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Curriculum Vitae**PERSONAL DETAILS**

Name : Niki Saoulidou
Date/Place of Birth : December 8, 1974, Athens, Greece
Nationality, Gender : Greek, Female
Marital Status : Married and mother of an 12 year old son.
Spoken Languages : English, Greek
Mailing address : National University of Athens Physics Department
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EDUCATION

PhD Degree : University of Athens, Physics Department, Program of Graduate Studies in Nuclear and Particle Physics (1999-2003), PhD Thesis “Direct Observation of the Tau Neutrino” (DONUT, E872 experiment, Fermilab) (Advisor Prof.G. Tzanakos)
Master's Degree : University of Athens, Physics Department, Program of Graduate Studies in Nuclear and Particle Physics (1996-1999), (Grade 8.71/10.00). Master Thesis “Calibration of the Electromagnetic Calorimeter for the DONUT Experiment (E872, Fermilab)” (Advisor Prof. G. Tzanakos)
Bachelor's Degree : University of Athens, Physics Department (1992-1996) (Grade 8.43/10.00)

ACADEMIC POSITIONS

2018-present Associate Professor, Physics Department, University of Athens, Greece.
2011-2018 Assistant Professor (tenured July of 2015), Physics Department, University of Athens, Greece.
2006-2011 Wilson Fellow (fast tenure-track position equivalent to Assistant Professorship), FNAL, USA.
2003-2006 Postdoctoral Research Associate, FNAL, USA.
1996-2003 Graduate Research Assistant-Doctoral Student at the Physics Department, University of Athens, Program of Graduate Studies in Nuclear and Particle Physics.

AWARDS-SCHOLARSHIPS

2015 Recipient of the **2015 “Messiniako” Excellence Award in High Energy Physics**
Search committee: J.Iliopoulos, École Normale Supérieure, I.Bakas⁺ University of Patras, Greece, L. Resvanis, University of Athens, Greece, awarded by Nobel Prize Winner J. Cronin⁺
2009 Recipient of the **2009 EPS (European Physical Society) Young Physicist Prize** for the contributions to neutrino physics.
2006 Recipient of the **Martin and Beate Block Winter Fund Award** as the most promising young physicist.
2001-2002 Graduate research assistant, **funded by State Scholarship Foundation** (Greece).
1997-1999 Graduate research assistant, **funded by the General Secretariat of Research and Technology** (Greece).
1996 **Top undergraduate student (class of 300) in the senior year.** Scholarship awarded by the State Scholarship Foundation (Greece).
1993 **Top undergraduate student (class of 300) in the freshmen year.** Scholarship awarded by the State Scholarship Foundation (Greece).
1992 **Top ten high school students nation-wide** admitted at the Physics Department of NKUA (Greece)

LEADERSHIP - MANAGEMENT POSITIONS**Physics Department of NKUA**

- 2021-2024 **Elected member** of the Physics Department General Assembly
 2023- present **Member** of the Steering Committee for Doctoral Studies
 2018-2023 **Member** of the Steering Committee for Graduate Studies
 2014-2019 **Chair** of the Committee responsible for students with special needs

High Energy Physics Wide

- 2024-present **Member of the management Board of the LHC Physics Centre (LPC)** at Fermilab, USA
 2023-present **Chair of the Fermilab (US) Long Baseline Neutrino Committee (LBNC)**. The LBNC is charged by the Fermilab Director to review the scientific, technical, and managerial progress, plans and decisions associated with the Fermilab Long-Baseline Neutrino Facility (LBNF) and the Deep Underground Neutrino Experiment (DUNE)
 2019-present **Member of the Fermilab (US) Long Baseline Neutrino Committee (LBNC)**
 2023-present **Ex-officio member of Fermilab's Physics Advisory Committee (PAC)**, USA
 2023-present **Member of the F.R.S.-FNRS Scientific commission Sciences Exactes et Naturelles-2 (SEN-2)**, Belgium
 2020-2021 **Member of the Long-Range Planning Committee** of the Subatomic Physics Evaluation Section of the Natural Sciences and Engineering Research Council of Canada (NSERC) covering a period from 2022 through 2026 with a scope extending to 2036.
 2018 **Section Co-Chair for the 2018 Competition** of the Subatomic Physics Evaluation Section of the Natural Sciences and Engineering Research Council of Canada (NSERC)
 2016-2019 &
 2025 **Member of the Subatomic Physics Evaluation Section** of NSERC, Canada
 2013-2015 **Elected Member** of the Board of the Greek Society of High Energy Physics (EESFYE)
 2017-2018 **Elected Member** of the Board of the Greek Society of High Energy Physics (EESFYE)
 2019-present **Reviewer in HEP journals** JHEP, EPJC, SciPost, New Journal of Physics (NJP), J Phys G Nucl Part Phys
 2016-present **Reviewer of research proposals** submitted in the i) Swiss National Science Foundation, ii) Greece General Secretariat for Research and Technology, iii) Natural Sciences and Engineering Research Council Canada, iv) University Research Fellowship, Royal Society, UK v) Fund for Scientific Research-FNRS, Belgium, vi) Hellenic Foundation of Research and Innovation, Greece.

Experimental Collaboration Wide

- 2022-present **Member of the CMS Diversity Office**
 2022-present **Member of the CMS Conference Committee**
 2022-present **Member of the CMS Exotica/Beyond-Two-Generations Publications Committee**
 2021-present **Member of the CMS Implementation Team on Diversity and Inclusion**
 2019-2021 **Co-Convener(L2)** of the CMS Physics Analysis Group (PAG) "EXOTICA"
 2018-2020 **Member of the CMS Exotica/Beyond-Two-Generations Publications Committee**
 2011-present **Member of 22 CMS Analysis Review Committees (ARC)** : EXO-11-059, HIN-11-003, EXO-11-061, EXO-12-048, SMP-12-017, SMP-13-007, SMP-14-009, SMP-14-013, SUS-15-011, SUS-16-021, SUS-16-034, SUS-17-009, EXO-18-001, SUS-23-006 and **ARC chair** on:
 EXO-23-005, EXO-22-16, EXO-21-004, FTR-22-006, EXO-17-025, EXO-17-021, SMP-16-003, JME-15-001
 2014-2017 **Co-Convener(L3)** of the CMS PAG "Exotica new physics searches with Jets"
 2012-2014 **Co-Convener(L3)** of the CMS PAG "Standard Model Physics with Jets"
 2011-2013 **Co-Convener(L3)** of the CMS Physics Object Group "Jet Algorithms"
 2013-2015 **Responsible** of the particle flow reconstruction studies for the CMS HGCal upgrade proposal
 2007-2009 **Member of the MINOS Speakers Committee**
 2007-2009 **Co-Convener(L2)** of the Future Running Scenarios Physics Group of the MINOS experiment
 2006-2008. **Co-Convener(L2)** of the Neutral Current Physics Group of the MINOS experiment

Overview of CMS Physics Analysis, Physics Object, Trigger, Detector related activities

Physics Analysis Group Activities (PAG) (All related publications can be found in the relevant section on page 23)

Run III Datasets

- 2022-current **Main author** of the CMS search for new paired dijet resonances with the **2024 Run III dataset**. This is a novel analysis that showed a **very intriguing excess** with the Run II data, that we are now checking with Run III. My PhD student Ilias Zisopoulos, together with my MSc student Amalia Triantou are leading this search in the resonant production channel. This effort is expanded to include not only symmetric but also asymmetric decays for which now we are producing the corresponding signal samples to develop the analysis strategy
- 2022-current **Main author** of the CMS search for new dijet resonances with the **2024 Run III dataset**. Currently thoroughly studying data quality; doing so have uncovered subtle key trigger issue in 2022, and 2023 that CMS corrected in 2024. Plan to perform the search utilizing the ratio method I, with my formed PhD student Dr. D. Karasavvas, pioneered in Run II for both narrow and broad resonances with and without b-tagging. My PhD student Maria Kotsarini is leading the untagged version of this search together with senior Postdoc Dr. Eirini Tziaferi 2022-current
- 2022-current **Main author** of the CMS ttH, H->bbbar dileptonic measurement with **Run III data**. Together with my PhD students Polytimi Iosifidou and Haris Painesis studying the quality of Run III data, and co-developing in a new analysis framework with a columnar approach, utilized by the entire ttH, H->bbbar group, two novel methods introduced in Run II : The Tag-Rate-Function method that allows for a data-driven prediction of the main ttbar background, and the Higgs mass reconstruction that allows for an unbiased selection of the b-quark pairs coming from the Higgs decay. These were utilized in Run II and were also used for projections for the HL-LHC [**FTR-21-002**] showing that the analysis becomes statistics and not systematics limited.

Run II Datasets

- 2022- current **Main author** of the CMS search hunting for broad high mass paired dijet resonances with the full Run II dataset. This is a novel interpretation of the narrow search, performed for the first time at LHC. My PhD student Ilias Zisopoulos is leading this search.
- 2020-current **Main author** of the CMS search hunting for dijet resonances with the full Run II Scouting Dataset [**EXO-23-004**]. Proposed a new way of performing the search, overcoming hurdles in terms of the statistical treatment due to the very large statistics. Together with my group (Dr. Eirini Tziaferi, former PhD student Dr. Dimitris Karasavvas, PhD student Ilias Zisopoulos) have been contributing in several key areas of the search, co-authoring the relevant Analysis Notes.
- 2019-2021 **Main author** of the CMS search for paired dijet resonances with the full Run II dataset [**EXO 21-010**]. This is a novel analysis searching, for the first time at LHC, for resonant production in final states with at least four resolved jets. My former PhD student Dr. Magda Diamantopoulou was first appointed Analysis Contact, and after her graduation, Dr. Eirini Tziaferi, a senior Postdoctoral researcher of my group
- 2018-2024 **Main author** of the CMS ttH, H->bbbar dileptonic measurement with Run II data, and projections for Run III and HL-LHC [**HIG-19-011**] [**FTR-21-002**]. My formed PhD student Dr. Charis-Kleio Koraka led the implementation of two novel methods for conducting that measurement that yield significant reduction of the main systematic uncertainty predicted in a data-driven way and provide an unbiased reconstruction of the Higgs mass. These make the analysis from systematics to statistics limited for the HL-LHC era.
- 2017-2020 **Primary author (contact person)** of the CMS analyses searching for new dijet resonances [**EXO-17-026**] [**EXO-19-012**]. A novel background prediction method is introduced in this analysis reducing the main background systematic uncertainties. This yields to significant gains in sensitivity especially for wide resonances which are of particular interest to Dark Matter models.
- 2014-current **Core member** of the dijet resonance search group utilizing **offline** and **scouting jets** yielding,

- among others, the first LHC Publication at 13 TeV searching for new physics [EXO-15-001][EXO-16-032][EXO-16-056][EXO-17-026][EXO-19-012][EXO-20-008][EXO-23-004].
- 2010-2014 **Primary author (contact person) of two CMS SUSY di-lepton searches.** One hunting for third generation SUSY particles [SUS-13-016], and another hunting for generic opposite sign dilepton signatures but at low missing transverse energy [SUS-11-018] with the use of Artificial Neural Networks. **Main author, co-editor of the combination paper [SUS-14-010].**
- 2010-2014 **Primary author (contact person) of two CMS differential dijet cross-section measurements at 8 TeV [SMP-14-002] and the first CMS measurement at 7 TeV [QCD-10-025]. Main author in the corresponding follow-up measurement with the full 7 TeV dataset [QCD-11-004].**
- 2010-2011 **Core member of the CMS code development team optimized for SUSY searches**

