

Dr. Konstantinos Theofilatos

CURRICULUM VITAE

Personal information

Family Name: Theofilatos, First Name: Konstantinos

Email: konstantinos.theofilatos@cern.ch, ktheofi@phys.uoa.gr

Phone: +30 210 727 6904

Inspire: [INSPIRE-00305433](https://inspirehep.net/literature/1588833), Orcid: [0000-0001-8448-883X](https://orcid.org/0000-0001-8448-883X)

Web: <http://cern.ch/theofil/> and also on [GitHub](#)

Positions

- Associate Professor, National and Kapodistrian University of Athens (GR) [12/2018 – on-going]
Department of Physics, Section of Nuclear and Particle Physics
- Career break (**military service**) [2018]
- Oberassistent, Swiss Federal Institute of Technology (CH) [09/2015 – 12/2018]
Duties included: research, teaching and management of research
- Research Associate, Swiss Federal Institute of Technology (CH) [09/2009 – 08/2015]
- PhD Fellow, NCSR Demokritos Institute of Nuclear Physics (GR) [09/2003 – 01/2008]

Education

- PhD in Physics, National Technical University of Athens [02/2005 – 05/2009]
Experimental particle physics, CERN CMS experiment
- MSc in Physics, National Technical University of Athens [09/2003 – 02/2005]
- BSc in Physics, University of Patras [09/1997 – 09/2002]

Distinctions

- CERN Beam Line for Schools competition [2014]
scientific advisor of the Greek high school that won the competition
- Fellowship (4.5 years) from the Inst. of Nuc. Phys. NCSR Demokritos [2003]
awarded through examinations in Physics and Mathematics
- Scholarship (4.5 years) from Greek State Scholarship Foundation [2004]
most prestigious Greek fellowship awarded through national wide examinations in Physics and Mathematics
- Top grade (9.4/10.0) distinction as MSc student in a class of ~ 20 students [2003 – 2005]
MSc program conducted in School of Applied Mathematics and Physical Science at NTUA; top grade student receives an one off money award from the Greek State Scholarship Foundation

Teaching

- Special Theory of Relativity, NKUA, 3rd year mandatory course – [10YK035](#)
- Computational Physics, NKUA, 2nd year mandatory course – [10YK021](#) and [on GitHub](#)
- Introduction to Nuclear Physics and Particle Physics Lab, NKUA, 3rd year mandatory course – [10EKA04](#)
- Nuclear Physics and Particle Physics Lab, NKUA, 4th year selective course – [10YK403](#)

As teaching assistant in ETH Zurich I have taught 14 courses in total, at undergraduate and master level. Topics included: Phenomenology of Physics Beyond the Standard Model, Nuclear and Particle Physics, General Physics I, General Physics II as well as a number of different laboratory courses.

Supervision of students

- BSc: 4
- MSc: 1 (co-supervision while at ETH Zurich)
- PhD: 3 (co-supervision while at ETH Zurich)

The PhD students that I co-supervised are credited for their unique contributions and are now recognized as experts within the CMS collaboration, having given the pre-approval and approval CMS-internal talks as well as reports at renowned international conferences.

