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September 22, 2021

ACADEMIC APPOINTMENTS

- 12/2018 present, Chair of Experimental Particle Physics Department of Physics, University of Liverpool
- 06/2014 12/2018, Reader (Associate Professor) Department of Physics, University of Liverpool
- 02/2007 present, Staff Scientist

Particle Physics Department, Rutherford Appleton Laboratory, Science & Technology Facilities Council

- 06/2003 01/2007, Post-Doctoral Research Associate
 Particle Physics Department, Rutherford Appleton Laboratory, Science & Technology Facilities Council
- 09/1996 06/2003, Graduate Research Assistant Physics Department, University of Athens

EDUCATION

- 03/1999 06/2003, **PhD** (Physics)
 National and Kapodistrian University of Athens
 Thesis: 'Experimental Study of the Phenomenon of Neutrino Oscillations with the MINOS Experiment',
 UA/PHYS/HEP/02-06-2003; FERMILAB-THESIS-2003-39 (in Greek). Advisor: Prof. George Tzanakos
- 09/1996 11/1998, **MSc** (Nuclear and Particle Physics) National and Kapodistrian University of Athens Thesis: 'Calibration of a Prototype Electromagnetic Calorimeter for the COSMOS $\nu_{\mu} \leftrightarrow \nu_{\tau}$ Neutrino Oscillation Experiment', UA/PHYS/HEP/13-11-1998 (in Greek). Advisor: Prof. George Tzanakos
- 09/1992 09/1996, **BSc** (Physics) National and Kapodistrian University of Athens

LEADERSHIP

- 2021-present, Liverpool SBN and SBND PI.
- 2020-present, Member of the SBND Executive Committee.
- 2018-present, SBN Systematics and Oscillation Sensitivities WG Co-Coordinator.
- 2017-present, SBND Physics and Analysis Tool Co-Coordinator.
- 2015-2017, DUNE Near Detector Evaluation WG Coordinator.
- 2014-2019, DUNE-UK WP.1 (Physics Simulation and Experiment Design) Co-Coordinator.
- 2014-2015, Member of the T2K Analysis Steering Group.
- 2010-present, Coordinator of the VALOR Fitting Group.
- 2014-present, co-Spokesperson of the GENIE Collaboration.
- 2014-present, Member of the GENIE Executive Board.
- 2014-present, GENIE Tuning and Systematics WG Coordinator.
- 2006-2010, MINOS Physics Simulation WG Co-Coordinator.

PROFESSIONAL SERVICE

Project

• 2013 - 2021, Budget holder for T2K-UK STFC project.

Departmental

- 2019 present, Particle Physics Seminar Series co-Organizer, Physics Dept., University of Liverpool
- 2018 present, Equality and Diversity Deputy Director, Physics Dept., University of Liverpool
- 2014 2017, Member of the Departmental Research Excellence Framework (REF) Coordination Committee, Physics Dept., University of Liverpool

PhD examinations

- 2021, Internal PhD examiner for Alex Byrnes, University of Liverpool
- 2019, External PhD examiner for Colton Hill, University of Manchester
- 2019, Internal PhD examiner for James Hunt, University of Liverpool
- 2016, Examination panel member for first-year PhD students, University of Liverpool
- 2015, Internal PhD examiner for Thomas Stainer, University of Liverpool

Reviewing and editorial roles

- Referee for Europhysics Letters, European Physical Journal Plus, Advances in High Energy Physics, Nuclear Instruments & Methods in Physics Research A, Particle Data Group.
- 2018, Proposal Reviewer, Research Foundation Flanders, Belgium
- 2014 present, Proposal Reviewer, National Science Center, Poland
- 2020 present, Reviewer, STFC Ernest Rutherford Fellowship

Conference and school organization

- \bullet 2016, Member of the Scientific Organizing Committee, PHYSTAT- ν workshop, Fermilab, September 19-21.
- 2016, Chair, International Workshop on Global Fits to Neutrino Scattering Data and Generator Tuning (NuTune2016), Liverpool, July 11-15.
- 2015, Member of the Organizing Committee, NuSTEC Training in Neutrino Nucleus Scattering Physics, Okayama University, November 8-14.

- 2014, Member of the Organizing Committee, NuSTEC Training in Neutrino Nucleus Scattering Physics, Fermilab, October 16-27.
- 2014, Member of the Scientific Programme Committee, NuINT14 workshop, London, May 19-24 (co-Organized 'Neutrino Interaction Systematics for Oscillation Experiments' session).
- 2014, Co-Chair of the Organizing Committee, NuSTEC MC Generator School, Liverpool, May 14-16.

Mentoring

• 2015 - present, Academic advisor for over 20 undergraduate students at the University of Liverpool

Other

• 2018 - present, SBND Speakers Committee (Member, 2018-2019; Chair, 2019-present)

AWARDS AND PRIZES

- 2016-17, 2015, 2009, Institute of Particle Physics Phenomenology (Durham Univ.) Associateship awards
- 2016, Breakthrough Prize (shared Daya Bay, KamLAND, SNO, T2K, K2K and SuperK Collaborations)
- 2011, Le Prix La Recherche award (shared T2K Collaboration)
- 1999 2002, Greek National Scholarship Foundation (IKY) award

RESEARCH INCOME

Research funding in the UK in centralized. My current research is funded predominantly by the Science and Technology Facilities Council (STFC) through a) research grants awarded to the T2K-UK and DUNE-UK projects, b) a *Consolidated Grant* awarded to the Liverpool Particle Physics group, and c) support for in-house particle physics research programme at STFC's national laboratories and, in particular, at the Particle Physics Department of the Rutherford Appleton Laboratory.