Physics Object Group Activities/Responsibilities (POG)

- 2010-present **Responsible, together with my group, for the derivation, documentation, and support of Jet Identification criteria (JetID) for all jet collections, utilized by all CMS analyses.**
- Main author of the Detector Performance [DP] note on the determination of jet identification criteria with proton-proton collision at 13.6 TeV data collected with the CMS detector at the CERN LHC [CERN-CMS-DP-2024-028]**
- Main author of the publication on CMS PF PUPPI jet identification Criteria & performance [JME-18-001]**
- Main author of the Physics Analysis Summary [PAS] on CMS PF and Calorimeter jet identification Criteria [CMS-PAS-JME-16-003]**
- 2010-present **Key member, together with my group, of the group responsible for the jet energy scale determination, resolution and performance.**
- Since 2018 responsible, together with my group, for the derivation, documentation, and support of baseline jet energy corrections utilized by all CMS analyses.**
- Main author of the DP note on Jet Energy Scale and Resolution Measurements Using Prompt Run3 Data Collected by CMS in the First Months of 2022 at 13.6 TeV [CMS-DP-2022-054]**
- Main author of the DP note on Jet energy scale and resolution measurement with Run~2 Legacy Data Collected by CMS at 13 TeV [CMS-DP-2021-033]**
- co-Editor of the first CMS publication on jet energy scale and resolution determination [JINST 6 (2011) P11002]**
- Primary author (contact person) of the first CMS PAS on 7 TeV determination of jet resolutions [CMS-PAS-JME-10-014].**
- Main author of the PAS first CMS PAS on jet performance studies at 0.9 and 2.36 TeV [CMS-PAS-JME-10-001]**
- Main author of the PAS Performance of Missing Transverse Energy Reconstruction in sqrt(s) = 900 and 2360 GeV pp Collision Data [CMS-PAS-JME-10-002]**
- Main author of the PAS CMS Jet Performance in pp Collisions at sqrt(s)=7 TeV [CMS-PAS-JME-10-003]**
- Main author of the PAS CMS MET Performance in Minimum-Bias and Jet Events from pp Collisions at sqrt(s) = 7 TeV [CMS-PAS-JME-10-004]**
- Main author of the PAS Jet Energy Resolution in CMS at sqrt(s) = 7 TeV [CMS-PAS-JME-10-014]**

Trigger Related Activities/Responsibilities (HLT & L1)

2020-present High Level Trigger

Since 2024 responsible, together with my group, for the online and offline Data Quality Monitoring of Scouting (HLT) jets, and the derivation of JetID for Scouting (HLT) jets
Between 2020-2022 key member of the group that studied in detail the performance of Scouting (HLT) PF Jets, under different reconstruction conditions on GPUs, in preparation for Run III and HL-LHC.

Main author on CMS DP note on PF Jet Performances at High Level Trigger using Patatrack pixel tracks
[CMS-DP-2021-005]

2018-present L1 Trigger

Since 2018 responsible, together with my group, for the L1 EGAMMA and TAU trigger performance

Main author of DP Note on Performance of Level-1 trigger e/gamma and tau in Run 3,
[CERN-CMS-DP-2023-008]

Main author of the publication on the Performance of the CMS Level-1 trigger in proton-proton collisions at $\sqrt{s} = 13$ TeV, CMS Collaboration,
[JINST 15 (2020) 10, P10017]

Main author of DP Note on Level-1 Calorimeter Trigger Performance
[CERN-CMS-DP-2018-040]

Detector Upgrades

2013-2016 **Key member of the CMS High Granularity Calorimeter (HGAL) group.** Led the work for porting, further developing and utilizing the PandoraPFA particle flow algorithm, in exploiting and studying the performance of a high granularity forward calorimeter (HGAL) for the CMS Phase II upgrades. Developed all needed analysis tools and conducted jet, photon and electron related performance studies with HGAL. **These studies were documented and presented to the CMS collaboration and were critical for its decisions in 2014 and 2015 as to which of the initially three (2014) and then two (2015) proposed detectors for the High Luminosity LHC (HL-LHC) upgrades would go forward.** The HGAL proposal was chosen in April of 2015 by the CMS collaboration as the forward calorimeter upgrade option for the HL-LHC running period.

Main author of the publication on HGAL: A high Granularity Calorimeter for the endcaps of CMS at HL-LHC,
[JINST 12 (2017) no.01]

MEMBERSHIP IN SCIENTIFIC COLLABORATIONS

DUNE (2016-Present)
CMS (2009-Present)
NOvA (2007-2010)
MINOS (2003-2010)
DONUT (1994-2003)

FUNDED PROPOSALS (Physics Department, NKUA) [Total of 1.63 M Euro as PI]

2023-2025 Primary Investigator (PI) of the 5th Call for Action “Science and Society” – “Always Strive for Excellence-Theodore Papazoglou” (co-funded by the Stavros Niarchos Foundation and H.F.R.I.) Competitive EU - National funding

Budget : 1.1 M Euro for 2.5 years due to “Seal of Excellence” in ERC 2023 Advanced Grant Cycle

2022-2024 Member of the Scientific Board, together with Prof. Jose Valle, IFIC, Universita Di Valencia, Spain, of an Hellenic Foundation for Research and Innovation (H.F.R.I) research grant for Postdoctoral researchers. **Competitive National funding**

Proposal ranked **1st in HEP Nation-Wide** and **7th in the “Physical Sciences” Nation-Wide.**

Budget 110.000 Euros

2020-2023 Primary Investigator (PI) of an H.F.R.I research grant. Competitive National funding

Proposal ranked **1st in HEP Nation-Wide** and **6th in the “Physical Sciences” Nation-Wide.**

Budget 200.000 Euros

2018-2021 Primary Investigator (PI) of a State Scholarship Foundation (IKY) research grant for PhD students (2018-2021). Competitive National funding

The scholarship was awarded to my PhD Student Charis Kleio Koraka working on the CMS experiment on Higgs searches.

Budget 30.000 Euros

2017-2022 Primary Investigator (PI) of a “Niarchos Foundation Research Excellence Grant” (SNF)

Budget 200.000 Euros

2011-2015 Member of a “Thalis” research grant awarded by the General Secretariat of Research and Technology (2011-2015). **Competitive National funding**

Total Budget 500.000 Euros for three nodes

2011-2015 Member of an “Aristeia” research grant awarded by the General Secretariat of Research and Technology (2011-2015). **Competitive National funding**

Total budget 400.000 Euros

TEACHING EXPERIENCE

2011 – current: Teaching core courses (classes of ~150 for Physics Majors) :

- i) Physics III (electromagnetism)
- ii) Physics IV (Modern Physics, Introduction to Quantum Mechanics)
- iii) Nuclear Physics Labs
- iv) Advanced Nuclear and Particle Physics Labs with related small research projects
- v) Lecture/course on the most recent developments in high energy physics.

2011 – 2017 : Participated, giving lectures, in outreach events in the context of the European Particle Physics Outreach Group (EPPOG) “Master Class” activity organized by the Physics department of the University of Athens, Greece

2006 – 2007 : Participated in Fermilab's educational program in conjunction with the Illinois Mathematics and Science Academy. Supervised two exceptional senior High School students one of which was selected to participate in the national high school conference to present the work we conducted together on the MINOS experiment. Following the presentation in the national high school conference the student was finally selected to visit a related workshop at KEK, Japan in order to present and further discuss the results of this work.

2003 – 2005: Participated in Fermilab's Educational Program: "Saturday Morning Physics". This included tours and discussions on various Fermilab Experiments and Projects.

1997 – 2002: Teaching assistant for undergraduate students at the University of Athens, Physics Department

Laboratories (Mechanics, Thermodynamics, Nuclear Physics and Advanced Nuclear Physics)

PHYSICS OUTREACH

- 1) "The big experiments at the LHC", EPOG Master Class Seminars, National and Kapodistrian University of Athens, Greece, 2017, 2016, 2015, 2014, 2013, 2012
- 2) "The big experiments at the LHC", 2013-present, Several Public Schools in Zografou Area, Private Schools Ellhnogermaniki Agogh and Ellhnogalliki Sxolh.

STUDENT AND POSTDOC OFFICIAL SUPERVISION AND MENTORING:

In the context of the MINOS, NOvA and CMS experiments, and from the physics leadership positions I held, I have unofficially co-supervised and mentored numerous young students and postdocs that advanced in their careers both in and outside Academia. Below I list only the ones for which I was officially responsible.

Supervision: Postdoctoral Researchers (4)

1) Dr. E. Tzovara (PhD Johannes Gutenberg University Mainz, Germany) March 2024-present: **NKUA Postdoctoral Researcher on CMS (H.F.R.I research grant).**

Dr. Tzovara is now leading the development of offline and online Data Quality Monitoring for CMS Scouting (HLT level) jets, and the development of Jet identification criteria. Due to her key contributions she is already nominated for the Jet Scouting Contact position of the CMS JetMET group.

2) Dr. D. Papoulias (PhD Univ. of Ioannina, Greece) 2022-2024: **NKUA Postdoctoral Researcher and PI of the H.F.R.I Research Grant "Astroparticle Physics Probes with the DUNE Experiment" 2024-Present : Postdoctoral Researcher at IFIC, Spain**

3) Dr. E. Tziaferi (PhD Univ. of Sheffield, UK) 2014-present: University of Ioannina and NKUA **Senior Postdoctoral Researcher on CMS (with Thalys, Aristeia, H.F.R.I research grants):** *Former co-convener of the CMS "Jets+X" physics analysis sub-group (PAG) (2021-2023). "Jets+X" is one of the three sub-groups of the CMS EXOTICA PAG. EXOTICA is one of the largest CMS Physics Analysis Groups searching for new physics. Previously served (2017-2021) as the EXOTICA Jet Object Expert/Contact. Since 2014 co-leader of the CMS JETMET jet Identification object group, and key analyzer of the Exotica Dijet and paired Dijet resonance search physics analysis group.*

2024-present: Elected Assistant Professor at Democritus Univ. of Thrace, Greece

4) Dr. A. Psallidas (PhD Univ. of Patras, Greece) 2013 - 2015: NCSR Demokritos, Greece **Postdoctoral Researcher on CMS (with Thalys research grant):** worked together (core members) on the CMS High Granularity Calorimeter (HGCAL) upgrade project for HL-LHC.

2016-2022: Postdoctoral researcher at National Taiwan University, based at CERN and Monte Carlo generator contact for the HGCAL simulation and performance group.

2022-Present: Researcher C (eq. Assistant Professorship) at NCSR Demokritos, Greece, joined ATLAS

Main Supervision: PhD Students (8 : 5 ongoing, 3 completed)

2024-present Polytimi Iosifidou, CMS Experiment, *supported by an H.F.R.I Research Grant.*

Key member of the $t\bar{t}H$, $H \rightarrow b\bar{b}$ measurement in the dileptonic channel with Run II and Run III data estimating trigger scale factors and working on a novel mass reconstruction approach. Also working on detailed studies of the L1 Tau Triggers of the CMS experiment

Top 1% of her class, Bachelors grade 9.0/10 (4 years), MSc grade 9.44/10 (1.5 years)

2024-present Kotsarini, CMS Experiment, *supported by an H.F.R.I Research Grant.*

Key member of the dijet resonance search with the Run III datasets, and working on the development and extraction of jet identification criteria (JETID) for the entire CMS Collaboration. Due to her key contributions and expertise she is not appointed at the Jet Contact of the CMS EXOTICA PAG.