Committees for PhD and MSc thesis examination

- MSc: (3) NKUA,
- PhD: (2) NKUA, (1) NTUA, (1) Milano-Bicocca

Scientific responsibilities held

- Co-contact for [Herwig MC event generator](#) in CMS [since 2020]
responsible for the CMSSW interface of the Herwig MC event generator
- Co-convener of the Standard Model (Experiment) group in [Les Houches 2017](#) [2017]
Les Houches Workshop Series "Physics at TeV Colliders"
- Co-convener of the Electroweak session in [LHCP 2016](#) [2016]
Large Hadron Collider Physics Conference 2016
- Co-convener (L2) of the [CMS Standard Model Physics group](#) [2015 – 2017]
The CMS collaboration is organized in 9 physics groups and multiple subgroups within; the SMP group is charged to perform all the QCD and EWK measurements in final states with jets, vector bosons, vector bosons + jets and multibosons. I had the honor to be entrusted the leadership of this group in the period that the LHC geared-up at $\sqrt{s} = 13$ TeV, having as mission to timely perform the first SM cross section measurements in a new energy regime and provide a solid reference for the beyond the standard model physics searches.
- Co-convener (L3) of the CMS Standard Model Vector Boson + Jets group [2013 – 2015]
a mid-sized physics group that had about 50 active research scientists along the indicated period
- Co-convener of the LHCC EWWG, CMS V+jets contact [2013 – 2015]
working group with ATLAS and CMS participation dedicated to the discussion of accurate measurements of electroweak phenomena and parameters at the LHC
- Co-contact of the CMS ECAL group in "CMSCaloEflowHPUTaskForce" [2013]
taskforce studying the impact of high pile-up conditions in the forward CMS calorimeters, with major contribution in solving the puzzle of the modeling of ECAL response in the presence of out-of-time pileup
- Contact for the CMS ECAL local reconstruction [2009 – 2012]
responsible of the CMS ECAL local reconstruction, during the period of the Higgs discovery; ECAL performance critical for the visibility of the $h \rightarrow \gamma\gamma$ mass peak
- Coordinator (L3) of the CMS ECAL testbeam calibration [2007]
H4 testbeam at CERN for calibrating ECAL endcaps before the LHC start-up
- Member of [CMS](#) collaboration at [CERN](#) [since 06/2006]

Journals

- Reviewer in [Journal of High Energy Physics](#)
- Reviewer in [Journal of Instrumentation](#)
- Reviewer in [Physical Review and Reviews of Modern Physics](#)
- Reviewer in [European Physical Journal C](#)
- CMS Analysis Review Committees: 11 concluded, 2 on-going [2021]

Organization of scientific meetings

- Co-convener of the Standard Model (Experiment) group in [Les Houches 2017](#) [2017]
- Co-convener of the Electroweak session in [LHCP 2016](#) [2016]
- CMS SMP General biweekly meetings, approvals, joint theory/exp meetings [2015-2017]
- CMS SMP VJ biweekly meetings, pre-approvals [2013-2015]

Conference talks, invited talks, session chairing

SUSY 2022 **invited talk** “[New experimental results on BSM searches from ATLAS and CMS](#)” (06/2022 Greece); Brookhaven Forum 2021 **opening plenary** “[LHC Measurement Highlights](#)” (11/2021 USA); Les Houches Workshop “Physics at TeV Colliders” “[Precision SM, Experimental Summary Talk](#)” (2017 France); NKUA **seminar** “[The standard model, so far, so good, so what’s next ?](#)” (10/2017 Greece); LHCP2016 **session chair** “[Convener of the Electroweak parallel session](#)” (06/2016 Sweden); DESY **seminar** (12/2016 Germany); Strategic workshop for the preparation of pillar 1 Swiss HEP white paper **invited talk** “[EW & QCD results and prospects](#)” (06/2016 Switzerland); CERN **seminar** (05/2016 Switzerland); CERN Collider x-talk **invited talk** “[SUSY Searches with MET, jets and opposite sign di-leptons from ATLAS and CMS](#)” (04/2015 Switzerland); Durham Higgs+jets Workshop **invited talk** “[CMS V+jets results](#)” (12/2014 UK); CERN TH BSM Forum **invited talk** (joint talk with Prof. Ben Allanach) “[Explaining CMS lepton excesses with supersymmetry](#)” (11/2014 CERN); DM@ETH **invited talk** “Prospects for sparticle and dark matter detection” (09/2014 Switzerland); ICNFP2014 **invited talk** “Search for a dileptonic edge with CMS” (08/2014 Greece); HEP2014 **invited talk** “Inclusive SUSY searches at CMS” (05/2014 Greece); Uppsala **seminar** “A big challenge at the LHC” (12/2013 Sweden); Moriond QCD 2013 **plenary** (La Thuile Italy) “[W/Z+\(HF\)Jets Production at the LHC](#)” (03/2013 Italy); IEEE2012 “Mitigation of Anomalous APD signals in the CMS ECAL” (11/2012 USA); SUSY2012 “Searches for SUSY in final states with photons at CMS” (08/2012 China); CERN LHC EWWG **invited talk** “[W/Z + jets with CMS](#)” (04/2012 Switzerland); SMU Seminar (USA) **invited talk** “A novel way to search for new physics in Z+MET” (03/2012 USA); PANIC11 “Performance of the CMS ECAL in LHC (poster)” (07/2011 USA); PANIC11 “Search for SUSY at CMS in lepton or photon final states” (07/2011 USA); CALOR2010 (ICHEP China) **plenary talk** “[CMS ECAL performance with the first LHC collisions](#)” (05/2010 China);

