Marko Stamenkovic

Experimental Particle Physics

PERSONAL DETAILS

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Languages	French (mother tongue), English, German, Serbian

EDUCATION

Ph.D. in Experimental High-Energy Physics 2017–2022
Nikhef and UvA, University of Amsterdam, Netherlands, supervisor: Prof. W. Verkerke, Prof. T. du Pree
Direct constraint on Higgs-charm coupling with ATLAS

M. Sc. and B.A. in Experimental Physics 2012–2017
EPFL, Ecole Polytechnique Fédérale de Lausanne, Switzerland, supervisor: Prof. T. Nakada
Search for new physics in $c \to u$ transitions with LHCb

FELLOWSHIPS, GRANTS AND AWARDS

Postdoctoral fellowship at Brown University 2022–present
Brown University, CMS group, supervisor: Prof. Greg Landsberg

LPC 2025 distinguished researcher award 2025
FNAL, Fermilab, CMS group, 40'000 USD

LPC 2024 distinguished researcher award 2024
FNAL, Fermilab, CMS group, 40'000 USD

CMS poster award 2023
1st prize: Probing the Higgs potential through HHH production, CMS week at Saint-Malo

Swiss National Science Foundation PhD mobility grant 2021
LBNL, Lawrence Berkeley National Laboratory, ATLAS group, 26'000 CHF

Under review: European Research Council Starting Grant (PI) 2025
ETH Zürich, CMS group, 1'500'000 EUR
Status: selected for interview in June 2026 (top $\approx 20\%$).

ACADEMIC QUALIFICATIONS

Qualification: Maître de conférences 2025–2029
Ministère de l'Enseignement supérieur et de la Recherche (France)
Qualified by the French National Council of Universities for Maître de conférences positions.

PHYSICS ANALYSIS ACTIVITIES

Search for HH and HHH with the CMS detector 2022–present
CMS group, Brown University, supervisor: Prof. Greg Landsberg

Founded and led CMS HHH working group; delivered CMS first nonresonant HHH searches and the joint constraint on (κ_3, κ_4), constraining unitarity-bound for the first time. HHH included in 2026 European Strategy Update as a priority. Collaboration on Run 3 HH analyses in light of a combined measurement of HH and HHH.

Jet-charge tagger 2025–present

CMS BTV studies group

Initiator and developer of the first jet-charge tagger in CMS, achieving a performance of 70% correct identification on b-jets (30% mis-identified $\bar{b}$-jets) and 80% on c-jets (20% mis-identified $\bar{c}$-jets). This performance is similar to the best jet-charge taggers developed at LEP.

HH and HHH parking at HLT 2023–2025

CMS Trigger studies group

Developer and maintainer of the HH and HHH parking strategy of the CMS collaboration for Run 3 data taking. In total, 350 Hz (7% of the total CMS HLT budget) dedicated to HLT paths targeting b-jets and hadronic τ-signatures to improve the sensitivity of the CMS experiment to the HH and HHH processes.

Search for Higgs boson coupling to charm quarks, PhD Thesis 2017–2022

ATLAS group, Nikhef, supervisor: Prof. Wouter Verkerke, Dr. Tristan du Pree, Dr. Hannah Arnold

Direct search for the standard model Higgs boson decaying to a pair of charm quarks using data collected by the ATLAS experiment at CERN between 2015 and 2018 at $\sqrt{s} = 13$ TeV. Role: main analyser of the 2-lepton channel and the combination of the 0-/1-/2-lepton channels, software implementation of the VH(cc) analysis, main designer of the analysis strategy to achieve orthogonality with H(bb), first kinematic fit in the Z(ll)H(cc) topology, background modelling, interpretation of the κ_c coupling modifier, combination with VH(bb), extrapolation to HL-LHC, main editor of the internal documentation (400 pages). This work resulted the inclusion of κ_c in the Higgs combination and the result was published in *Nature*.