Top 10% of her class, Bachelors grade 7.0/10 (4.5 years), MSc grade 8.44/10 (1.5 years)

2023-present Z. Painesis, CMS Experiment, *supported by an H.F.R.I Research Grant.*

Key member of the $t\bar{t}H$, $H \rightarrow b\bar{b}$ measurement in the dileptonic channel with Run II and Run III data,

working on a novel $t\bar{t}$ prediction approach. Also key member of the group that is performing detailed studies of the $L1$ Electron – Photon Triggers of the CMS experiment

Top 10% of his class, Bachelor's grade 7.9/10 (5.5 years), MSc grade 9/10 (1.5 years)

2021- present PhD Candidate I. Zisopoulos, CMS Experiment, *supported by an H.F.R.I Research Grant.*

Key member of the paired dijet resonance search with Run II and Run III datasets, responsible for the development and extraction of jet energy corrections (JEC) for the entire CMS Collaboration. Since 2024 serving as the JetMET Contact of the B2G PAG.

Top 1% of his class: Bachelors grade: 8.9/10 (4.5 years), MSc Grade 8.8/10 (1.5 years).

2020- present PhD Candidate P. Melas, DUNE Experiment, *supported by an H.F.R.I Research Grant.*

Performing the first measurement of cosmic muon seasonal variation with the ProtoDUNE experiment at CERN, contributing to the installation of the 2X2 Near Detector (ND) Prototype at FNAL, conducting and publishing novel new physics searches with the DUNE ND.

Top 10% of his class: Bachelors grade 7.3/10 (4.5 years), MSc grade: 8.7/10 (1.5 years)

2023/9-2023/12 **Fermilab Neutrino Physics Center (FNC) Fellowship**

2018- 2021 Dr. C.K. Koraka, *Scholarship by National Scholarship Foundation, Greece*

“Study of the Higgs boson production in association with two top quarks and its subsequent decay to a $b\bar{b}$ pair with the CMS detector at the CERN LHC”

Top 1% of her class: Bachelors grade 8.8/10 (4.5 years) , MSc grade 8.8/10 (1.5 years).

Now Postdoctoral Researcher at CMS with the University of Wisconsin Madison, US) and **L3 co-convener of the CMS B2G VHF subgroup)**

2018-2022 Dr. D. Karasavvas, *Scholarship from Niarchos Foundation Research Excellence Grant,*

“Search for narrow and wide resonances, focusing on dark matter mediators, in dijet events with the CMS experiment at the CERN Large Hadron Collider”

Top 5% of his class: Bachelors grade 8.1/10 (4.5 years) , MSc grade 9.1/10 (1.5 years) .

Now in Private Sector, Data Scientist, BigData analysis, Application of ML & AI techniques, Group Leader.

2017-2021 Dr. M.M. Diamantopoulou , *Scholarship from Niarchos Foundation Research Excellence Grant,*

“Search for resonances in dijet and multijet events from proton-proton collisions at a center of mass energy of 13 TeV collected with the CMS detector at the CERN LHC”

Top 5% of her class: Bachelors grade 7.8/10 (4.5 years), MSc grade 8.2/10 (1.5 years).

Now Postdoctoral Researcher at ATLAS with Carleton University, Canada and **L3 co-convener of the ATLAS JEC In-Situ group)**

Main Supervision: Master Students (13)

2024-present Evgenios Kritikos, MSc in CMS, *supported by an H.F.R.I Research Grant.*

MSc student, top 1%, Bachelor's grade 9.2/10 (5 years)

2023-present Amalia Triantou, MSc in CMS, *supported by an H.F.R.I Research Grant.*

MSc student, top 5%, Bachelor's grade 8.19/10 (5 years)

2023-present Aikaterini Karmi, MSc in CMS, *Supported by an H.F.R.I Research Grant.*

MSc student, top 20%, Bachelor's grade 8.14/10 (8 years)

2022-2024 Polytimi Iosifidou, MSc in CMS, *supported by an H.F.R.I Research Grant.*

Now PhD Candidate at NKUA (see above)

2022-2024 Pavlos Panos, MSc in CMS, *supported by an H.F.R.I Research Grant.*

MSc, Top 1%, Bachelors grade 8.95/10 (4 years), MSc grade 9.5/10 (1.5 years)

2022-2024 Maria Kotsarini, MSc in CMS, *supported by an H.F.R.I Research Grant.*

Now PhD Candidate at NKUA (see above)

2021-2023 Zacharias Painesis, MSc in CMS, *supported by an H.F.R.I Research Grant.*
Now PhD Candidate at NKUA (see above)

2020-2022 Michail. Madianos, MSc in CMS, *supported by an H.F.R.I Research Grant.*
Top 1% of his class: Bachelors grade 8.9/10 (4 years).
Now in Private Sector, Data Scientist, BigData analysis, Application of ML & AI techniques

2019-2021 Ilias Zisopoulos, MSc in CMS
Now PhD Candidate at NKUA (see above)

2018-2020 Pantelis Melas, MSc in ProtoDUNE
Now PhD Candidate at NKUA (see above)

2016-2018 Charis-Kleio Koraka, MSc in CMS
Continued & completed her PhD at NKUA under my Supervision, now Postdoctoral Researcher with the University of Wisconsin Madison, USA (see above)

2016-2018 Dimitrios Karasavvas, MSc in CMS
Continued & completed his PhD at NKUA under my Supervision, now in the Private Sector, Data Scientist, BigData analysis & Application of ML & AI techniques (see above)

2015-2017 Melpomeni Magdalini Diamantopoulou, MSc in CMS
Continued & completed her PhD at NKUA under my Supervision, now Postdoctoral Researcher with the University of Carleton, Canada (see above)

2011-2014 Manuel Chaniotakis MSc in CMS, *Supported by State Scholarship Foundation.*
Now in Private Sector working on R&D for Science Educations

Main Supervision: Undergraduate Students (20)

2024-present Zisimos Aggelopoulos, Diploma thesis in CMS
Fourth year undergraduate, top 5%, Bachelor's grade 8.1/10, expected duration of studies :4-5 years

2024-present Olympia-Paraskevi Katseli, Diploma thesis in CMS
Fourth year undergraduate, top 5%, Bachelor's grade 8.5/10, expected duration of studies :4-5 years

2024-present Georgia Lagounari, Diploma thesis in DUNE
Fourth year undergraduate, top 20%, Bachelor's grade 7/10, expected duration of studies :5-6 years

2023-present Nektarios Kosteletos, Diploma thesis in CMS
Fourth year undergraduate, top 5%, Bachelor's grade 8.6/10, expected duration of studies :4 years

2023-present Dimitrios Krokos, Senior Research Project in CMS
Senior undergraduate, top 20%, Bachelor's grade 7.2/10, expected duration of studies: 5.5 years

2022-2024 Eugenios Kritikos, Diploma thesis in CMS, now MSc student (CMS) at the Physics Department, NKUA, Graduate School

2022-present Amalia Triantou, Diploma thesis in CMS, now MSc student (CMS) at the Physics Department, NKUA, Graduate School

2020-2022 Polytimi Iosifidou, Diploma thesis in CMS, MSc in CMS, now a PhD Student at the Physics Department, NKUA, Graduate School

2020-2022 Pavlos Panos, Diploma thesis in CMS, MSc in CMS, NKUA

2020-2021 Maria Kotsarini, Diploma thesis in CMS. MSc in CMS, now a PhD Student at the Physics

Department, NKUA, Graduate School

2020-2021 Haris Painesis, Diploma thesis in CMS. MSc in CMS, now a PhD Student at the Physics Department, NKUA, Graduate School

2019-2021 Michail Madianos, Diploma thesis in CMS. Completed his MSc at the Physics Department, NKUA, Graduate School

2019-2020 Dimitrios Ntounis, Diploma thesis in CMS,
Top<<1%, Bachelor's grade 9.9/10, Admitted at Stanford Physics Department Graduate School

2018-2019 Pantelis Melas, Diploma thesis in DUNE. MSc in DUNE, now a PhD Student at the Physics Department, NKUA, Graduate School

2017-2019 Ilias Zisopoulos, Diploma thesis in CMS. MSc in CMS, now a PhD Student at the Physics Department, NKUA, Graduate School

2017-2018. Kyriakos Demeroykas, Diploma thesis in CMS. Now in Graduated School in Data Science in Bath, UK.
Top 5% of, average grade 8/10 (4 years).

2014-2016 Dimitrios Karasavvas, Diploma thesis in CMS. Completed his PhD at the Physics Department, NKUA, Graduate School

2013-2015 Magda Diamantopoulou, Diploma thesis in CMS. Completed his PhD at the Physics Department, NKUA, Graduate School

2013-2015 Etyxia Sagkrioti, Diploma Thesis in CMS, Completed her PhD in theoretical physics at the Physics Department, NKUA, Graduate School. Now obtaining MSc in bioinformatics and Computation Biology at NKUA, Greece.
Top 5% Bachelors grade 8/10(4 years).

2011-2012 M. Boura-Vistalina, Diploma Thesis in CMS, Completed her MSc at the Physics Department, NKUA, Graduate School
Top 5% Bachelors grade 7.8/10 (4.5 years).

MSc steering committee:

- G. Karathanasis (Completed MSc in CMS 2012-2015)
- A. Stakia (Completed MSc in CMS 2013-2015)
- P. Kontaxakis (Completed MSc in CMS 2013-2015)

PhD steering committee:

- G. Flouris (PhD in CMS 2012- 2016, now working the private sector)
- A. Agapitos (PhD in CMS 2012- 2016, now a Postdoctoral researcher at the University of Peking, China)
- A. Stakia (PhD candidate in CMS 2015-current)
- G. Karathanasis (PhD candidate in CMS 2015-2023 now a Postdoctoral researcher at the University of Colorado, USA)
- W. Karageorgos (PhD candidate in CMS 2011-current)

PhD evaluation committee:

- Dr. Georgios Panopoulos (2022, NKUA)
- Dr. Emmanouil Vourliotis (2022, NKUA, now a Postdoctoral Researcher in UCSD,USA)
- Dr. Luigi Sabetta (2022, Sapienza, Universita Di Roma, Italy)
- Dr. Martina Vit (2021, Ghent University, Belgium)
- Dr. E. Hansen (2020, Lund University, Sweden, now a Postdoctoral researcher at the University of Manchester, UK)

- Dr. E. Sagkrioti (2020, NKUA, now obtaining MSc in bioinformatics and Computation Biology at NKUA, Greece)
- Dr. E. Romero (2017, University of Valencia, Spain)
- Dr. S. Angelidakis (2016, NKUA, Greece, now a Postdoctoral researcher at NKUA, Greece)
- Dr. N. Tsirintanis (2016, NKUA, Greece)
- Dr. K. Iordanidou (2015, NKUA, Greece, now a Senior Data Scientist, Accenture, Zurich, Switzerland)
- Dr. A. Antonaki (2014, NKUA, Greece)
- Dr. L. Gouskos (2014, NKUA, Greece, now Research Staff at CERN)
- Dr. Emma Torro Pastor (2013, University of Valencia, Spain, now a Distinguished Researcher at Instituto de Física Corpuscular (IFIC), Spain)

COMPUTING SKILLS:

Advanced experience in scientific programming in C, C++, Python and Fortran. Advanced experience on statistical analysis and on the development of Multivariate Analysis Techniques (artificial neural networks, boosted decision trees, k-nearest neighbors etc) for physics analysis. Advanced experience on the implementation of clustering techniques with the use of minimal spanning trees. Advanced experience on administration and maintenance of Linux, MAC and WinNT workstations. Advanced experience on editing and image processing packages and working experience on development and maintenance of web pages.