Outreach

- Tutorial session in the [Introduction to the Terascale](#), DESY (2023), [\[GitHub\]](#) and [lecture notes](#).
- CERN Courier “Studies of Electroweak-boson production by CMS” (Dec 2016) [\[link\]](#), inspired and authored the story of the outreach article
- Scientific advisor of the winning proposal submitted by Varvakeios High School's in the CERN Beam Line for School competition with 455 schools around the world participating in the competition (2014) [\[link\]](#)
- Assistant in CMS Mini Masterclass with International School of Geneva “ECOLINT” (2014)
- Assistant in CMS Mini Masterclass with British students (2013)
- Mentor in CMS Mini Masterclass with Greek students from Varvakeios High School (2013)
- Assistant in European Masterclasses for High School Students, NCSR Demokritos (2006)
- Assistant in European Masterclasses for High School Students, NCSR Demokritos (2005)

PUBLICATIONS

Dr. Konstantinos Theofilatos

Publications

As of July 2021, the total number of publications that I have (co-)authored is 1080, with h-index 161. Below, I list some indicative publications, in chronological order, for which I had primary intellectual involvement. My full publication list could be found through [inSPIRE](#).

1. A. Zabi et al., [CERN-LHCC-2020-004](#) – The Phase-2 Upgrade of the CMS Level-1 Trigger
2. CMS Collaboration, [JHEP 12 \(2016\) 013](#) – Search for new physics in final states with two opposite-sign same-flavor leptons, jets and missing transverse momentum in pp collisions at $\sqrt{s}=13$ TeV
3. CMS Collaboration, [JHEP 10 \(2015\) 128](#) – Comparison of the $\sigma(Z/\gamma^* + jets)$ to $\sigma(\gamma + jets)$ cross sections in pp collisions at $\sqrt{s} = 8$ TeV
4. CMS Collaboration, [JHEP 04 \(2015\) 124](#) – Search for physics beyond the standard model in events with two opposite-sign same-flavor leptons, jets, and missing transverse energy in pp collisions at $\sqrt{s} = 8$ TeV
5. CMS Collaboration, [PLB 722 \(2013\) 238-261](#) – Azimuthal correlations and event shapes in Z+jets production in pp collisions at $\sqrt{s} = 7$ TeV
6. CMS Collaboration, [JINT 8 \(2013\) P09009](#), Energy calibration and resolution of the CMS electromagnetic calorimeter in pp collisions at $\sqrt{s} = 7$ TeV
7. CMS Collaboration, [PLB 716 \(2012\) 260-284](#) – Search for physics beyond the standard model in events with a Z boson, jets and missing transverse energy
8. CMS Collaboration, [JHEP 1210 \(2012\) 018](#) – Search for supersymmetry in hadronic final states using MT2 in pp collisions at 7 TeV
9. CMS Collaboration, [JINST 6 \(2011\) P09001](#) – Missing transverse energy performance of the CMS detector
10. CMS Collaboration [JINST 5 \(2010\) T03010](#) – Performance and Operation of the CMS electromagnetic calorimeter

Publications as SMP-VJ subgroup convener

During my convenership (2013-2015) the SMP-VJ group authored 12 publications out of a total of 15 that CMS had produced in this field of studies since the beginning of the LHC.

- [JHEP 11 \(2016\) 147](#) – Measurement of the cross section of the electroweak production of a W boson with two jets in pp collisions at $\sqrt{s} = 8$ TeV
- [JHEP 10 \(2015\) 128](#) – Measurement of the $\sigma(Z/\gamma^* + jets)/\sigma(\gamma + jets)$ cross section ratio in pp collisions at $\sqrt{s} = 8$ TeV
- [PAS-SMP-14-009](#) – Measurement of the double differential cross section of Z bosons produced in association with jets in pp collisions at $\sqrt{s} = 8$ TeV
- [JHEP 04 \(2017\) 022](#) – Measurement of the differential production cross section of Z bosons in association with jets in pp collisions at $\sqrt{s} = 8$ TeV
- [PRD 91 \(2015\) 052008](#) – Jet multiplicity and differential production cross sections of Z+jets events in proton-proton collisions at $\sqrt{s} = 7$ TeV
- [PLB 741 \(2015\) 12](#) – Differential cross section measurements for the production of a W boson in association with jets in proton-proton collisions at $\sqrt{s} = 7$ TeV
- [JHEP 02 \(2014\) 013](#) – Measurement of W+c production in pp collisions at $\sqrt{s} = 7$ TeV
- [PLB 735 \(2014\) 204](#) – Measurement of the production cross section for a W boson and two b jets in pp collisions at $\sqrt{s} = 7$ TeV