Recent awards:

- 2019, Liverpool Particle Physics Consolidated Grant (Total award £6.9M), Co-Investigator
- 2018, European Space Agency, Positrino: Positioning, Navigation and Timing using Neutrinos, Proposal in response to ESA AO/1-9535/18/NL/MP in collaboration with GMV Innovating Solutions Ltd. (Total award €200k, €82k at Liverpool), Liverpool PI
- 2017, DUNE-UK project: Pre-construction proposal (Total award £4.0M, £300k at Liverpool), WP1 Coordinator and Liverpool Co-Investigator
- 2017, Liverpool Centre for Doctoral Training on Data Intensive Sciences, PhD project supervisor [Physics Simulations to Underpin Discoveries in the Neutrino Sector]
- 2015, Liverpool Particle Physics Consolidated Grant (Total award £6.8M), Co-Investigator
- 2014, LBNE and the Fermilab LAr Detector Programme: (Total award £2.5M, £160k at Liverpool), WP1 Coordinator

POST-DOC SUPERVISION

- 2019 2021, Dr. Christopher Barry (Liverpool)
- 2016 present, Dr. Marco Roda (Liverpool)

Roda's positions of responsibility:

- 2018 present: SBN Neutrino MC Generators WG co-Coordinator
- 2016 2019, Dr. Steve Dennis (Liverpool)

Dennis's positions of responsibility:

- 2017 - 2019: DUNE-UK WP1.1 - Near Detector Constraints and Oscillation Sensitivity Coordinator

STUDENT SUPERVISION

Postgraduate research

- 2021 present, Supervising Ms. Bethany Slater, University of Liverpool, PhD candidate. Thesis (tentative): 'Sterile neutrino search at the Fermilab Short Baseline Neutrino Program'.
- 2019 present, Supervising Mr. Jaiden Parlone, University of Liverpool, PhD candidate. Thesis (tentative): 'Three-Flavour Neutrino and Antineutrino Oscillation Measurements at the T2K Experiment'.
- 2018 present, Supervising Mr. Thomas Frank Ham, University of Liverpool, PhD candidate. Thesis (tentative): 'Electron shower energy reconstruction in Liquid Argon Time Projection Chambers and Electron Neutrino Appearance and Disappearance Studies the Fermilab Short Baseline Neutrino Program'.
- 2017 present, Supervising Ms. Julia Tena Vidal, University of Liverpool, PhD candidate. Thesis (tentative): 'Global analysis of neutrino scattering data for the characterization and tuning of the GENIE cross-section, neutrino-induced hadronization, and intranuclear rescattering models'. Recipient of the 2018 Leo Carrol (Liverpool HEP) award for outstanding post-graduate research.
- 2017 present, Supervising Mr. Jaggar Henzerling, University of Liverpool, PhD candidate. Thesis (tentative): 'Application of Machine Learning to Neutrino Event Reconstruction in the Short-Baseline Near Detector (SBND) Liquid Argon Time Projection Chamber and to Papillary Thyroid Cancer Diagnosis'.
- 2016 2021, Supervised Dr. Francis Bench, University of Liverpool, PhD 2021.
 Thesis: 'Study of Neutrino and Antineutrino Oscillations in the Three-Flavour PMNS Paradigm at the T2K Experiment: Determination of the CP-Violating Phase and the Search for ν̄_μ → ν̄_e Oscillations'. Recipient of the 2019 John G. Rutherglen memorial prize.
- 2016 2021, Co-supervised Dr. Rhiannon Jones, University of Liverpool, PhD 2021.

 Thesis: 'Muon Neutrino Disappearance with Multiple Liquid Argon Time Projection Chambers in the Fermilab Booster Neutrino Beam'.

 Present position: Post-Doctoral Research Associate at the University of Sheffield.
- 2014 2018, Supervised Dr. Christopher Barry, Univ. of Liverpool, PhD 2018.

 Thesis: 'Joint Analysis of Neutrino and Antineutrino Data from the T2K Experiment and Indications for Charge-Parity (CP) Violation', T2K-THESIS-108.
- 2011 2015, Co-supervised² Dr. Steve Dennis, RAL & University of Warwick, PhD 2015. Thesis: 'Muon-Antineutrino Disappearance and Non-Standard Interactions at the T2K Experiment', T2K-THESIS-069.

 Present position: Post-Doctoral Research Associate at the University of Cambridge.
- 2011 2014, Co-supervised³ Dr. Lorena Escudero Sanchez, CSIC and University of Valencia, PhD 2014. Thesis: 'Joint Analysis of Three Flavour Neutrino Oscillations Combining the Electron-Neutrino Appearance and Muon-Neutrino Disappearance Channels in the T2K Experiment', T2K-THESIS-070.