HIGHLIGHTS OF RESEARCH ACTIVITIES (1994-Present)

The main motivation and guiding principle in my research career so far is to conduct discovery physics, having difficult problems to solve and unanswered questions to investigate. I focused for many years (1994-2010) on the detailed study of the most elusive and enigmatic particle of the Standard Model, the neutrino, and in the past fifteen years (~2009-present) on the hunt for Dark Matter and new particles and new forces at the LHC in a model dependent top-down approach with dedicated searches, but also a model independent bottoms-up one.

Doing so, I combine hard and meticulous work, with the ability to pioneer, lead and contribute significantly to impactful projects that include the design, optimization and proposal of new experiments [NOvA ND, DUSEL], new detectors [CMS HGCAL], novel new physics searches [numerous neutrino oscillation and collider “exotic” searches hunting for new particles] and novel analysis methodologies aiming at aggressively reducing systematic uncertainties [matrix method, ratio method,] described in detail below.

Novel New Physics Searches: in the DONUT experiment, in 2000 as a PhD student, I introduced artificial neural networks (ANNs) in several aspects of the analysis, something that very few analyses were doing at the time. As a postdoc at the MINOS experiment (2003-2006), I developed a new data-driven method for performing the main oscillation analysis, called the “matrix method”, significantly reducing systematic uncertainties, that has been used for all publications ever since. Then, as a Wilson Fellow and Assist. Prof. in the CMS experiment I introduced both ANNs and a novel, entirely data-driven, method for hunting for Supersymmetry significantly extending the reach at events with low missing transverse energy (2010-2013 *analysis contact*), something that since then has been pursued at large. At the same time, I performed first CMS SM measurements with jets (*analysis contact, co-convener of the relevant group*). Then, as an Assist. and Assoc. Prof., I pioneered together with my former PhD student D. Karasavvas (2016-2019 *analysis contact*), a new novel data-driven method for predicting the main QCD background in the Dijet resonance searches. This significantly enhanced (by factors of two) the discovery potential for broad resonances, which are key for discovering Dark Matter and Lepton Flavour Violating phenomena. Then (2019-2022), as an Assoc. Prof., I co-lead and developed together with my group (former PhD student M. Diamantopoulou, my postdoc Dr. E. Tziaferi, graduate student I. Zisopoulos, undergraduate students D.Ntounis and M. Kotsarini) and in Collaboration with research teams from Fermilab (Dr. R.Harris, Dr. B. Dobrescu, Dr. J. Isaacson) and Rutgers (Prof. E. Halkiadakis, Dr. M. Osherson, and undergraduate student T.Wai) a new and novel analysis performed for the first time at LHC, targeting resonant production of paired dijet resonances (*PhD student Magda Diamantopoulou and now Postdoctoral researcher Dr. E. Tziaferi are the analysis contacts*) yielding a very intriguing excess we are currently investigating with Run III data. In parallel (2018-2021), as an Assoc. Prof I lead, together with my former PhD student C.K.Koraka and in collaboration with groups from NCSR Institute (Dr. Georgios

Anagnostou and Dr. Georgios Daskalakis), the development and implementation of a novel way of performing the $t\bar{t}H$, $H \rightarrow b\bar{b}$ measurement, utilizing a new data-driven method for obtaining the main $t\bar{t}$ background making the analysis from systematics, statistics limited and : this was used for making projections for the HL-LHC (*former PhD student Charis Kleio Koraka as the analysis contact*), and is now utilized with Run III data (*PhD students Haris Painesis and Polytimi Iosifidou leading this*). Since 2020, co-leading, together with my group, and in collaboration with Dr. Robert Harris and Dr. Ali Eren Simsek, the full Run II resonance search with data-scouting, introducing a new way of conducting the analysis overcoming fitting difficulties due to the very large statistics. Since 2022 introducing and co-leading, together with my group, and in collaboration with Dr. Robert Harris and Dr. Bogdan Dobrescu, new searches for multi-jet resonances conducted at LHC for the first time.

New Experiments, New Detector concepts: in 2007-2008 I was in a team of few that developed and proposed the idea of the DUNE (then DUSEL) experiment, in 2007-2009 I led the optimization of the NOvA Near Detector, and in 2013-2016 I was a key member in a group of less-then-ten CMS Colleagues that aggressively pursued the CMS HGCAL (then PFCAL), forward calorimeter upgrade option for the HL-LHC era.

Novel Physics Objects : starting in 2010 in CMS I lead the commissioning of Particle Flow jets with the first collision data, proving their excellent quality and pioneering the development of PF jet identification criteria (*co-convener of the relevant group*), which are used by all CMS physics analyses to date. Since then my group, and specifically senior Postdoctoral Researcher Dr. Eirini Tziaferi and PhD Maria Kotsarini, are leading those in CMS. Since 2018 leading detailed studies, together with my group and specifically former PhD student Dr. Magda Diamantopoulou and PhD Student Ilias Zisopoulos, of PUPPI PF Jets, both in terms of their performance and in terms of energy correction derivations and optimizations. Between 2020 and 2022 led the performance and optimization studies of novel PF jets at the HLT (*PhD student D. Karasavvas was the analysis contact*) that showed they are of high quality and can be utilized for physics searches with jets in Run III and HL-LHC. Since 2024, leading, together with Postdoctoral Researcher Dr. Eftychia Tzovara, the work towards developing online and offline Data Quality Monitoring for PF Jets at the HLT, as well JetID criteria to be utilized both online and offline.

DETAILED RESEARCH ACTIVITIES IN COLLIDER PHYSICS (2009-present) :

The LHC currently provides proton-proton collisions at 13 TeV, and soon at 13,6 TeV, the highest energies to date, enabling experiments to test and probe the Standard Model (SM) at unprecedented scales. LHC experiments can test a variety of plausible extensions to the SM, like supersymmetry, new extra dimensions, technicolor, contact interactions, new fermionic matter, heavy Majorana neutrinos, Dark Matter, Dark sector particles, and many others, and hence provide a unique path for discovery through an extremely rich physics program for decades to come.

Searches for New Physics (2010-Present):

- **Co-leader the CMS EXOTICA physics analysis group (PAG) [co-convener: 2019-2021]**, one of the largest groups hunting for new physics in a variety of final states, interpreting in a plethora of new physics models. This group hosted approximately 130 analyses (> 600 Colleagues) categorized in four sub-groups according to the event final state: “Jets+X”, “MET+X”, “non-Hadronic” and “Long-Lived”. It covers many possible new physics signals, including ones from new extra dimensions, new interactions and additional gauge bosons, quark compositeness, new fermionic matter, heavy Majorana neutrinos, Dark Matter and Dark sector particles, lepto-quarks, additional Higgs particles from several SM extensions and others. **As the CMS EXOTICA group co-convener (2019-2021) (L2 position), I coordinated and lead the group by following the progress of all analysis sub-groups, preparing the publication planning, determining high-profile analyses and publications, making sure results with high physics impact are approved and shown in all major international conferences, carefully select sub-group conveners (L3s), contacts, experts, but also place requests for necessary resources, such as triggers, simulated samples, and calibrations, and guide CMS analysis till the final approval. My term as the EXOTICA coincided with the start and peak of the devastating covid-19 pandemic. Yet, despite this, the EXOTICA group had one of its most productive periods with, just as an example, thirteen new results completed and presented in large**

international conferences in the Spring-Summer of 2021.

- **Co-leader of the CMS Exotica “Jets+X” PAG sub-group [co-convener: 2014-2017]**, that hosts searches for new physics (NP) with jets in the final state, with ~ 15 analyses and ~ 80 members. These include critical new physics searches like: i) the hunt for dark matter utilizing events with two resolved jets or one large cone-size jet in the final state ii) the model independent narrow and wide dijet resonance searches targeting a variety of new physics models like RS gravitons, excited quarks, W' , Z' iii) the multi-jet searches for extra-dimensions, mini black holes, R-parity violating SUSY, diquarks iv) the searches for heavy neutrinos and right-handed W_R , lepto-quarks, excited leptons, SUEPs etc. **Worth noting that six out of the ten CMS Exotica “High Priority Analyses” (HPA)**, which presented the **first Run II results in December of 2015 at CERN**, were conducted within this group, along with the **first Run II LHC publication on NP searches (dijet narrow resonance search)**.
- **High & medium mass dijet resonance searches [2013-present]** : In 2013 I joined the core analysis team of the dijet resonance searches in the “Jets+X” exotica subgroup. This is a model independent search for new physics hunting for resonances in the invariant dijet mass spectrum. It is one of the ten high priority analyses of the CMS Exotica group and **yielded the first CMS and LHC publication on new physics searches with the Run II data**. It is now also one of the **most sensitive analysis hunting for dark matter production, through its mediator, at hadron colliders**. As such, it has been and still is presented in several major conferences (LHCP 2015, LHC CERN Jamboree 2015, Moriond 2016, ICHEP 2016, Moriond 2017, EPS 2017, LHCP 2018, Moriond2019, LHCP 2020, EPS-HEP 2021, ICHEP2022, ICHEP2024)
Together with my PhD students Magda Diamantopoulou and Dimitrios Karasavvas, and Postdoctoral researcher Dr. Eirini Tziaferi, I played a **leading role in these searches, contributing to all aspects of the analysis**:
 - co-led the development of all needed analysis tools, coordinated, completed and documented a large set of optimization studies for both the high (>1.2 TeV) and the low (600 GeV – 2 TeV) mass search
 - performed, presented and documented all commissioning, data-quality and trigger related studies
 - proposed and led the development of a very robust, complementary analysis methodology utilizing a data-driven method for prediction the main QCD SM background, called the “ratio method”. This is now the main analysis method for the high mass search yielding significantly increased sensitivity, by up to factors of two, especially for wide resonances. This complementary analysis method is also critical in case we observe a signal, due to the fact that it yields higher signal significances due to smaller systematic uncertainties. The publication is highly cited, and the results, both the preliminary and the full Run II ones, have been presented in several high-profile conferences PIC2018, DISCRETE2018, Moriond2019, LHCP2020, EPS-HEP 2021, ICHEP2022, LHCP2023, and other conferences.

Now, together with my **group** (Dr. Eirini Tziaferi, PhD student Maria Kotsarini, undergraduate student Evgenios Kritikos, MSc Amalia Triantou) **leading the analysis of Run III data**, with a goal to **improve the physics reach by further reducing systematic uncertainties**.

- **High mass paired dijet resonance searches [2019-present]** : Since 2019, given the very unusual highest dijet mass event we observed and published in the context of the high mass dijet resonance search, and given also the clustering of events with dijet masses close to 8 TeV from both the ATLAS and CMS Collaboration I **co-led and developed together with my group** (Dr. Eirini Tziaferi, PhD students Magda Diamantopoulou and Ilias Zisopoulos, and undergraduate students Maria Kotsarini and Dimitrios Ntounis) and **in Collaboration with Colleagues from Fermilab and Rutgers, a novel paired dijet resonant search targeting such signatures**. This analysis, which yielded a local (global) excess of 3.9σ (1.6σ), is approved, presented and highlighted in Moriond 2022, ICHEP 2022, and a **CERN-Courier article with the title “Dijet excess intrigues at CMS” CERN courier article**, <https://cerncourier.com/a/dijet-excess-intrigues-at-cms>. We are, of course, eagerly awaiting to **conduct the Run III search at 13,6 TeV, to see if this is a statistical fluctuation or new physics**.