- [JHEP 06 \(2014\) 120](#) – Measurement of the production cross sections for a Z boson and one or more b jets in pp collisions at $\sqrt{s} = 7$ TeV
- [JHEP 06 \(2014\) 009](#) – Measurement of the triple-differential cross section for γ +jets production in proton-proton collisions at $\sqrt{s} = 7$ TeV
- [JHEP 12 \(2013\) 039](#) – Measurement of the cross section and angular correlations for associated production of a Z boson with b hadrons in pp collisions at $\sqrt{s} = 7$ TeV
- [PRD 88 \(2013\) 112009](#) – Rapidity distributions in exclusive Z+jet and γ +jet events in pp collisions at $\sqrt{s} = 7$ TeV

Publications as SMP convener

- [JHEP 11 \(2016\) 147](#) – Measurement of electroweak production of a W boson and two forward jets in proton-proton collisions at 8 TeV
- [CMS PAS-SMP-15-004](#) – Inclusive W/Z cross section at 13 TeV
- [CMS PAS-SMP-15-005](#) – ZZ cross section measurement at 13 TeV
- [CMS PAS-SMP-15-006](#) – WZ cross section measurement at 13 TeV
- [EPJC 76 \(2016\) 451](#) – Inclusive jets at 13 TeV
- [CMS PAS-SMP-15-010](#) – Measurement of Z+jets at 13 TeV
- [EPJC 77 \(2017\) 92](#) – Wbb cross section measurement at 8 TeV
- [JHEP 10 \(2017\) 072](#) – $W\gamma\gamma$ cross section and limits on aQGC at 8 TeV
- [CMS PAS-SMP-14-007](#) – W-like measurement of the Z boson mass at 7 TeV
- [CMS PAS-SMP-15-011](#) – Differential measurements of inclusive Z boson at 13 TeV
- [PLB 766 \(2017\) 268](#) – WZ cross section at 13 TeV with the full 2015 datasample
- [PRD 95 052002 \(2017\)](#) – W+jets at 8 TeV
- [PLB 763 \(2016\) 280](#) – ZZ cross section at 13 TeV with the full 2015 datasample
- [JHEP 10 \(2017\) 131](#) – Measurement of jet charge observables in dijet events at $\sqrt{s} = 8$ TeV
- [CMS-PAS-SMP-16-006](#) – Measurement of the W^+W^- cross section in pp collisions at $\sqrt{s} = 13$ TeV
- [JHEP 02 \(2017\) 096](#) – Measurement of the transverse momentum spectra of weak vector bosons produced in proton-proton collisions at $\sqrt{s} = 8$ TeV
- [CMS-PAS-SMP-15-002](#) – Measurements of ϕ^* differential cross sections for Drell-Yan events in pp collisions at $\sqrt{s} = 8$ TeV
- [CMS-PAS-SMP-15-001](#) – Combination of results from the ATLAS and CMS experiments on anomalous triple gauge couplings from ZZ production in pp collisions at a center-of-mass energy of 7 TeV at the LHC
- [EPJC 78 \(2018\) 287](#) – Measurement of associated Z + charm production in pp collisions at $\sqrt{s} = 8$ TeV
- [CMS-PAS-SMP-16-004](#) – Measurement of the production cross section for $pp \rightarrow Z\gamma \rightarrow \nu\nu\gamma$ at $\sqrt{s} = 13$ TeV
- [PRD 96 \(2017\) 072005](#) – Measurement of the differential cross section for the production of a $W(\rightarrow \mu\nu)$ in association with jets at $\sqrt{s} = 13$ TeV
- [CMS-PAS-SMP-16-009](#) – Measurement of the differential Drell-Yan cross section in proton-proton collisions at $\sqrt{s} = 13$ TeV
- [CMS-PAS-SMP-16-012](#) – Search for anomalous couplings in semileptonic WW and WZ decays at $\sqrt{s} = 13$ TeV
- [CMS-PAS-SMP-15-012](#) – Measurement of the differential cross sections for pairs of Z bosons produced in association with jets in pp collisions at $\sqrt{s} = 8$ TeV
- [JHEP 03 \(2017\) 156](#) – Measurement and QCD analysis of double-differential inclusive jet cross-sections in pp collisions at $\sqrt{s} = 8$ TeV and ratios to 2.76 and 7 TeV

