 PhD in Experimental Particle Physics at University of California - San Diego.
Advisor: Professor James Branson, UCSD
Co-advisor: Dr. Marco Pieri, UCSD posted at CERN in Geneva.

Aug 2003-May 2007

BS in Astronomy and Mathematics University of Southern California - Los Angeles, CA

Teaching

Particle physics for undergraduates

UMD course Phys 441 during spring 2022, 2023, and 2024 terms.

Introduction to classical mechanics for physics majors

UMD course Phys 171/171H during fall 2021, 2022, and 2023 terms.

Princeton University
Undergraduate Lab
Manager
Sept 2019 – Jan 2020

I was in charge of all written lab material for the introductory classical mechanics lab series for engineers and physicists. This lab sequence emphasizes laboratory techniques including computing statistical uncertainties, error propagation, using MATLAB, and thinking about/reducing systematic errors arising from flawed techniques. One of the labs has only been used a few times (understanding statistical error with geiger counters and common radioactive materials). The data was recorded and a paper is envisioned with departmental teaching faculty, Kasey Wagoner.

Princeton University
Lecturer
Feb 2019 – May 2019

I taught a small section of young engineers and physicists introductory electricity and magnetism. The class met three times per week for 50 minutes. In addition to reinforcing previously lectured material with examples, I wrote problems for some quizzes and exams as well as grading quizzes weekly.

UCSD Lecturer
July 2013 – Sept 2013

I wrote and delivered 3-4 lectures per week for two accelerated-pace classes lasting 5 weeks each. Utilizing demonstrations and interactive, in-class clicker questions, I taught introductory electromagnetism to life science majors and then to engineering majors. I also wrote several exams for this course including many multiple-choice conceptual questions.

UCSD Physics
Laboratory Teaching
Assistant Coordinator
Sept 2008 – March 2010

This position is primarily for managing TA's who are teaching introductory physics laboratories for engineers in the topics of electronics, waves and optics. Responsibilities included: holding meetings, organizing lab write-up/exam grading, developing criteria for grading lab write-ups, ensuring TAs fulfill obligations, holding a class review lecture and meeting with the professor to discuss and plan the progress of the class.

UCSD Physics
Laboratory Development
June 2008 – Aug 2008

Summer posting to re-write laboratory manuals for introductory physics laboratories for engineers.

UCSD Physics Teaching
Assistant (TA)
Sept 2007 – June 2008

Lecture TA for one trimester for introductory physics for engineers. Laboratory TA for two trimesters for introductory physics laboratories for engineers.

Media and Outreach

Princeton Physics EDI Book Club	Kick-off event was organized and hosted by me with help from Katherine Lamos.
ICHEP2020 Higgs Results	Fermilab news
Physics/Astronomy breakout session for Princeton PhD Preview (P3)	I coordinated/facilitated a two-hour presentation+Q&A session for visiting undergraduate scholars interested in graduate physics and astronomy. I helped review applications and select scholars in a few cases. The intention of this program is to help students from under-represented groups to understand the best techniques for making successful applications to graduate school and encourage students to apply to competitive institutes including Princeton. A few of the students said this was the most useful part of their visit to the university. P3 overview
How to Be an Effective Ally (to women in physics)	I was one of five facilitators of small-group discussions that was centered on scenarios that are typical scenarios that women in physics typically encounter. The objective was to discuss how the community can actively support women before and after these situations happen. Princeton WiP promotion , Event photos
CMS Communication video on Higgs boson searches	In celebration of the sixth anniversary of the discovery of the Higgs boson, a collection of six videos, "Six ways to look at the Higgs Boson", was produced and published by CMS. The fifth installment, " Decay into pairs of b quarks ", was written and performed by me with help from CMS Communications Group and Princeton's Physics staff.
Press Releases on Hbb Observation	Fermilab, Princeton University
Program Director UCSD Young Physicists Program (2008-2010)	This monthly program is a morning of interactive fun for middle and early high school students. The all volunteer crew of UCSD graduate students work with small groups of participants to go through reformatted labs and activities for about 90 minutes. Afterwards there is a short (30-40) minute lecture about a research or physics topic. Pizza is provided at the end. I coordinated the graduate student volunteers, faculty speakers and developed activities for participants for two academic years.