Now analysing Run III data (Dr. Eirini Tziaferi, PhD student Ilias Zisopoulos, MSc student Amalia Triantou, MSc student Aikaterini Karimi), with a goal to **publish our findings** with $\sim 120 \text{ fb}^{-1}$ of data, where we expect **> 3 sigma significance** if the excess is due to new physics. In addition, planning to **expand on new and novel final states** in close **collaboration with theorists (Dr. Bogdan Dobrescu, Fermilab Theory Division), and the Fermilab (lead by Robert Harris) and the Rutgers (lead by Eva Halkiadakis and Yuri Gerstein) experimental groups.** Ilias Zisopoulos, is awarded the ICHEP2024 talk on search for new resonances due to his major contributions in this area.

- **Medium mass dijet resonance search with full Run II Scouting data [2019-present]:** Since 2019 also working, together with Dr. E. Tziaferi, PhD student Ilias Zisopoulos, former PhD students Magda Diamantopoulou and Dimitrios Karasavvas, Dr. Robert Harris (Fermilab) and PhD student Ali-Eren Simsek (Cukurova University) on **completing the hunt for dijet resonances using the full Run II “Scouting” data-set.** Scouting data are a novel way CMS introduced on saving only the minimal and needed information on an event, resulting in the event size being significantly reduced thus allowing for much lower trigger thresholds. These data allow us to probe **thus far unexplored regions of parameter space at lower particle masses and weaker couplings**, and hence enlarge significantly our new physics discovery potential. **With this search, and the new way statistical way I introduced on performing the analysis, which is now post pre-approval stage, we will significantly push the limits on cross sections, DM interpretations, and masses of new particles predicted by several new physics models.**
- **Supersymmetry (2010-2013):** Performed pioneering work on NP searches using advanced multivariate techniques with the first LHC data. In 2010, led, developed and performed an inclusive analysis utilizing events with at least two **opposite-sign (OS) leptons** and two jets in the final state, and relatively **low missing transverse energy (MET)**, using the **discriminating power of Artificial Neural Networks (ANNs)** to differentiate signal events from the large SM background in this region of phase space. This multivariate analysis **was more sensitive in the high MET region, but also had significant discovery potential in the low MET region where other, traditional, analyses had little or no sensitivity.** This analysis has been approved and published in Phys. Rev. D in 2011, and has been showed in many high-profile conferences (Moriond 2011, SUSY2012, HCP2012).

Then, led, constructed and performed a **completely data-driven**, hence almost systematics free, **search for third generation SUSY.** This search targeted gluino induced stop production in events with two OS leptons in the final state, large number of jets and b-jets, and large missing transverse energy. The analysis has been approved and published in Phys. Lett. B, and has been presented in numerous high-profile conferences (DIS2014, ICHEP2014, and SUSY2014).

Standard Model Measurements (2010-present)

- **Higgs Physics (2017-present) :** Led and developed together with my group (Postdoctoral Research Dr. Eftychia Tzovara, PhD student Haris Painesis, Junior PhD student Polytimi Iosifidou, PhD student Charis-Kleio Koraka) and in collaboration with **Dr. G. Anagnostou and Dr. G. Daskalakis from the NCSR Demokritos Institute,** a **novel analysis for the measurement of the $t\bar{t}H$, $H \rightarrow b\bar{b}$ associated production in the dileptonic channel,** that allows us to study in detail the Higgs coupling with the heaviest known elementary particle. This analysis pioneered the reconstruction of the Higgs mass, as the final observable turning the search into a “bump” hunt over the smooth $t\bar{t}b\bar{b}$ background. For this, we introduced and utilized i) novel kinematical methods for the Higgs mass reconstruction and ii) **an entirely data-driven method for estimating the main $t\bar{t}b\bar{b}$ background.** The former identifies the Higgs particle using its mass, and the latter **significantly reduces the main systematic uncertainties of the measurement, making it in the longer term (HL-LHC) statistics from systematics limited.** Completed the full Run II analysis (CMS Thesis Endorsement on September of 2021 of former PhD student Charis Kleio Koraka). In parallel we have performed the analysis sensitivity projection for the upcoming Run III and HL-LHC, fully exploiting its potential being statistics and not systematics limited. **This analysis has been approved, made public and incorporated in the ATLAS-CMS White Paper for Snowmass [CMS-PAS-FTR-22-001].** Also, presented in a Poster at Snowmass in Seattle by formed PhD student Charis Kleio Koraka, yielding a prize.

In addition, our novel method for estimating the $t\bar{t}$ background from lower b -tagged jet multiplicities is incorporated **in the combination analysis using the full Run II dataset and all final states (full hadronic, single-lepton and dileptonic), now in the final publication phase [HIG-19-011] addressing referee comments.**

Now, **as core members** of the $t\bar{t}H$, $H \rightarrow b\bar{b}$ Run III analysis team, me and my group (Postdoctoral researcher Dr. Eftychia Tzovara, Junior PhD student Polytimi Iosifidou, PhD student Haris Painesis) **are working towards the Run III analysis** with a plan to implement and improve, where possible, the TRF data-driven $t\bar{t}$ background prediction, and the Higgs mass reconstruction. Doing so, **we are collaborating closely with the ETH group (Matteo Marchegiani, Davide Valsecchi, Mauro Donegà, Rainer Wallny) becoming familiar, and contributing to the development, of a novel and more efficient analysis framework using a columnar approach (Coffea).**

- **Jet cross section measurements (2010-2015):** As contact person and key analyzer, performed, **together with my former student Manolis Chaniotakis, QCD measurements of the inclusive jet and dijet cross-sections with 7 and 8 TeV data, published to peer reviewed journals. Lead, coordinated and supervised, being the co-convenor of the CMS Physics Analysis Group “Standard Model Physics with Jets” [2012 -2014], all CMS QCD related measurements with jets in the final state, yielding seven preliminary public results, and eight publications in referred journals, a significant outcome for this physics group.**

Physics Object Commissioning, Performance and Calibration (2009-present):

- **Jet Commissioning (2010-present):** Among the first who performed early detector commissioning studies analyzing the first collision data, studying in detail jet quantities and characteristics. This work yielded the first CMS public results (physics analysis summaries) with collision data in **2010** related with jet and missing transverse energy performance. Continuing **till now, together with my group (PhD student Ilias Zisopoulos, Junior PhD student Maria Kotsarini, Dr. E. Tziaferi), to perform detailed studies of PF jet characteristics in every new data-taking period, providing very useful and critical in times input to the experiment, and contributing to smooth and high quality data-taking. Constantly studying and promptly (if not first) reporting on the quality and characteristics of Run III 13.6 TeV datasets (see below some very early presentations given in the CMS JETMET and EXOTICA general meetings):**

https://indico.cern.ch/event/1185856/contributions/5000479/attachments/2493349/4281950/RunIII_Jets_16_08_2022.pdf

https://indico.cern.ch/event/1188430/contributions/4994429/attachments/2490488/4276900/RunIII_Jets_08_08_2022.pdf

Due to the **significant role of my group** in CMS Jet energy determination, Jet Identification, and Jet Performance, all members (PhD student Ilias Zisopoulos, Junior PhD student Maria Kotsarini and Dr. Eirini Tziaferi) have been **invited** by the **JETMET, JMAR and JERC conveners, at the 2023 Annual JETMET workshop, to present summary talks and closely collaborate with experts.**

- **Data Quality Monitoring (DQM) of Scouting Jets in Run III (2024-present):** As a continuation of the experience and expertise my group has on studies (see below on PF Scouting Jets of Run III and HL-LHC) and analysis (dijet resonance searches mentioned previously) with scouting jets, **my group is undertaking, led by my new Postdoctoral Researcher Dr. Eftychia Tzovara, the development of offline and online DQM for Scouting jets, in collaboration with the CMS JETMET and HLT-Scouting groups. Our goal is to provide the needed framework such that Scouting jets can be routinely and automatically monitored in terms of the performance and quality as all other jet collections. This is an important step towards the wider and easier utilization of scouting jets for novel new physics searches in Run III and beyond.**

- **Jet energy corrections and jet resolutions (2010-present)** : Led the work, being the co-convenor of the CMS Jet Algorithms group [2011-2013], related with the estimation of the jet energy resolution using data-driven techniques, and served as the editor of the first CMS publication describing the estimation of jet energy scale and jet resolution. This publication, summarizing the work of this group, is a milestone/reference CMS publication, having collected over 1000 citations to date. **Since 2018 responsible, together with my group (PhD student Ilias Zisopoulos, former PhD student Magda Diamantopoulou now Postdoctoral Researcher at Carleton, and Dr. E. Tziaferi), for the estimation, detailed studies and further optimization and improvement of baseline jet energy corrections (JECs), obtained from simulation, for all types of PF jets (AK4, AK8, PUPPI, CHS etc).** This responsibility includes presenting, documenting the results and providing collaboration – wide support.
- **Jet identification criteria for offline jets (2010-present)** : Pioneered, in 2010, and led the effort for the development, documentation, CMS software implementation and user support of the jet quality selection and identification criteria (JetID) used by all CMS analysis, enabling the first CMS mono-jet Dark Matter searches. **Since 2010 I am the contact person responsible for this CMS task together with my group.** During Run II further developed, tuned presented and documented jet quality criteria for every different data-taking period, (with Dr. E. Tziaferi, former PhD student Dimitrios Karasavvas, now Data Scientist, AI developer in the private sector, and graduate student Maria Kotsarini) extending them to novel jet physics objects, called PUPPI jets, which significantly suppress pile-up interactions. As such they are going to be the standard analysis objects in the forthcoming data-taking periods, namely in Run III that just started and HL-LHC. It is important to note that these criteria are utilized both offline and online as part of the High-Level Trigger. Related to this, have performed, **together with my group (Junior PhD student Maria Kotsarini, PhD student Ilias Zisopoulos, MSc student Amalia Triantou, Dr. E.Tziaferi) very detailed and comprehensive studies and comparisons of the performance and characteristics of PUPPI jets with CHS ones, utilizing the first Run III data,** examining both low level jet quantities and high analysis level event quantities. **These provided the basis for the CMS JETMET group to proceed with the wide utilization of PUPPI jets in Run III.**
- **Jet identification criteria for Scouting Jets (2024-present)** : Leveraging our large expertise on jets, their characteristics, and on developing JetID for offline PF jets, we (Postdoctoral researcher Dr. Eftychia Tzovara, MSc student Aikaterini Karmi, NS) recently undertook the responsibility to provide those for Scouting (HLT_I) jets as well. This is currently missing for Scouting jets and is a very high priority both for triggering and at the offline analyses level.
- **Data Commissioning in early LHC running (2010-2011)**: Member of the core group, which developed the code and the criteria needed in order to select and analyze data geared towards SUSY searches (member of the SUSYCAF team), yielding the first CMS internal document (analysis note) describing the analysis of the first collision data from a SUSY perspective, and serving as reference for subsequent SUSY analyses.