- [EPJC 77 \(2017\) 236](#) – Measurement of the WZ production cross section in pp collisions at $\sqrt{s} = 7$ and 8 TeV and search for anomalous triple gauge couplings
- [CMS-PAS-SMP-14-008](#) – Prospects for the study of vector boson scattering in same sign WW and WZ interactions at the HL-LHC with the upgraded CMS detector
- [EPJC \(2017\) 746](#) – Measurement of triple-differential dijet cross sections at 8 TeV with the CMS detector and constraints on parton distribution functions
- [PLB 772 \(2017\) 21-42](#) – Search for anomalous couplings in the production of WW and WZ pairs decaying semileptonically in proton-proton collisions at 8 TeV
- [CMS-PAS-SMP-16-008](#) – Determination of the strong coupling constant from the measurement of inclusive multijet event cross sections in pp collisions at 8 TeV
- [EPJC 78 \(2018\) 165](#) – Measurement of the ZZ production cross section, $Z \rightarrow 4\ell$ branching fraction and constraints on anomalous triple gauge couplings at 13 TeV
- [EPJC 78 \(2018\) 566](#) – Measurements of inclusive 2-jet, 3-jet and 4-jet azimuthal correlations in pp collisions at 13 TeV
- [EPJC 78 \(2018\) 589](#) – Electroweak production of two jets in association with a Z boson in proton-proton collisions at 13 TeV
- [PRL 120 \(2018\) 081801](#) – Observation of electroweak production of same-sign W boson pairs in the two jet and two same-sign lepton final state in proton-proton collisions at 13 TeV
- [PLB 774 \(2017\) 682](#) – Measurement of vector boson scattering and constraints on anomalous quartic couplings from events with four leptons and two jets in proton-proton collisions at 13 TeV
- [EPJC 78 \(2018\) 701](#) – Measurement of the weak mixing angle with the forward-backward asymmetry of Drell-Yan events at 8 TeV
- [JHEP 11 \(2018\) 113](#) – Measurement of the differential jet production cross section with respect to jet mass and transverse momentum in dijet events from pp collisions at 13 TeV
- [EPJ C 79 \(2019\) 773](#) – Azimuthal separation in nearly back-to-back jet topologies in inclusive 2- and 3-jet events in pp collisions at 13 TeV
- [EPJC 79 \(2019\) 269](#) – Measurement of associated production of W bosons with charm quarks in proton-proton collisions at 13 TeV with the CMS experiment at the LHC
- [EPJC 79 \(2019\) 20](#) – Measurement of the differential cross section for inclusive isolated photon and photon+jets production in proton-proton collisions at 13 TeV

Reports

- [arXiv:1803.07977](#) – Physics at TeV Colliders Standard Model Group Report – **Les Houches 2017**
- [EPJ WoC 95 04066 \(2015\)](#) – Search for a dileptonic edge with CMS – **ICNFP 2014**
- [CMS CR-2013-108](#) – V+jets at the LHC – **Moriond QCD 2013**
- [ISBN 978-1-4673-2028-3](#) – Mitigation of Anomalous APD Signals in the CMS ECAL – **IEEE 2012**
- [CMS CR-2011-139](#) – Performance of the CMS ECAL in LHC – **PANIC 2011**
- [AIP Conf. Proc. Vol. 1441 Issue 1 p.716](#) – Search for SUSY at CMS with ℓ or γ – **PANIC 2011**
- [J. Phys. Conf. Ser. 293 012042](#) – CMS ECAL status with the first LHC collisions – **CALOR 2010**