Savvas Kyriacou

Curriculum Vitae

Education

2012– 2019 **Ph.D**, *Rutgers the State University of New Jersey*, New Jersey,US, *Experimental High Energy Physics*.
Dissertation Title: *Search for new physics in event with collimated photons and gluons.*

2008–2012 **Bsc**, *University of Cyprus*, Nicosia, Cyprus, *Physics*.
Cum Laude

Academic Positions

2019 – present **Postdoctoral Fellow**.
The Johns Hopkins University

2012 – 2019 **Research Assistant**.
Rutgers the State University of New Jersey

Research Experience

Postdoctoral

CMS Tracker Alignement.
Service work for the CMS Tracker alignment group, utilizing the cosmic and beam prepartion runs for the Run3 data-taking of the LHC. (Ongoing work)

Higgs offshell measurements.
Measuring properties of the Higgs boson and its couplings using the offshell production of the Higgs. (Ongoing work)

Higgs couplings to virtual photons in the Higgs to 4 lepton final state.
Phenomenological study of the Higgs couplings to virtual photons using the H→4l final state, in production and decay. This work has been published by PRD[2].

Higgs anomalous couplings measurements in the H→4l final state .
Measuring anomalous contributions to the Higgs boson couplings, in the four-lepton final state, using data from the LHC Run2, collected by the CMS experiment. Statistical models and complex templating fitting techniques are utilized to quantify the anomalous couplings of the Higgs boson within the SMEFT framework. This work has been published by PRD[3].

+1(865) 443 2810 • savvasphy@gmail.com

Graduate

Thesis Project:*Search for new physics in events with collimated photons and gluons*.
Developed an analysis to search for supersymmetric signatures at the LHC. This included the development of novel jet-substructure techniques implemented in CMSSW using FastJet. The results of this project are published in PRL[4].

L1-Track Trigger Firmware Development.
Engaged in the development of Firmware code, implementing part of the Tracklets tracking algorithm for track reconstruction at the L1 Trigger level on FPGAs[5].

Photon Cut Based ID design.
Developed and optimized multiple ID versions for the official photon identification in CMS using a cut-based approach, between 2013-2016.

Ph.D Qualifier Project.
Applied Boosted Decision Trees on a search for stub tracks in CMS and tested if a sensitivity improvement can be obtained for the analysis.

Positions Held

2021-present **LHC Higgs Offshell WG convener**, Serve as a liaison between the CMS experiment and the greater Higgs community, motivating and participating in studies for the offshell production of the Higgs boson.

2020-present **CJLST group coordinator**, Coordinate the activities of a cross university analysis team, focusing on Higgs studies utilizing the 4l final state.

2014-2017 **EGamma Contact for the B2G Group in CMS**, Served as a liaison and a photon/electron object expert for analysts in the B2G group in CMS and the EGamma group.

2016 **Trigger shifter in CMS**, Served as an on-site Trigger shifter, monitoring the triggering system during data-taking.

Publications and Conference Talks

Selected Publications

[1] Snowmass White Paper: Prospects of CP-violation measurements with the Higgs boson at future experiments,May 2022, ***arXiv:2205.07715***

[2] Constraining anomalous Higgs boson couplings to virtual photons, J.Davis et al., Sept. 2021, ***arXiv:2109.13363***

[3] Constraints on anomalous Higgs boson couplings to vector bosons and fermions in its production and decay using the four-lepton final state, CMS Collaboration, Sept. 2021, ***DOI:10.1103/PhysRevD.104.052004***

[4] Search for Physics beyond the Standard Model in Events with Overlapping Photons and Jets, CMS Collaboration, Dec. 2019, ***DOI:10.1103/PhysRevLett.123.241801***

[5] FPGA-Based Tracklet Approach to Level-1 Track Finding at CMS for the HL-LHC, E.Bartz et al., Jun. 2017, ***arXiv:1706.09225***

Conference Talks

HIGGS 2021, ATLAS+CMS: SM Higgs-boson properties: mass, width, CP, virtual, USA Oct. 2021

HIGGS 2021, The JHU generator framework: EFT applications in Higgs physics, virtual, USA Oct. 2021

IRN@ZOOM Terascale International Research Network, Constraints on anomalous Higgs boson couplings to vector bosons and fermions in production and decay in the H to 4l channel with CMS, virtual, FR Nov. 2020

ICHEP,Measurements of anomalous Higgs boson couplings at CMS, Prague, CZ Jul. 2020

Higgs Couplings 2019, CP in Higgs couplings at CMS University of Oxford, UK Oct. 2019

American Physical Society April Meeting 2017 The FPGA based L1 track finding Tracklet approach Washington DC, USA Jan. 2017

American Physical Society April Meeting 2017 Search for boosted Stealth SUSY with photons and jets using 13TeV LHC data. Washington DC, USA Jan. 2017

Awards

2013 Richard J.Plano Outstanding Teaching Assistant Award

Computer skills

Operating Systems: Linux, MS Windows

Programming Languages: C++ (routine use), PYTHON (routine use),Verilog, bash

Applications: ROOT, LaTeX, CMSSW, MadGraph, Pythia, Vivado Suite, TMVA

Outreach

Virtual Tour Guide: In several occasions I served as a virtual tour guide at CERN, explaining what CMS and LHC are pursuing to the general public. This included a science festival held in Cyprus and multiple virtual tours with Greek and Cypriot schools.

Languages

Greek **Native speaker**

English **Fluent**

French **Intermediate**