L1 Trigger (2018-present):

- **L1 EGAMMA Trigger performance (2018-present)**: The CMS Level-1 trigger uses information from the electromagnetic/hadronic calorimeters and muon detectors with coarse granularity and precision in order to select collision events. The selection is performed using a list of algorithms (seeds), which check whether events fulfil a set of predetermined criteria. Different algorithms can be adopted depending on the physics process or phase space that is targeted. The set of algorithms used, constitutes the L1 trigger menu. Any event that satisfies the conditions of at least one seed in the menu is accepted for further processing in the trigger chain. **Since 2018, and together with former PhD student Charis Kleio Koraka, and MSc student Haris Painesis, we are performing detailed studies of the performance of the L1 EGAMMA trigger for Run II and dedicated, detailed studies of a phenomenon in the ECAL generating large but fake energy deposits called ECAL spikes.** The studies include estimation of the trigger efficiencies using Tag-and-Probe methods in $Z \rightarrow e + e -$ events, inclusive and as a function of the number of reconstructed vertices using different isolation criteria, trigger rates, rates of ECAL spikes as a function of transverse energy (E_T) and pseudo-rapidity

(η). These are documented in the relevant CMS publication on the performance of the CMS Level-1 trigger during Run II. **Now my PhD students Haris Painesis and Polytimi Iosifidou are analyzing Run III data using EGamma and Zero-bias data-sets, and Haris is co-authoring the public detector performance note with Run III data. For his contributions he is presenting a Poster on the Trigger for HL-LHC in ICHEP2024**

CMS Upgrades (2013-present):

- **CMS High Granularity Calorimeter (HGCAL) for HL-LHC (2013-2016) :** Led the work for porting, further developing and utilizing the PandoraPFA particle flow algorithm, used over a decade by the entire ILC community and lately by neutrino experiments, in exploiting and studying the performance of a high granularity forward calorimeter (HGCAL) for the CMS Phase II upgrades. Together with a very small group of people initially, in close collaboration with former Demokritos Institute Postdoc Dr. Andreas Psallidas (then a postdoc at University of Taiwan working on HGCAL, and now Researcher C in NCSR Demokritos, Greece) and the PandoraPFA authors, made the PandoraPFA package fully operational, utilized it, developed all needed analysis tools and conducted jet, photon and electron related performance studies with HGCAL. **These studies were documented and presented to the CMS collaboration and were critical for its decisions in 2014 and 2015 as to which of the initially three (2014) and then two (2015) proposed detectors for the High Luminosity LHC (HL-LHC) upgrades would go forward.** The HGCAL proposal was chosen in April of 2015 by the CMS collaboration as the forward calorimeter upgrade option for the HL-LHC running period.
- **Jet Particle Flow Scouting for Run III and HL-LHC (2020-present) :** Together with my former PhD student, Dr. Dimitrios Karasavvas, joined the effort for implementing and expanding the novel “CMS PF scouting” method for Run III with the use of GPU computing. **The goal of this work is to fully utilize the scouting discovery potential in Run III and HL-LHC, lowering PF jet trigger thresholds allowed by the significant gains in timing with the use of GPUs and the formation of PF jets with tracks from the pixel detector only (“Patatrack pixel tracks”).** We have conducted numerous, detailed and novel jet performance studies that clearly demonstrated their very good physics performance for both resolved and boosted jet topologies. This work was critical on the decision to utilize these physics objects in Run III and HL-LHC, that will allow us to probe unexplored regions of parameter space at lower particle masses and weaker couplings and hence significantly enhance the physics discovery potential. The results have been presented in CMS Collaboration wide meetings and are already made public and documented in a CMS detector performance note.

DETAILED RESEARCH ACTIVITIES IN NEUTRINO PHYSICS |(1994-2010):

The neutrino has been one of the most elusive, enigmatic and fascinating particles of the last 80 years, since Pauli proposed its existence “in desperation”, as he wrote in this letter to the community in the 1930;s. The existence of the neutrino, the non-zero non-degenerate neutrino masses yielding neutrino oscillations, verified and measured with great precision with atmospheric, solar, reactor, accelerator neutrinos, and in the past four years the measurement of a relatively large third mixing angle, came as great surprises to the high-energy physics community. The smallness and origin of the neutrino mass, the question of CP violation (CPV) in the neutrino sector, the hierarchy of the neutrino masses, and the neutrino nature itself as a Dirac or Majorana particle are all major open questions in the field of neutrino physics. My research in the area of neutrino physics is described below.

- ***USA long-baseline neutrino experiment study (2007-2009):*** Played a key and leading role in this group: I developed fast simulations and elaborate fitting tools for the evaluation of the discovery potentials of future neutrino oscillation experiments, studying and examining several detector options, beam configurations, and baselines. These studies were crucial in determining the proposed staged accelerator neutrino program in the US (and worldwide) for the following decades. As such, they were presented, and used by the Fermilab Directorate, the Fermilab PAC (physics advisory

committee) and the US DOE/NSF Advisory Panels HEPAP (High Energy Physics Advisory Panel), and P5 (Particle Physics Project Prioritization Panel) with me serving as one of the key contacts. This work resulted in the strategic decision of proposing the DUSEL (then), DUNE (now) long baseline, deep underground neutrino facility. After many years and excellent work from the neutrino physics community, DUNE is now gaining tremendous momentum, and is becoming the biggest international deep underground neutrino experiment that could dominate advancements of our knowledge in this field for the next decades.

- ***NOvA (NuMI Off-Axis Nue Appearance) experiment (2006-2009):*** Played a leading role in a variety of optimization studies before the construction phase of the experiment: for the near-detector electronics in order to be able to resolve single neutrino interactions (multiple neutrino events are present in the Near Detector, for the determination of the optimal near detector position in order to achieve maximum cancellation of the near-to-far detector extrapolation uncertainties. Also, pioneered the use of artificial neural network techniques to maximize the discovery potential of the experiment, which have been used to obtain the discovery potentials for θ_{13} and the neutrino mass hierarchy, documented in the Technical Design Report. Due to my above contributions to the experiment I was included in the first publications in 2016 with real data, both for the muon neutrino oscillations into tau neutrinos (main oscillation channel) and for those into electron neutrinos which were very recently discovered (2012) from experiments close to nuclear reactors.
- ***MINOS (Main Injector Neutrino Oscillation Search) experiment (2003-2010):*** Played a crucial and leading role in the installation, the commissioning, and monitoring of the near detector and the data collection, quality control, and data analysis of both the far and the near detectors of the experiment. I worked on the characterization of the Multi Anode Photomultipliers used in the MINOS Far Detector, on the calibration and online monitoring of the near detector QIE electronics, as well as on the near detector installation and commissioning phase. Developed event separation techniques using graph theory, and event classification techniques using artificial neural networks. Led, constructed and deployed a robust and pioneering near-to-far extrapolation technique, cancelling the main neutrino beam and cross-section systematic uncertainties and fully utilizing the “two-detector” MINOS designs. With this I performed, from start to end, the first oscillation analysis of the MINOS experiment. This method is used for the MINOS main oscillation analyses till now. As the co-convenor of the Neutral Current Physics Group led the effort for the sterile neutrino measurement. As the co-convenor of the Future Running Scenarios Physics Group, led the effort for exploring and evaluating future MINOS running scenarios, based on physics impact and discovery potentials of all possible oscillation measurements. The Fermilab Directorate, and the Physics Advisory Committee (PAC) used the recommendations of this study in order to determine the future running configurations of MINOS.

DONUT (Direct Observation of the NUTau) experiment (1994-2003):

- Worked on nearly all aspects of the experiment: From the installation of the detector and running the experiment, to the calibration of the electromagnetic calorimeter, and the final data analysis of neutrino interactions. I developed clustering methods for pattern recognition and event reconstruction, using graph - theory and minimization techniques. I developed artificial neural network techniques for neutrino event selection, neutrino event characterization, and background estimation, used for the first observation of the tau neutrino.

CONFERENCE ORGANIZING COMMITTEES (12)

- Co-chair and co-organizer of the Electroweak Physics and Beyond the Standard Model Searches Sessions at **DIS2023**, 27th March – 1st April 2023, Michigan State University, East Lansing, Michigan, USA.
- Co-chair and co-organizer of the Beyond the Standard Model Sessions at **ICHEP 2022**, Bologna, Italy, 7 – 13th July 2022.
- Co-chair and co-organizer of the Beyond the Standard Model Sessions at **LHCP 2021**, Paris, France, 7 – 12th June 2021.
- Co chair and co-organizer of the “New results from LHC, New facilities” sessions at **DISCRETE 2018**,

Vienna, Austria, 26-30 **November 2018**

- Co-chair and co-organizer of the Exotica Parallel Sessions at **LHCP 2018**, Bologna, Italy, 4 - 9 **June 2018**,
- Co-convenor and co-organizer of the QCD sessions in the **SM@LHC 2015** Conference, 21-24 **April 2015**, Galileo Galilei Institute, Florence, Italy.
- Local Organizing Committee of **HEP 2015**: Conference on Recent Developments in High Energy Physics and Cosmology, 14-17 **April 2015**, Hellenic Society for the Study of High Energy Physics, Athens, Greece.
- Local Organizing Committee of **HSSHEP 2014**: Conference on Recent Developments in High Energy Physics and Cosmology, 8-10 **May 2014**, Hellenic Society for the Study of High Energy Physics (**HSSHEP**), Chora, Island of Naxos (Greece).
- QCD session chair at **Blois Conference**, May 29-**June 3, 2011**, Blois France.
- Organizing Committee of the XXIV International Conference on Neutrino Physics and Astrophysics (**NEUTRINO2010**), **June 2010**
- Scientific Organizing Committee of the 11th International Workshop on Neutrino Factories, Super Beams and Beta Beams (**NUFACT2009**)
- Local Organizing Committee of the 2008 Neutrino Physics Summer School (**NUSS2009**)

TALKS AT CONFERENCES (24)

- 24) “Search for new resonances”, (**Invited talk**), ICFA2023: 13th ICFA Seminar on Future Perspectives in High-Energy Physics, 28 Nov-1 Dec **2023**, DESY, Hamburg (Germany), From the conference website: *“Every three years, the International Committee for Future Accelerators (ICFA) organises a seminar on “Future Perspectives in High Energy Physics”. This is a four-day international exchange of information concentrating on plans for future facilities in the field of particle physics. The meeting is by invitation only and comprises the directors of most of the world’s major laboratories in our field, senior particle and accelerator physicists, and government science officials from several countries.”*
- 23) “Summary of EW and BSM Sessions”, Wouter Deconinck, Niki Saoulidou, Doreen Wackerroth, (**Invited talk**) DIS2023, Michigan, USA, March 2023
- 22) “Search for low and high mass mediators in ATLAS and CMS”, (**CMS Selected talk**), **On behalf of the ATLAS and CMS Collaborations**, LHCP2022, 16-21 May 2022, Taiwan, (**Major international conference**)
- 21) “Recent EXOTIC results from ATLAS and CMS”, (**Invited talk**), **On behalf of the ATLAS and CMS Collaborations**, Aspen Winter Conference on Particle Physics: New methods and ideas at the frontiers of particle physics, 20-25 Mar 2022, Aspen, CO (United States) (**Cancel due to COVID**)
- 20) “Hunting for Dark Matter with the ATLAS and CMS Experiments”, (**Invited talk**), On behalf of the ATLAS and CMS Collaborations MOCa workshop (Materia Oscura en Colombia) 8-11 June 2021
- 19) “QCD impact in BSM searches at LHC”, (**Invited talk**), QCD@LHC Workshop, 31 Aug-4 Sep 2020, Video only
- 18) “Standard Model measurements with photons”, (**Invited talk**), PHOTON 2019, International Conference on the Structure and the Interactions of the Photon, 3-7 June 2019, Frascati, Italy
- 17) “BSM searches with jets in CMS”, (**CMS Selected talk**), DISCRETE 2018, 26-30 November 2018, Vienna, Austria
- 16) “Searches for new heavy resonances in final states with dileptons, diphotons and dijets in CMS”, (**CMS Selected talk**), 29th Rencontres de Blois, Particle Physics and Cosmology, May 28 - June 02, 2017, Blois, France
- 15) “QCD with jets and photons at ATLAS and CMS”, (**CMS Selected talk**), 28th Rencontres de Blois, Particle Physics and Cosmology, May 29 - June 03, 2016, Blois, France
- 14) “Recent results from CMS”, (**CMS Selected talk**), PLANCK2015: 18th International Conference from the Planck Scale to the Electroweak Scale, 25-29 May 2015, Ioannina, Greece
- 13) “Summary of the QCD results” (N. Saoulidou, V. Coco, A. Banfi), (**Invited talk**) SM@LHC 2015 Conference, 21-24 April 2015, Galileo Galilei Institute, Florence, Italy.
- 12) “Inclusive SUSY searches at CMS” (**CMS Selected talk**) DIS 2014: XXII International Workshop on Deep-Inelastic Scattering and Related Subjects, 28 Apr-2 May 2014, Warsaw (Poland) (**Major international conference**).
- 11) “Searches for third generation SUSY from CMS”, (**CMS selected talk**) "ICNFP2013: 2nd International Conference on New Frontiers in Physics, 27 Aug-7 Sep 2013, Orthodox Academy of Crete, Kolymbari (Greece)
- 10) “QCD results at LHC”, (**CMS and ATLAS Selected talk**), Rencontres de Moriond, EW interactions and