Present position: Post-Doctoral Research Associate at the University of Cambridge and Fellow of the Turing Institute.

- 2010 2014, Co-supervised Dr. Thomas Dealtry, RAL & University of Oxford, PhD 2014. Thesis: 'Muon-Neutrino Disappearance with the T2K Beam', T2K-THESIS-057. Present position: Post-Doctoral Research Associate at Lancaster University.
- 2008 2011, Co-supervised⁵ Dr. James Dobson, Imperial College London, PhD 2012.
 Thesis: 'Neutrino-Induced Charged-Current π⁺ Production at the T2K Near Detector', T2K-THESIS-019
 Present position: STFC Ernest Rutherford fellow at Imperial College London.

Undergraduate research

- 2019 2020, Mr. Jack Wells, University of Liverpool, MPHYS Project, Thesis: 'Deep Learning Applications in Neutrino Physics'.
- 2019 2020, Mr. Alex Barat, University of Liverpool, BSc Project Thesis: 'Investigation into the Possibility of Submarine Neutrino Communication'.

Recipient of the IFIC outstanding PhD thesis award.

 $^{^1{\}rm With}$ Prof. Christos Touramanis, University of Liverpool.

²With Prof. Gary Barker and Prof. Steve Boyd, University of Warwick.

³With Dr. Anselmo Cervera, IFIC.

 $^{^4\}mathrm{With}$ Prof. Alfons Weber, RAL & University of Oxford.

⁵With Prof. Yoshi Uchida, Imperial College London.

- 2017 2018, Mr. Reece Shaw, University of Liverpool, MPHYS Project. Thesis: 'Deep Learning Techniques for Neutrino Event Reconstruction and Identification in SBND'.
- 2017 2018, Mr. Josh Warren, University of Liverpool, MPHYS Project. Thesis: 'Deep Learning Techniques for Neutrino Event Reconstruction and Identification in SBND'.
- 2016 2017, Mr. Jake Jackson, University of Liverpool, MPHYS Project.

 Thesis: 'Sensitivity of Sterile Neutrino Searches at the Fermilab Short Baseline Neutrino Programme'.
- 2016 2017, Mr. Jack Ringwood, University of Liverpool, MPHYS Project.

 Thesis: 'Effects of Neutrino Interaction Uncertainties in Accelerator-Based Searches for Neutrino CPV'.
- 2016 2017, Mr. Jonathan Stott, University of Liverpool, MPHYS Project. Thesis: 'Effects of Neutrino Interaction Uncertainties in Accelerator-Based Sterile Neutrino Searches'.
- 2016 2017, Mr. James Taylor, University of Liverpool, MPHYS Project.

 Thesis: 'Statistical Issues in Precision Oscillation Measurements in Accelerator-Based Experiments'.

TEACHING

Higher Education teaching qualifications

• Fellow of the Higher Education Academy (FHEA). Skills, competences and professional practices were successfully benchmarked against the criteria (Descriptor 2) of the UK Professional Standards Framework (UKPSF) for teaching and support of learning in Higher Education.

Undergraduate teaching experience

- 2014-present, Module organiser and lecturer, PHYS 201 (Electromagnetism).
- 2015-20, Tutor, PHYS 480 (Advanced Quantum Physics).
- 2017-present, Tutor, PHYS 370 (Advanced Electromagnetism).
- 2016-present, Project supervisor, PHYS 498 (MPHYS Project) and PHYS 379 (BSc Project)
- 2014-present, Moderator and/or monitor for several modules.

Postgraduate research supervision experience

• 2008-present, Supervised 12 PhD theses (5 in progress, 7 completed). Please see above for details.

Postgraduate teaching experience

- 2019-present, Delivered postgraduate lectures in Neutrino Physics at the University of Liverpool.
- 2017, Lecturer (Simulation of Neutrino Interaction Physics), MCnet Summer School, Lund, Sweden.
- 2014, Tutor, UK High Energy Physics Summer School, University of Warwick.
- 2014, Lecturer, NuSTEC Neutrino Generator School, Liverpool.
- 2013, Tutor, UK High Energy Physics Summer School, University of Warwick.
- 2012, Tutor, UK High Energy Physics Summer School, Sommerville College, Oxford.
- 2009, Lecturer, 45th Karpacz Winter School in Theoretical Physics, Ladek-Zdroj, Poland.
- 2009, Lecturer, GENIE course, Fermilab.
- 2008, Lecturer, GENIE course, TRIUMF.
- 2007, Lecturer, GENIE course, Rutherford Appleton Lab.