Flavor tagging: exclusive D-mesons reconstruction 2021–2022

ATLAS group, LBNL, supervisor: Prof. Heather Gray, Dr. Miha Muskinja

Study on possible improvements in flavor tagging algorithms using exclusive D-meson reconstructions, focus on reconstruction of $D^+ \to K^-\pi^+\pi^+$, $D^0 \to K^-\pi^+$ and $D^0 \to K^-\pi^+\pi^-\pi^+$, inclusion of $D - K$ charge correlation in flavor tagging algorithms, new flavor tagging calibrations using $W + D$ analysis. Work on $H \to c\bar{c}$ towards combination of direct and indirect constraints on κ_b and κ_c.

Search for new physics in $c \to u$ transitions, Master Thesis 2017

LHCb group, LPHE, EPFL, supervisor: Prof. Tatsuya Nakada

Search for the rare decay $\Lambda_c^+ \to p\mu^+\mu^-$ using data collected by the LHCb experiment at CERN in 2016 at a center-of-mass energy of $\sqrt{s} = 13$ TeV. Complete analysis of the process, selection optimisation using machine learning algorithms, statistical analysis.

LEADERSHIP POSITIONS

CMS HGCAL ECON testing 2024–present

Fermilab CMS group

Main contributor to the HGCAL ECONT and ECOND production chips testing as part of the Fermilab HGCAL effort, including total ionizing dose tests performed at CERN in July 2024, January and July 2025, testing of more than 20'000 chips at Fermilab. Led crucial studies of the output-buffer vulnerability, informing mitigation plans.

CMS Hbb convener 2023–2025

Higgs CMS group, L3 position

Hbb convener for the CMS Higgs group. Review and organisation of Run 2 and Run 3 Hbb and Hcc analyses in CMS, including HH4b, VHbb/cc, ttHbb/cc, VVHbb, Hbb+photon, HHH. In total, 10 analyzes published.

CMS Higgs Trigger contact 2022–2023

Higgs CMS group, L3 position

Convener of the Higgs trigger studies for the CMS collaboration. Responsible for 150 trigger filters used during data taking to ensure that the best data is collected for analyses targeting the Higgs boson. Major contribution: implementation of the HH parking strategy for 2023, which will allow to record 60% more $HH \to b\bar{b}b\bar{b}$ events with respect to 2015–2018. Updated path to include $HH \to b\bar{b}\tau\bar{\tau}$ in 2024 resulting in 70% additional signal acceptance.

CMS HCAL Prompt Feedback Group convener 2023

HCAL CMS group, L3 position

Convener of the Prompt Feedback Group for the HCAL subdetector of the CMS experiment. Weekly feedback on the quality of the data recorded by the HCAL subdetector.

CMS HCAL operations 2022–2025

HCAL CMS group

Support for HCAL operations and interventions during data taking to ensure that quality data is taken by the CMS detector. Main contributor to the back-end electronics resynchronization functionality, which allowed to save 1–2 fb^{-1} of data per year.

ATLAS Calibration Data Interface contact 2018–2022

Flavor tagging group

Main responsible of the flavor tagging distribution (including the tagger definitions and calibrations) centrally provided to the ATLAS collaboration. Implemented validation procedure of the calibrations and improve post-processing procedures as well as novel submission interface for calibrations.

CONTRIBUTIONS TO THE FIELD

Marie Skłodowska–Curie Postdoctoral Fellowships expert evaluator 2025

European Commission (REA), Horizon Europe

Served as external expert evaluator for the 2026 MSCA Postdoctoral Fellowships call, providing detailed remote reviews and consensus feedback to help ensure fair, high-quality selections.

ETH Medal reviewer 2025

Swiss Institute of Technology in Zurich, ETHZ

Expert reviewer for ETH medal awarded to 8% best doctoral theses performed at ETHZ.

Journal of High Energy Physics (JHEP) - peer reviewer 2025

SISSA Medialab / Springer Nature

Expert reviewer for the Journal of High Energy Physics, providing detailed critiques that helped elevate the journal's publication standards.