- Unified Theories, March 2nd - 9th, 2013, La Thuile, Aosta Valley, Italy. (**Major international conference**)
- 9)“SUSY Searched at CMS”, (**CMS Selected talk**), ICFP2012: First International Conference on New Frontiers in Physics, 10-16 Jun 2012, Kolybari (Greece).
- 8)“QCD results with jets and photons from the CMS experiment”, (**CMS Selected talk**) 23rd Rencontres de Blois Particle Physics and Cosmology, 26th May – 3 June 2011, Blois, France (**Major international conference**)
- 7)“Neutrino Physics Experiments”, **Invited Talk** at DISCRETE '08, 11 - 16 December 2008, IFIC, Valencia, Spain
- 6) “Status and prospects for long baseline neutrino experiment”, **Invited Talk** at Nufact08, 30th June - 5th July 2008, Valencia, Spain (**Major international conference**)
- 5)“Future possibilities with neutrino beams from Fermilab”, **Invited Talk** at Neutrino 2008 (the XXIII International Conference on Neutrino Physics and Astrophysics) 25-31 May 2008, Christchurch, New Zealand (**Major international conference**)
- 4)“Recent Development in Experimental Neutrino Physics”, **Invited Talk** at ASPEN Winter Conference "Revealing the Nature of Electroweak Symmetry Breaking", 13-19 January 2008, ASPEN Colorado USA. (**Major international conference**)
- 3)“MINOS Experiment: Status and First Results from the NUMI Beam", **Invited Talk** at Les Rencontres de Physique de la Vallée D'Aoste, 4th March 2007, Italy (**Major international conference**)
- 2)“Status of the MINOS Experiment”, **Invited Talk** at ASPEN Winter Conference "Particle Physics at the Verge of Discovery", 12-18 February 2006 ASPEN Colorado, USA (**Major international conference**)
- 1)“DONUT: Neutrino Analysis Techniques”, **Invited Talk** at Les Houches Euro-conference on Neutrino Masses and Mixings 18-22 June 2001, Les Houches, France (**Major international conference**)

COLLOQUIA, SEMINARS, SCHOOLS (16)

- 16) “Hunting for new physics at CERN: Highlights and Prospects”, **Colloquium** at the University of Wisconsin Madison, Madison, USA, April 20th, 2023
- 15) “Hunting for jets resonances at CMS: Highlights and Prospects”, **Fermilab Wine and Cheese Seminar**, Fermilab, Chicago, USA, 21st April 2023
- 14)“Recent results from narrow and broad, low and high mass dijet resonance hunting with the CMS Experiment”, **CERN-LHC Wide Seminar**, Tuesday 23 July 2019, Council Chamber (503-1-001) , 11h00
- 13)“Beyond T2K and NOvA: Superbeams and very large detectors”, International **Neutrino Summer School**, Fermi National Accelerator Laboratory, Batavia, Illinois USA, 15th July 2009
- 12)“Neutrino Physics and Experiments”, **Fermilab Summer Lectures**, Fermi National Accelerator Laboratory, Batavia, Illinois USA, 05th August 2008
- 11) “Accelerator-based Long Baseline Neutrino Experiments”, **Colloquium** at Caltech University, USA, 20th November 2008
- 10)“Neutrino Physics at Fermilab”, Fermilab **Colloquium**, Fermi National Accelerator Laboratory, Batavia, Illinois, USA, 9 April 2008
- 9) “MINOS Experiment: Oscillation results from the first two years of running", **Colloquium** at Northwestern University, USA, 30th November 2007
- 8) “MINOS Oscillation results from the first two years of running and Future accelerator neutrino oscillation experiments", **Seminar** at the University of Chicago, USA, 8th October 2007
- 7) “Sensitivities and Contours: Tutorial I”, at the "**Neutrino Physics Summer School** at Fermilab", Fermi National Accelerator Laboratory, Batavia, Illinois, USA, July 2-13, 2007
- 6)“Neutrino Physics and Experiments”, **Fermilab Summer Lectures**, Fermi National Accelerator Laboratory, Batavia, Illinois USA, 17th July 2007
- 5) “MINOS Experiment: Oscillation results from the first two years of running", **Fermilab Special Wine and Cheese Seminar**, Fermi National Accelerator Laboratory, Batavia, Illinois USA, 19th July 2007
- 4) “MINOS Experiment: Status and First Results from the NUMI Beam”, **Colloquium** at Yale University, USA, October 13th, 2006
- 3)“MINOS Experiment: Status and First Results from the NUMI Beam”, **Seminar** at the University of Maryland, USA, November 15th, 2006
- 2)“Neutrinos: Past, Present and Future or The Neutrino Odyssey”, **Fermilab World Year of Physics Symposium, 8 October 2005**, Fermi National Accelerator Laboratory, Batavia, Illinois, USA
- 1)“Analysis Techniques and Status of the DONUT Experiment”, Argonne HEP **Seminar**, 24 February 2004, Argonne National Laboratory, USA

TALKS AT NATIONAL AND INTERNATIONAL WORKSHOPS (28)

- 28) “Introduction of Deep Dive on QCD backgrounds at CMS”, Niki Saoulidou, Chris Palmer and Melissa Quinnan, CMS Deep Dive on QCD backgrounds, Tuesday 30th May June 2023, CERN, Geneva Switzerland
- 27) “Current status and planning for Run 3”, Niki Saoulidou, Steven Lowette, CMS Exotica Workshop 2020, 27-30 October 2020, Virtual
- 26) “Status & Plans for EXO now and towards Run III”, Niki Saoulidou, Adish Vartak, CMS Exotica Workshop 2019, 31 October 2019 to 2 November 2019, RWTH Aachen Campus Melaten Physikzentrum
- 25) “Workshop Summary and Wrap-Up”, Niki Saoulidou, CMS Exotica Workshop 2018, 1 November 2018 to 3 November 2018, Prytaneia, National and Kapodistrian University of Athens, Greece
- 24) “Dijet Resonance Searches in CMS”, N. Saoulidou, Recent Developments in High Energy Physics and Cosmology 28 March-1 April 2018, National Technical University of Athens, Greece.
- 23) “Recent Exotic results with Jets+X from CMS”, N. Saoulidou, Recent Developments in High Energy Physics and Cosmology 12-15 May 2016, University of Thessaloniki, Greece.
- 22) “Particle Flow Jet Identification criteria with CMS at 13 TeV”, M. Diamantopoulou, N. Saoulidou and E. Tziaferi, Recent Developments in High Energy Physics and Cosmology 12-15 May 2016, University of Thessaloniki, Greece.
- 21) “An alternative approach for the Standard Model Background estimation in the Dijet Resonance Search with CMS at 13 TeV”, D. Karasavvas, N. Saoulidou and E. Tziaferi, Recent Developments in High Energy Physics and Cosmology 12-15 May 2016, University of Thessaloniki, Greece.
- 20) “High Granularity Calorimetry and Particle Flow for the CMS Phase 2 Upgrade”, Andreas Psallidas, N. Saoulidou, Recent Developments in High Energy Physics and Cosmology 14-18 April 2015, University of Athens, Greece.
- 19) “Dijet resonance searches at CMS”, (N. Saoulidou, E. Tziaferi), Recent Developments in High Energy Physics and Cosmology 14-18 April 2015, University of Athens, Greece.
- 18) “Third generation SUSY searches at CMS”, Recent Developments in High Energy Physics and Cosmology 8-10 May 2014, Chora-Naxos, Greece.
- 17) “Recent QCD results from CMS”, Recent Developments in High Energy Physics and Cosmology 25-28 April 2013, Univ. of the Aegean, Chios, Greece.
- 16) “Searches for SUSY in events with two opposite-site leptons and missing transverse energy with the CMS detector”, Recent Developments in High Energy Physics and Cosmology 25-28 April 2013, Univ. of the Aegean, Chios, Greece.
- 15) “Jet results from ATLAS and CMS”, Working Group on Electroweak precision measurements at the LHC, 15-16 April 2013, CERN, Geneva Switzerland.
- 14) “Exciting Research at Fermilab”, Niki Saoulidou, Rob Roser, Michael Crisler, American Association for the Advancement of Science (AAAS), American Association of Physics Teacher (AAPT), Winter Meeting February 12-16, 2009 Chicago, Illinois (Talk given by D. Schmitz on my behalf)
- 13) “MINOS oscillation results from the first two years of running and future neutrino oscillation experiments” at the XXVI Workshop on Recent Developments in High Energy Physics and Cosmology, Ancient Olympia, 16-19 April 2008.
- 12) “Dual Readout Calorimeter for the ILC Detector”, Joint Meeting of the American Linear Collider Physics Group, Fermi National Accelerator Laboratory, Batavia, Illinois, USA, 22-26 October 2007
- 11) “Characterization of Silicon Photo-detectors”, G. Mavromanolakis, A. Para, N. Saoulidou, Novel Photo Detectors Workshop 2007, Kobe Japan
- 10) “Planar Dual Readout Calorimetry Studies and Progress Report”, G. Mavromanolakis, A. Para, N. Saoulidou, H. Wenzel, Shin-Shan Yu, Tianchi Zhao, 2007 International Linear Collider Workshop, DESY, Hamburg, Germany, May 30 - June 3 2007
- 9) “USA Neutrino Long Baseline Study”, International Design Study for the Neutrino Factory CERN, 29th March 2007
- 8) “The Beam Matrix Method to perform the Near-Far Extrapolation in MINOS”, Joint Meeting of Pacific Region Particle Physics Communities October 29th-November 3rd, 2006
- 7) “Status of the MINOS Experiment”, Fermilab Users Meeting 2005, 8-9 June 2005, Fermi National Accelerator Laboratory, Batavia Illinois, USA
- 6) “Analysis Techniques and Status of the DONUT experiment”, American Physical Society April Meeting 2004, 1-4 May 2004, Denver Colorado, USA