PROFESSIONAL AFFILIATIONS

- 2018 present, Fellow of the Higher Education Academy
- 2010 present, Member of Institute Of Physics (IOP)
- 2000 present, Member of Hellenic Society for the Study of High Energy Physics (EESFYE)

RESEARCH COLLABORATION / GROUP MEMBERSHIPS

- 2014-present, DUNE (http://www.dunescience.org)
- 2014-present, SBND (http://sbn-nd.fnal.gov)
- 2007-present, T2K (http://t2k-experiment.org)
- 2010-present, VALOR [founder and coodinator] (https://valor.pp.rl.ac.uk)
- 2002-present, GENIE [founder and co-spokesperson] (http://www.genie-mc.org)
- 1999-2010, MINOS
- 1997-2003, DONUT
- 1997-1998, COSMOS

PRIMARY RESEARCH DIRECTIONS AND OBJECTIVES

My research is focussed on accelerator-based neutrino physics and, in particular, on the **experimental study of neutrino flavour oscillations**. I perform high-precision measurements of neutrino mixing in order to i) establish the possible existence of leptonic charge-parity (CP) invariance violation, and to identify its origin, and ii) to investigate the validity of the established 3-flavour paradigm, both through direct experimental searches for sterile neutrinos, and indirectly via over-constrained measurement of 3-flavour mixing. In addition, I perform **measurements of neutrino interaction characteristics** aiming to seed improvements in the phenomenology of neutrino-nucleus interactions and mitigate some of the dominant sources of systematic uncertainty in accelerator-based neutrino oscillation studies. I conduct my research on several experiments, maintaining a portfolio that includes running (**T2K**), near-future (**SBN/SBND**) and far-future experiments (**DUNE**). I also maintain a very active and visible research effort in **neutrino interaction phenomenology**, championing interdisciplinary research that spans the boundary between theory and experiment, as well as the boundary between particle and nuclear physics.

Performing world-leading neutrino mixing measurements is my most salient scientific research output. I am the founder and coordinator of the international VALOR neutrino fitting group⁶. The group was established within the T2K experiment in 2010 and it plays a pivotal role in the overall oscillation analysis output of the T2K experiment. Through personal analysis efforts, the coordination of the VALOR fitting group, and the supervision of several PhD students, I led numerous flagship T2K oscillation analyses and contributed to nearly all published T2K oscillation papers (details may be found in later sections). VALOR analyses of T2K data have produced some of the most precise measurements of neutrino mixing parameters to date and yielded tantalizing evidence for leptonic CP invariance violation. One of my research objectives is the continuation of the T2K physics exploitation and the improvement of the VALOR analysis techniques for the unprecedented exposure level and systematic error regime in which T2K now operates.

In the medium term, data from the Short-Baseline Neutrino (SBN) program at Fermilab will allow the most stringent tests of the hypothesis of light sterile neutrinos, with simultaneous measurements of muon-neutrino disappearance and electron-neutrino appearance/disappearance, and a generational advance in the study of neutrino interaction physics. I serve in the Executive Committee of SBND, the Near Detector of the SBN program, and I am Physics co-Coordinator for SBND, and Neutrino Oscillations and Systematics WG co-Coordinator for the overall SBN analysis effort. In this capacity I lead a host of analysis activities in preparation of neutrino data taking with both SBND and ICARUS, expected in 2022. My interest lies primarily in i) developing the vast neutrino interaction measurement programme possible at SBND, and ii) developing the SBN oscillation analysis paradigm, and unlocking the SBN physics potential through accurate SBND-driven spectrum extrapolations and systematic error constraints, the requirement on which surpasses that of DUNE. The SBN/SBND analysis activities will dominate my research effort in the medium term, leading to several seminal publications and unmatched experience in the analysis of LArTPC neutrino data that will secure a leadership position in the DUNE exploitation era. My group will play a central role bridging the DUNE physics exploitation with the SBN/SBND experience in the reconstruction, calibration and selection of LArTPC neutrino samples, and the construction of a sensitive oscillation analysis incorporating metgodologies for tuning and constraining instrumental LArTPC effects and neutrino-Argon interaction physics.

Another special interest of mine lies in the field of neutrino interaction phenomenology and computer simulations: I am the founder and co-Spokesperson of the international GENIE collaboration⁷ which

 $^{^6\}mathrm{VALOR}$ is a fitting group with about 15 currently active members from Cambridge, ETHZ, IFIC, Lancaster, Liverpool, UPenn and RAL. Details in <code>https://valor.pp.rl.ac.uk/</code>

⁷GENIE is a formal international collaboration of about 30 scientists from Bordeaux, Fermilab, Harvard, IFIC, ITEP, JINR, Liverpool, MIT, Pittsburgh, RAL and Tufts. Details in http://www.genie-mc.org

develops the well-known GENIE neutrino interaction physics simulation, as well as the corresponding global analysis of neutrino scattering data informing GENIE tunes and estimates of model uncertainties. GENIE performs influential phenomenology research in the boundary between nuclear and particle physics, and it provides an interface between theory and experiment. Amalgamating scarce experimental constraints and theoretical inputs into consistent, robust, efficient and predictive empirical models of neutrino interaction physics, as well as understanding the modelling uncertainties and limitations, underlies all modern neutrino data analysis efforts. Today, GENIE's predictions serve as a 'standard candle' and GENIE plays an important role for the exploitation of the world neutrino program and the design of future facilities. Indeed, the primary GENIE publication has over 870 citations to date, and it is one of the most-cited neutrino physics papers ever published. Its universal models, its extended capabilities (simulation of electron-nucleus and hadron-nucleus scattering, as well as simulation of beyond the standard model physics such as nucleon decay, $n-\bar{n}$ oscillation, boosted dark matter, and dark neutrinos), and state-of-the-art experimenal interfaces, makes GENIE one of the most widely-used physics generators in HEP. In addition, though its successful Incubator, GENIE provides an open platform and central coordination of community-wide generator development efforts, with over a hundred of contributors over the past few years. Continued development of GENIE remains one of my central research directions. My particular interest lies in the development, characterization and tuning of the comprehensive GENIE models, and my medium-term aim is to produce the definitive physics simulations for DUNE, for its early exploitation phase, by combining the most recent theories with the corpus of SBN measurements and producing GENIE Argon tunes.