Nuclear Physics B - peer reviewer 2025

Elsevier

Expert reviewer for the Nuclear Physics Section B, providing detailed critiques that helped elevate the journal's publication standards.

Invited Higgs Session Chair 2025

SUSY 2025 – International Conference on Supersymmetry and Unification of Fundamental Interactions

Chaired the Higgs physics session, coordinating speakers and program selection.

STUDENTS SUPERVISION

Machine learning at CMS: anomaly detection, tau reconstruction 2023–2025

Ekin Seclimis, Jason Huang, Hayden Miller, Rohan Pankaj, Jordan Pfeifer, Gavin Pitt, Arjun Nagamangalam, Saswata Majumder, Jake Lippert and Ziqi Fang, Brown University

Brown summer student program at CERN together with Greg Landsberg and Loukas Gouskos. Daily supervision of undegrad students during the summer at CERN.

Symmetry preserving attention networks for jet assignment in HHH 2023
Jovan Mitic, University of Belgrade

Supervision during master thesis, usage of advanced machine learning tools to improve pairing efficiency of Higgs bosons for HH and HHH processes.

Charm fragmentation studies: $W + D^0$, $D^0 \to K^-\pi^+\pi^-\pi^+$ 2021
Riley Clark, University of California Berkeley

Supervision during undergraduate research program (URAP), test of charm fragmentation function in ATLAS, aim at testing the results observed by ALICE in pp-collisions.

Exclusive D-meson reconstructions to improve charm tagging 2020–2021
Zhuoran Feng, University of Amsterdam

Supervision during the master thesis in the Nikhef ATLAS group, successfully improved the sensitivity of the $H \to c\bar{c}$ analysis by 5% with new exclusive reconstructions methods. Zhuoran was successfully hired for a PhD position at Nikhef during her master project.

Implementation of a neural network in the $H \to c\bar{c}$ analysis 2020
Cecile van der Stappen, University of Amsterdam

Supervision during the bachelor thesis in the Nikhef ATLAS group, achieved a +50% improvement in the sensitivity of the 2-lepton $H \to c\bar{c}$ channel.

Optimisation of the smoothing of b-jet identification efficiency 2018–2019
Hayden Smith, Oxford University

Supervision during the qualification task in the ATLAS flavor tagging group, resulted in a publication.

TEACHING ACTIVITIES

Introduction to programming (Python): x2 2019
University of Amsterdam, Dr. Ivo van Vulpen and M.S. Martijn Stegeman

Bachelor level lecture with 20 sessions per course.

Introduction to (astro-)particle physics 2018
University of Amsterdam, Prof. Patrick Decowski and Dr. Ivo van Vulpen

Bachelor level lecture with 20 sessions per course.

Classical mechanics and Introduction to C++ programming 2013–2017
EPFL, Ecole Polytechnique Fédérale de Lausanne

Bachelor level lecture with 14 sessions per semester for 6 semesters.

SCIENCE COMMUNICATION AND OUTREACH

LPC Book Club organizer 2024–2026
Fermilab CMS group

Organized a discussion series together with Joel Butler on historical breakthroughs (PS, SPS, SPPS, Main Ring, Tevatron, LEP, SSC, LHC) and their implications for next-generation machines; book summaries; speaker coordination and session moderation.

Triple Higgs Frontiers: Mapping Higgs self-couplings (2025 HHH workshop) 2025
CERN EP News

Article - Link

Search for charming decays of the Higgs 2021
Online, social media

ATLAS outreach video explaining $H \to c\bar{c}$ result - Link

Nikhef paperclip - Finding Higgs to cc 2021
Online, social media
Nikhef outreach video explaining $H \to c\bar{c}$ result - Link

Nikhef blog - Last proton-proton collisions of Run 2 2018
Amsterdam, Netherlands
Article about last Run 2 proton-proton collisions with the ATLAS detector - Link