- 5)“Status of the MINOS Experiment”, American Physical Society April Meeting 2004, 1-4 May 2004, Denver Colorado, USA
- 4)“DONUT: Status and Analysis”, Current Developments in High Energy Physics, The Annual Meeting of the Hellenic Society for the study of High Energy Physics HEP 2002 25-27 April, Univ. Of Patras, Greece
- 3)“Neutrino Analysis Techniques for the DONUT Experiment”, Current Developments in High Energy Physics, The Annual Meeting of the Hellenic Society for the study of High Energy Physics HEP 2001 6-8 April Univ. Of Heraklion, Crete, Greece
- 2)“DONUT: EMCAL and Analysis Status”, Current Developments in High Energy Physics, The Annual Workshop of the Hellenic Society for the study of High Energy Physics. HEP 2000 20-23 April, Univ. Of Ioannina, Greece

PUBLICATION SUMMARY: Generated on 2023-10-05

	Citeable	Published
Papers	1,184	1,157
Citations	152,701	149,596
h-index	184	181
Citations/paper (avg)	129	129.3

PUBLICATIONS IN REFEREED JOURNALS WITH SIGNIFICANT/MAJOR PERSONAL INVOLVEMENT AND CONTRIBUTIONS (37)

- 37) Measurement of the $t\bar{t}H$ and tH production rates in the $H \rightarrow b\bar{b}$ decay channel using proton-proton collision data at $\sqrt{s} = 13$ TeV, CMS Collaboration, e-Print: 2407.10896 [hep-ex], **Submitted to JHEP**
- 36) Search for resonant and non-resonant production of pairs of identical dijet resonances in pp collisions at $\sqrt{s} = 13$ TeV, CMS Collaboration, **JHEP 07 (2023) 161, 33 citations**
- 35) Probing generalized neutrino interactions with DUNE Near Detector, Pantelis Melas (NKUA), Dimitrios K. Papoulias (NKUA), Niki Saoulidou (NKUA), **JHEP 07 (2023) 190, 10 citations**
- 34) Snowmass White Paper Physics with the Phase-2 ATLAS and CMS Detectors, The ATLAS and CMS Collaborations, **ATL-PHYS-PUB-2022-018, CMS-PAS-FTR-22-001, <https://inspirehep.net/literature/2071542> CERN-CDS: <http://cds.cern.ch/record/2806962>, 28 citations.**
- 33) Pileup mitigation at CMS in 13 TeV data, CMS Collaboration, **JINST 15 (2020) 09, P09018, 326 citations.**
- 32) Search for narrow resonances in the b-tagged dijet mass spectrum in proton-proton collisions at $\sqrt{s} = 13$ TeV, CMS Collaboration **Phys.Rev.D 108 (2023) 1, 012009, 22 citations**
- 31) Search for high mass dijet resonances with a new background prediction method in proton-proton collisions at $\sqrt{s} = 13$ TeV, CMS Collaboration, **JHEP 05 (2020) 033, 204 citations**
- 30) Performance of the CMS Level-1 trigger in proton-proton collisions at $\sqrt{s} = 13$ TeV, CMS Collaboration, **JINST 15 (2020) 10, P10017, 296 citations**
- 29) Search for narrow and broad dijet resonances in proton-proton collisions at $\sqrt{s} = 13$ TeV and constraints on dark matter mediators and other new particles, CMS Collaboration, **JHEP 1808 (2018) 130, 244 citations.**
- 28) Search for dijet resonances in proton-proton collisions at $\sqrt{s} = 13$ TeV and constraints on dark matter and other models, CMS Collaboration, **Phys.Lett. B769 (2017) 520-542, 213 citations.**
- 27) HGCAL: A high Granularity Calorimeter for the endcaps of CMS at HL-LHC, CMS Collaboration (A.M. Magnan (Imperial Coll., London) for the collaboration). 2017, **JINST 12 (2017) no.01, C01042, 22 citations.**
- 26) Search for narrow resonances decaying to dijets in proton-proton collisions at $\sqrt{s} = 13$ TeV

CMS Collaboration,

Phys.Rev.Lett. 116 (2016) no.7, 071801, 217 citations

25) Searches for supersymmetry based on events with b jets and four W bosons in pp collisions at 8 TeV
CMS Collaboration,

Phys.Lett. B745 (2015) 5-28, 41 citations

24) Search for supersymmetry in events with opposite-sign dileptons and missing transverse energy using an artificial neural network, CMS

Phys. Rev. D 87 (2013) 072001, 23 citations.

23) Measurements of differential jet cross sections in proton-proton collisions at $\sqrt{s}=7$ TeV with the CMS detector CMS Collaboration,

Phys.Rev. D87 (2013) 11, 119902, 239 citations

22) Determination of Jet Energy Calibration and Transverse Momentum Resolution in CMS, CMS Collaboration

JINST 6 (2011) P11002, 1325 citations

21) Measurement of the Inclusive Jet Cross Section in pp Collisions at $\sqrt{s}=7$ TeV, CMS Collaboration,

Phys.Rev.Lett. 107 (2011) 132001, 200 citations

20) Measurement of the differential dijet production cross-section in proton-proton collisions at $\sqrt{s}=7$ TeV
CMS Collaboration

Phys.Lett. B700 (2011) 187-206, 98 citations

19) Fermilab's intensity frontier, Andre de Gouvea (Northwestern U.), Niki Saoulidou (Fermilab). 2010. 26 pp.

Ann.Rev.Nucl.Part.Sci. 60 (2010) 513-538, 22 citations

18) Search for sterile neutrino mixing in the MINOS long baseline experiment, MINOS Collaboration,

Phys.Rev. D81 (2010) 052004, 122 citations

17) Neutrino and Antineutrino Inclusive Charged-current Cross-Section Measurements with the MINOS Near Detector MINOS Collaboration,

Phys.Rev. D81 (2010) 072002, 181 citations

16) Search for muon neutrino to electron-neutrino transitions in MINOS, MINOS Collaboration

Phys.Rev.Lett. 103 (2009) 261802, 89 citations

15) Search for active neutrino disappearance using neutral-current interactions in the MINOS long-baseline experiment, MINOS Collaboration,

Phys.Rev.Lett. 101 (2008) 221804, 88 citations

14) Measurement of Neutrino Oscillations with the MINOS Detectors in the NuMI Beam, MINOS Collaboration,

Phys.Rev.Lett. 101 (2008) 131802, 545 citations

13) The Magnetized steel and scintillator calorimeters of the MINOS experiment MINOS Collaboration (D.G. Michael (Caltech) et al.). May 2008. 87 pp.

Nucl.Instrum.Meth. A596 (2008) 190-228, 407 citations

12) Combining CPT-conjugate neutrino channels at Fermilab Andreas Jansson (Fermilab), Olga Mena (INFN, Rome & Rome U.), Stephen J. Parke, Niki Saoulidou (Fermilab). Nov 2007. 21 pp.

Phys.Rev. D78 (2008) 053002, 34 citations

11) A Study of Muon Neutrino Disappearance Using the Fermilab Main Injector Neutrino Beam

MINOS Collaboration,

Phys.Rev. D77 (2008) 072002, 292 citations

10) Momentum measurement of secondary particle by multiple Coulomb scattering with emulsion cloud chamber in DONuT Experiment K. Kodama (Aichi U. of Education), N. Saoulidou, G. Tzanakos (Athens U.), B. Baller, B. Lundberg, R. Rameika (Fermilab), J.S. Song, C.S. Yoon, S.H. Chung (Gyeongsang Natl. U.)

Nucl.Instrum.Meth. A574 (2007) 192-198, 23 citations

9) Measurement of neutrino velocity with the MINOS detectors and NuMI neutrino beam

MINOS Collaboration,

Phys.Rev. D76 (2007) 072005, 187 citations

8) Observation of muon neutrino disappearance with the MINOS detectors and the NuMI neutrino beam MINOS Collaboration (D.G. Michael (Caltech) et al.). Jul 2006. 6 pp.

Phys.Rev.Lett. 97 (2006) 191801, 888 citations

7) First observations of separated atmospheric $\nu(\mu)$ and anti- $\nu(\mu)$ events in the MINOS detector, MINOS Collaboration,

Phys.Rev. D73 (2006) 072002, 120 citations

- 6) Characterization of 1600 Hamamatsu 16-anode photomultipliers for the MINOS Far detector
K. Lang, J. Day, S. Eilerts, S. Fuqua, A. Guillen, M. Kordosky, M. Lang, J. Liu, W. Opaska, M. Proga (Texas U.) et al. 2005. 20 pp.
Nucl.Instrum.Meth. A545 (2005) 852-871, 35 citations
- 5) Identification of neutrino interactions using the DONUT spectrometer
K. Kodama, C. Andreopoulos, N. Giokaris, N. Saoulidou, G. Tzanakos, B. Baller, D. Boehnlein, B. Lundberg, R. Rameika, J.S. Song et al. 2004. 13 pp.
Nucl.Instrum.Meth. A516 (2004) 21-33, 13 citations
- 4) The MINOS scintillator calorimeter system MINOS Collaboration,
IEEE Trans.Nucl.Sci. 49 (2002) 861-863, 22 citations
- 3) Detection and analysis of tau neutrino interactions in DONUT emulsion target
K. Kodama, M. Nakamura (Aichi U. of Education), N. Saoulidou, G. Tzanakos (Athens U.), B. Baller, B. Lundberg, R. Rameika (Fermilab), J.S. Song, C.S. Yoon, S.H. Chung (Gyeong University)
Nucl. Instrum. Meth. A493 (2002) 45-66, 113 citations
- 2) A New upper limit for the tau - neutrino magnetic moment DONUT Collaboration (R. Schwienhorst (Minnesota U.) et al.)
Phys.Lett. B513 (2001) 23-29, 85 citations
- 1) Observation of tau neutrino interactions DONUT Collaboration (K. Kodama (Aichi U. of Education) et al.). Dec 2000. 12 pp.
Phys.Lett. B504 (2001) 218-224, 1471 citations

PUBLICATIONS (NOT IN REFEREED JOURNALS) WITH SIGNIFICANT PERSONAL INVOLVEMENT AND CONTRIBUTION (13)

- 13) New Physics Opportunities at the DUNE Near Detector
Pantelis Melas (Athens U.), Dimitrios K. Papoulias (Athens U.), Niki Saoulidou (Athens U.)
DOI: 10.3390/particles7030035, Published in: Particles 7 (2024) 3, 623-633
- 12) Up-scattering production of a sterile fermion at DUNE: complementarity with spallation source and direct detection experiments,
Pablo M. Candela (Valencia U., IFIC), Valentina De Romeri (Valencia U., IFIC), Pantelis Melas (Athens U.), Dimitrios K. Papoulias (Athens U.), Niki Saoulidou (Athens U.), e-Print: 2404.12476 [hep-ph], 2024
- 11) QCD results at LHC, Niki Saoulidou (Univ. of Athens, Greece). Proceedings for Moriond EW 2013.
- 10) Neutrino experiments, Niki Saoulidou (Fermilab). 2009. 16 pp, Published in J.Phys.Conf.Ser. 171 (2009) 012015
- 9) Fermilab Golden Book http://www.fnal.gov/directorate/Longrange/Steering_Public/P5/Golden_Book-2008-02-03.pdf, FERMILAB-FN-0904, Cited by 3 records
- 8) Fermilab Steering Group Report "http://www.fnal.gov/pub/directorate/steering/index.html (2008)
FERMILAB-PUB-07-672-DI, Cited by 7 records
- 7) Status and Prospects of Long Baseline Neutrino Oscillation Experiments, Niki Saoulidou (Fermilab). Jun 2008. 9 pp., Published in PoS NFACT08 (2008) 003, Cited by 1 records
- 6) Letter of Intent: LAr5-A Liquid Argon Neutrino Detector for Long Baseline Neutrino Physics
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