RESEARCH HIGHLIGHTS

Main contributions to the SBND Experiment and to the overall SBN project

- Member of the SBND Executive Board (2020-present)
- SBN Oscillation Sensitivity and Systematics WG co-Coordinator (2018-present).
- SBND Physics co-Coordinator (2017-present).
- Development of ν_{μ} CC0 π event selection on SBND based on automated event reconstruction [Jones PhD].
- Development of VALOR-based ν_{μ} disappearance analysis [Jones PhD].
- Development of VALOR-based ν_e (dis)appearance analyses [Ham PhD].
- Development of Deep Learning methods for cosmic background rejection and neutrino event characterization [Henzerling PhD].
- Leading the development of the default SBN neutrino interaction physics simulation (GENIE).

Main contributions to the DUNE Experiment

- DUNE Near Detector Evaluation WG Coordinator (2015-2017).
- DUNE-UK WP.1 (Physics) co-Coordinator (2014-2019) in the period leading up to the publication of the DUNE Physics TDR and CD-2 approval.
- Led the development of an advanced VALOR-based joint 3-flavour oscillation and systematics constraint fit. This produced the first DUNE sensitiities incorporating simulated data from both Near and Far detectors, and informed the DUNE Near Detector task force report (2015).
- Leading the development of the default DUNE neutrino interaction physics simulation (GENIE).

Main contributions to the T2K Experiment

- Chair of the review committee of the first T2K Near detector ν_e disappearance (sterile) analysis (2013).
- Member of the ν_{μ} disappearance contour (statistics) committee (2011).
- Member of the paper committee for the first T2K Near detector ν_e disappearance paper (2014).
- Member of the paper committee for the first T2K ν_{μ} disappearance paper (2011).
- Both through personal analysis efforts and coordination of the VALOR fitting group, I delivered many official T2K oscillation analysis results:
 - Performed ν_{μ} -disappearance analyses of the T2K Run 1, Run 1-2, Run 1-3 and Run 1-4 [Dealtry PhD] datasets. The Run 1-2 result, published in PRD 85:031103 (2012), is the first ever published study of ν_{μ} -disappearance in an off-axis experiment. The subsequent results published in PRL 111:211803 (2013) and PRL 112:181801 (2014) are the world's most stringent constraint on the ν_{μ} -disappearance parameters.

- Performed the first T2K full 3-flavour oscillation analysis by combining the ν_{μ} -disappearance and ν_{e} -appearance analyses and performing a simultaneous measurement of Δm_{32}^2 , θ_{23} , θ_{13} and δ_{CP} . Full 3-flavour oscillation analyses were performed with the Run 1-3 and Run 1-4 datasets [Escudero PhD]. Our Run 1-4 results were published in PRD 91:072010 (2015).
- Performed the first T2K $\bar{\nu}_{\mu}$ -disappearance analysis with Run 5-6 data [Dennis PhD]. This result was published in PRL 116:181801 (2016).
- Performed a 3-flavour oscillation analysis combining all neutrino and antineutrino event samples with Run 1-8 data [Barry PhD]. This work, published in Phys.Rev. D96 (2017) no.9, 092006 and Phys. Rev. Lett. 121, 171802 (2018), produced first hints for leptonic CP violation.
- Performed the first T2K $\bar{\nu}_e$ -appearance analysis with Run 1-9 data [Bench PhD], published in Phys. Rev. Lett. 124, 161802 (2020).
- Performed the 3-flavour oscillation analysis combining all neutrino and antineutrino event samples with Run 1-9 data, published in Nature 580, 3390344 (2020) and Phys. Rev. D 103, 112008 (2021), as well as as statistics update with Run 1-10 data [Bench PhD]. These analyses produced the first strong indication for leptonic CP violation.
- Measured the rate of charged-current π^+ production in the T2K off-axis near detector [Dobson PhD].
- Developed event generation applications integrating the GENIE simulation engine with the JPARC neutrino beam-line simulations and T2K detector geometry descriptions.
- Developed methods for propagating neutrino interaction physics uncertainties in T2K physics analyses.
- Designed, prototyped, developed and commissioned the light-injection DAQ control software for the T2K off-axis near detector electromagnetic calorimeters.

Main contributions to the MINOS Experiment

- Physics Simulations Working Group co-convener (2006 2010): Made major intellectual contributions on the physics model and uncertainty evaluations used for all published MINOS results.
- Assembly and commissioning of Fully-Automated Stations (at Athens and UTA) for the Hamamatsu M16 multi-anode photo-multipliers (PMTs) used at the MINOS Far detector. Was responsible for the operation of the Athens Station and the full characterization of the PMTs tested there. Between November 2001 and December 2002, I tested and characterized almost half of all Far detector PMTs.
- Commissioning and data-taking operations of the MINOS 4 Plane Prototype (4PP), the first full integration of all MINOS Far detector sub-systems at Fermilab (June August 2000). Developed all offline software, analyzed the cosmic-ray and light-injection data, calibrated the prototype detector and characterized the prototype performance.
- Assembly and commissioning of the MINOS far detector in Soudan mine (September December 2002).