Publications

- [0] CMS Collaboration, "Constraints on the Higgs boson self-coupling with combination of single and double Higgs boson production $\sqrt{s} = 13$ TeV", CMS-PAS-HIG-23-006, 2023.
- [1] CMS Collaboration, "Search for Higgs boson pair production with one associated vector boson in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS-PAS-HIG-22-006, Submitted to JHEP, 2024.
- [2] CMS Collaboration, "Search for Higgs boson pair production in the bbW^+W^- decay mode in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS-PAS-HIG-21-005, Submitted to JHEP, 2024.
- [3] CMS Collaboration, "Simplified template cross section measurements of Higgs boson produced in association with vector bosons in the $H \rightarrow b\bar{b}$ decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS-PAS-HIG-20-001, Accepted by PRD, 2024.
- [4] CMS Collaboration, "Precision luminosity measurement in proton-proton collisions at $\sqrt{s} = 13$ TeV in 2015 and 2016 at CMS", Eur. Phys. J. C, (2021) 800, arXiv:2104.01927.
- [5] CMS Collaboration, "Observation of Higgs Boson Decay to Bottom Quarks", Phys. Rev. Lett. 121 (2018) 121801, arXiv:1808.08242. (More than 300 citations.)
- [6] CMS Collaboration, "Evidence for the Higgs boson decay to a bottom quark-antiquark pair", Phys. Lett. B 780 (2018) 501-532, arxiv:1709.07497. (More than 200 citations.)
- [7] CMS Collaboration, "CMS luminosity measurement for the 2017 data-taking period at $\sqrt{s} = 13$ TeV", CMS-PAS-LUM-17-004, 2018. (More than 95 citations.)
- [8] CMS Collaboration, "CMS Luminosity Measurement for the 2016 Data Taking Period," CMS-PAS-LUM-17-001, 2017. (More than 400 citations.)
- [9] CMS Collaboration, "CMS Luminosity Calibration for the pp Reference Run at 5.02 TeV", CMS-PAS-LUM-16-001, 2016. (More than 40 citations.)
- [10] CMS Collaboration, "CMS Luminosity Measurement for the 2015 Data Taking Period," CMS-PAS-LUM-15-001, 2016. (More than 150 citations.)
- [11] CMS Collaboration, "Observation of the diphoton decay of the Higgs boson and measurement its properties". Eur. Phys. J. C 74 (2014) 3076, arXiv:1407.0558. (More than 770 citations.)
- [12] CMS Collaboration, "Updated measurements of the Higgs boson at 125 GeV in the two photon decay channel." CMS-PAS-HIG-13-001, 2013. (More than 300 citations.)
- [13] CMS Collaboration, "Search for a standard model-like Higgs boson in the $\mu^+\mu^-$ and e^+e^- decay channels at the LHC" Phys. Lett. B 744 (2015) 184, arXiv:1410.6679. (More than 110 citations.)
- [14] CMS Collaboration, "Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC," Phys. Lett. B 716 (2012) 30–61, arXiv:1207.7235. (Higgs discovery—more than 16000 citations.)
- [15] CMS Collaboration, "A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider," Science 338 (2012) 1569–1575, 10.1126/science.1230816. (Higgs discovery—129 citations.)
- [16] CMS Collaboration, "Search for the standard model Higgs boson decaying into two photons in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Lett. B 710 (2012) 403–425, arXiv:1202.1487. (More than 250 citations.)

Conferences and Invited Talks

November 27, 2023	"Measurements of third generation Higgs boson Yukawa couplings" (<i>Higgs 2023</i>).
October 25, 2023	"Searching for Rare Higgs Boson Pair Production with a W or Z Boson (VHH)" (<i>UVA Seminar</i>).
September 24, 2021	"CMS precise luminosity determination with 2016, center-of-mass energy of 13 TeV dataset" (<i>FSU Seminar</i>).
April 18, 2021	"Precision luminosity measurement with proton-proton collisions at the CMS experiment in Run 2" (<i>APS April Meeting 2021</i>).
August 3rd, 2020	"Higgs Experimental Overview (for ATLAS and CMS)" (<i>ICHEP 2020</i>).
March 30th, 2020	"Observation of the Higgs boson to bottom quarks" (<i>University of Tennessee - Knoxville</i>).
March 4th, 2020	"Observation of the Higgs boson to bottom quarks" (<i>Boston University</i>).
February 25th, 2020	"Observation of the Higgs boson to bottom quarks" (<i>University of Maryland - College Park Seminar</i>).
February 19th, 2020	"Observation of the Higgs boson to bottom quarks" (<i>Purdue University</i>).
May 2nd, 2019	"Status of VH ($H \rightarrow b\bar{b}$) at CMS" (<i>Game of Flavours - CMS Heavy flavour tagging workshop 2019</i>).
March 4th, 2019	"Observation of the Higgs boson to bottom quarks" (<i>University of Alabama</i>).
February 20th, 2019	"Observation of the Higgs boson to bottom quarks" (<i>Michigan State</i>).
January 30th, 2019	"Observation of the Higgs boson to bottom quarks" (<i>University of Minnesota</i>).
December 6th, 2018	"Observation of the Higgs boson to bottom quarks in CMS" (<i>Karlsruhe Institute of Technology - Colloquium</i>).
August 31st, 2018	"Observation of the Higgs boson to bottom quarks" (<i>Fermilab Wine and Cheese</i>).
July 2018	"CMS H(125) to bb results" (<i>Higgs Hunting 2018</i>).
July 2018	"Van der Meer calibration of the CMS luminosity detectors in 2017" (<i>ICHEP 2018</i>).
December 15th, 2017	"Evidence for associated Higgs to bb production at CMS" (<i>Fermilab Wine and Cheese</i>).
August 2016	"Measurements of Higgs boson production and properties in the $b\bar{b}$ decay channel using the CMS detector" (<i>ICHEP 2016</i>).
March 2013	"CMS Measurements of a New Boson in the Gamma Gamma Channel" (<i>LISHEP2013: Workshop on High Energy Physics in the Near Future</i>).
June 2012	"Searches for a Light Higgs with CMS" (<i>Conference on the Intersections of Particle and Nuclear Physics</i>).
Aug 2011	"A Search for the Higgs Boson In $H \rightarrow \gamma\gamma$ Mode" (<i>Meeting of the Division of Particles and Fields of the American Physical Society</i>).

Committees and Service

July 2022-now	"Equity and Diversity Advocate" (<i>UMD Physics Dept</i>).
Jan 2023-now	"Executive Committee Member for Diversity and Inclusion Forum" (<i>American Physical Society</i>).
Fall 2022	"Search Committee for Assistant Dean for Diversity and Strategic Initiatives" (<i>UMD CMNS</i>).

Jan 2022-now	“Diversity, Equity, Inclusion Committee” (<i>United States CMS Collaboration</i>).
Fall 2021-Spring 2022	“Faculty Search Committee” (<i>UMD Physics</i>).
Fall 2021-now	“Diversity and Inclusion Council” (<i>UMD CMNS</i>).
October 18-22, 2021	“Program Committee” (<i>Higgs 2021</i>).
October 26-30, 2020	“Yukawa session convener” (<i>Higgs 2020</i>).