Main contributions to the DONUT Experiment

- Participation in the data-taking operations (July October 1997).
- Calibration of the electromagnetic calorimeter.

Main contributions to the COSMOS Experiment

- Exposure of a prototype electromagnetic calorimeter at a Fermilab test-beam (July October 1997).
- Calibration of a prototype electromagnetic calorimeter.

PRESENTATIONS AT WORKSHOPS, CONFERENCES, SEMINARS

International Physics Workshops, Symposia and Conferences

- 'Systematics: The Neutrino Experiment Experience' (Invited talk), PHYSTAT-\nu 2019, 22-25 January 2019, CERN.
- 'GENIE Status and Prospects' (Invited talk), H2020 Oscillation Physics Workshop, 28-29 November 2018, Valencia, Spain.
- 'The AGKY Hadronization Model' (Invited talk), NuSTEC Workshop on Shallow- and Deep-Inelastic Scattering, 11-13 October 2018, Gran Sasso Science Institute (GSSI), L'Aquila, Italy.
- 'Simulations of Neutrino Interaction Physics', MCnet Monte Carlo School, 2-7 July 2017, Lund, Sweden

- 'The Short-Baseline Neutrino Detector (SBND)' (Invited talk), 11th International Workshop on Neutrino-Nucleus Interactions (NuINT17), 25-30 June 2017, Toronto, Canada.
- 'Neutrino-Nucleus Interaction Cross-Sections' (Invited talk), Conference on Science at the Sanford Underground Research Facility (CoSSURF) 2017, 12-16 May 2017, Rapid City, SD, USA.
- 'The VALOR Oscillation Analysis in T2K/HK, DUNE and SBN' (Invited talk), Topical Meeting on Neutrino-Nucleus Scattering, 18-20 April 2017, Durham, UK.
- 'Neutrino-Nucleus Interaction Measurements at the few-GeV Energy Scale: Relevance, Present Status and Future Prospects' (Invited Talk), 25th International Workshop on Deep Inelastic Scattering and Related Topics (DIS17), 3-7 April 2017, Birmingham, UK
- 'High-Pressure Gaseous Argon Time Projection Chamber (HPGArTPC) Near Detector (ND) Concept: Evaluation of Systematic Constraints and Impact on Charge-Parity (CP) Symmetry Violation Sensitivity', 2nd Workshop on Neutrino Near Detectors based on gas TPC, 20-21 March 2017, CERN.
- 'GENIE Status and Prospects' (Invited talk), International Workshop on Frontiers in Electroweak Interactions of Leptons and Hadrons (EILH16), 2-6 November 2016, Aligarh, India.
- 'GENIE Update' (Invited talk), 10th International Workshop on Neutrino-Nucleus Interactions (NuINT15), 16-21 November 2015, Osaka, Japan.
- 'Experimental Neutrino Physics' (Invited lecture), CORFU14 Summer School and Workshop on the Standard Model and Beyond, 3-14 September 2014, Mon-Repos, Corfu, Greece.
- 'LBNE Flux and Cross-Section Systematic Constraints for 3-Flavour Oscillation Sensitivity Simulation', CETUP*14, 10-31 July 2014, Lead, SD, USA.
- 'GENIE Update' (Invited talk), 9th International Workshop on Neutrino-Nucleus Interactions (NuINT14), 19-24 May 2014, London, UK.
- 'T2K Status and Prospects' (Invited talk), International Committee for Future Accelerators (ICFA) European Neutrino Town Meeting, 8-10 January 2014, Paris Diderot University, France.
- 'Electron scattering data and its use in constraining neutrino models' (Invited review talk), 6th International Workshop on Neutrino-Nucleus Interactions (NuINT09), 18-22 May 2009, Sitges, Spain.
- 'The path forward: Monte Carlo convergence' (Invited talk), 6th International Workshop on Neutrino-Nucleus Interactions (NuINT09), 18-22 May 2009, Sitges, Spain.
- 'The GENIE Universal Neutrino MC Generator', 45th Karpacz Winter School in Theoretical Physics (Neutrino interactions: from theory to MC simulations), 2-11 February, 2009, Lądek-Zdrój, Poland.
- 'Recent Results from the MINOS Experiment' (Invited talk), International Nuclear Physics Conference 2007 (INPC-2007), 3-8 June 2007, Tokyo, Japan.
- 'Recent Results from the MINOS Experiment' (Invited talk), International Workshop on Double Beta Decay & Neutrinos (DBD-2007), 11-13 June 2007, Osaka, Japan.
- 'Overview of Progress in Neutrino Simulation Codes' (Invited review talk), 5th International Workshop on Neutrino-Nucleus Interactions (NuINT07), 31 May 3 June 2007, Fermilab, Chicago IL, USA.
- 'The GENIE Universal Neutrino MC Generator' (Invited talk), 3rd International Scoping Study', 24-28 April 2006, Rutherford Appleton Lab, UK.
- 'Neutrino MC Generators and Nuclear Effects' (Invited talk), 20th Max Born Symposium (Nuclear Effects in Neutrino Interactions), 7-11 December 2005, Wroclaw, Poland.
- 'The GENIE Universal Neutrino MC Generator', 4th International Workshop on Neutrino-Nucleus Interactions (NuINT05), 26-29 September 2005, Okayama University, Okayama, Japan.
- 'Neutrino Interaction Physics and Neutrino MC Event Generators' (Invited talk), Next Generation of Nucleon Decay and Neutrino Detectors (NNN05), 7-9 April 2005, Aussois, Savoie, France.
- 'Neutrino Interaction Model Validation', 3rd International Workshop on Neutrino-Nucleus Interactions (NuINT04), 17-21 March 2004, Laboratori Nazionali del Gran Sasso INFN, Assergi (L'Aquila), Italy.
- 'The MINOS Experiment: Current Status and Atmospheric Neutrino Studies', Recent Advances in High Energy Physics (HEP2003) Annual Meeting Of The Hellenic Society For The Study Of High Energy Physics, 17-29 April 2003, Athens, Greece.

- 'MINOS Experiment: Characterization of multi-anode PMTs for the MINOS detectors', Recent Advances in High Energy Physics (HEP2002) Annual Meeting Of The Hellenic Society For The Study Of High Energy Physics, 25-27 April, 2002, Patra, Greece.
- 'Development of the MINOS detectors', Recent Advances in High Energy Physics (HEP2001) Annual Meeting Of The Hellenic Society For The Study Of High Energy Physics, 6-8 April 2001, Heraklion, Greece.
- 'MINOS: Prototype Detector and Toroidal Magnetic Field', Recent Advances in High Energy Physics (HEP2000) Annual Meeting Of The Hellenic Society For The Study Of High Energy Physics, April 2000, Ioannina, Greece.

Seminars and Colloquia

- \bullet 'Neutrino-Nucleus Interactions at the few-GeV Energy Scale', CERN-TH Colloquium, 05/02/2020.
- 'Neutrino-Nucleus Interaction Simulations', University of Surrey, 01/05/2018.
- 'Recent results from the T2K experiment on CP violation', Cambridge University, 07/03/2017.
- 'Neutrino Oscillation Results from T2K', Manchester University, 19/01/2012.
- 'Neutrino Oscillation Results from T2K', Birmingham University, 19/10/2011.
- 'First Neutrino Oscillation Results from T2K', University College London, 27/05/2011.
- 'First Neutrino Oscillation Results from T2K', Rutherford Appleton Lab, 25/05/2011.
- 'First Neutrino Oscillation Results from T2K', Sussex University, 12/05/2011.
- 'First Neutrino Oscillation Results from T2K', Cambridge University, 10/05/2011.
- 'First Neutrino Oscillation Results from T2K', Bristol University, 04/05/2011.
- 'Neutrino Interaction Modeling and Systematic Uncertainties', IPPP Durham, 25/01/2010.
- 'Neutrino Interaction Modeling and Systematic Uncertainties', Paris LPNHE, GDR Neutrino, 27-28/04/2009.
- 'The GENIE Neutrino MC Generator', Imperial College London, 18/03/2008.
- 'Feedback from the NuINT07, INPC07 and DBD07 conferences', Rutherford Appleton Lab, 08/08/2007.
- 'Neutrino Interaction Phenomenology', Rutherford Appleton Lab, 03/03/2006.
- 'The GENIE Neutrino MC Generator', Strasbourg IReS, GDR Neutrino, 02-03/02/2006.
- 'The MINOS Experiment: First Beam Data and Neutrino-Interaction Modeling', Imperial College London, 17/11/2005.
- 'Feedback from the NuINT05 conference', Rutherford Appleton Lab, 02/11/2005.
- 'Neutrino Oscillations & Interactions: A Review', Rutherford Appleton Lab, 22/10/2004.
- 'The MINOS Experiment', University College London, 27/05/2004.
- 'Feedback from the NuINT04 conference', Rutherford Appleton Lab, 28/04/2004.
- 'MINOS: Detector Development and Data Exploitation', Rutherford Appleton Lab, 15/10/2003.

LIST OF PUBLICATIONS AND INTERNAL NOTES

Citations Summary	
Number of published papers	90
Number of citations	14,679
Citations per paper (average)	149.8
h-index	51

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Peer-reviewed journal papers (Neutrino interaction phenomenology)

- The GENIE Collaboration (L. Alvarez-Ruso et al.), Recent highlights from GENIE v3. Accepted for publication by Euro.Phys.J. Special Topics (arXiv:2106.09381 [hep-ph])
- The GENIE Collaboration (J. Tena Vidal et al.), AGKY Hadronization Model Tuning in GENIE v3. Submitted to Phys. Rev. D. (arXiv:2106.05884 [hep-ph])
- The GENIE Collaboration (J. Tena Vidal et al.), Neutrino-Nucleon Cross-Section Model Tuning in GENIE v3. Accepted for publication by Phys. Rev. D (arXiv:2104.09179 [hep-ph])
- C. Wilkinson et al., Testing CCQE and 2p2h models in the NEUT neutrino interaction generator with published datasets from the MiniBooNE and MINERvA experiments, 19 pp., Published 21 April 2016, Phys.Rev. D93, 072010 (2016).
- The GENIE Collaboration (C. Andreopoulos et al.), The GENIE Neutrino Monte Carlo Generator, 34 pp., Published 21 February 2010, Nucl.Instrum.Meth. A614 (2010) 87-104. [>870 citations]
- T.Yang, C.Andreopoulos, H.Gallagher, K.Hoffmann and P.Kehayias, A Hadronization Model for few-GeV Neutrino Interactions, 15 pp., Published 01 August 2009, Eur.Phys.J. C63 (2009) 1-10. [>90 citations]

Peer-reviewed journal papers (DUNE experiment)

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- The DUNE Collaboration (B. Abi et al.), Supernova neutrino burst detection with the Deep Underground Neutrino Experiment. Published 15 May 2021, Eur.Phys.J.C 81 (2021) 5, 423.
- The DUNE Collaboration (B. Abi et al.), First results on ProtoDUNE-SP liquid argon time projection chamber performance from a beam test at the CERN Neutrino Platform. Published 3 December 2020, JINST 15 (2020) 12, P12004.
- The DUNE Collaboration (B. Abi et al.), Neutrino interaction classification with a convolutional neural network in the DUNE far detector. Published 9 November 2020, Phys.Rev.D 102 (2020) 9, 092003.
- The DUNE Collaboration (B. Abi et al.), Long-baseline neutrino oscillation physics potential of the DUNE experiment. Published 22 October 2020, Eur.Phys.J.C 80 (2020) 10, 978.
- The DUNE Collaboration (B. Abi et al.), Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume III: DUNE Far Detector Technical Coordination. Published 27 August 2020, JINST 15 (2020) 08, T08009.
- The DUNE Collaboration (B. Abi et al.), Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume IV: Far Detector Single-phase Technology, JINST 15 (2020) 08, T08010.
- The DUNE Collaboration (B. Abi et al.), Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume I Introduction to DUNE, JINST 15 (2020) 08, T08008.

Peer-reviewed journal papers (SBND experiment)

- The SBND Collaboration (R. Acciarri et al.), Cosmic Background Removal with Deep Neural Networks in SBND. Published 24 August 2021, Frontiers in Artificial Intelligence, Vol 4 (2021), 42.
- The SBND Collaboration (R. Acciarri et al.), Construction of Precision Wire Readout Planes for the Short-Baseline Near Detector (SBND), JINST 15 (2020) 06, P06033.

Peer-reviewed journal papers (T2K experiment)

- The T2K Collaboration (K. Abe et al.), First T2K measurement of transverse kinematic imbalance in the muon-neutrino charged-current single-π⁺ production channel containing at least one proton. Published 21 June 2021, Phys. Rev. D 103 (2021) 11, 112009.
- The T2K Collaboration (K. Abe et al.), Improved constraints on neutrino mixing from the T2K experiment with 3.13 ×10²¹ proton on target. Published 16 June 2021, Phys.Rev.D 103 (2021) 11, 112008.
- The T2K Collaboration (K. Abe et al.), T2K measurements of muon neutrino and antineutrino disappearance using 3.13×10^{21} proton on target. Published 26 January 2021, Phys.Rev.D 103 (2021) 1, L011101.
- The T2K Collaboration (K. Abe et al.), Measurements of $\bar{\nu}_{\mu}$ and $\bar{\nu}_{\mu} + \nu_{\mu}$ charged-current cross-sections without detected pions nor protons on water and hydrocarbon at mean neutrino energy of 0.86 GeV. Published 02 March 2021, PTEP 2021 (2021) 4, 043C01.

- The T2K Collaboration (K. Abe et al.), Simultaneous measurement of the muon neutrino charged-current cross section on oxygen and carbon without pions in the final state at T2K. Published 16 June 2020, Phys. Rev. D 101 (2020), 11, 112004.
- The T2K Collaboration (K. Abe et al.), Measurement of the charged-current electron (anti-)neutrino inclusive cross-sections at the T2K off-axis near detector ND280. Published 19 October 2020, JHEP 10 (2020) 114.
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- The T2K Collaboration (K. Abe et al.), Search for Electron Antineutrino Appearance in a Long-baseline Muon Antineutrino Beam. Published 21 April 2020, Phys.Rev.Lett. 124 (2020) 16, 161802.
- The T2K Collaboration (K. Abe et al.), Measurement of Neutrino and Antineutrino Neutral-Current Quasielastic-like Interactions on Oxygen by Detecting Nuclear Deexcitation γ rays. Published 30 December 2019, Phys.Rev. D100 (2019) no.11, 112009.
- The T2K Collaboration (K. Abe et al.), Constraint on the Matter-Antimatter Symmetry-Violating Phase in Neutrino Oscillations. Published 15 April 2020, Nature 580 (2020) 7803, 339-344.
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- The T2K Collaboration (K. Abe et al.), Measurement of ν_{μ} and $\bar{\nu}_{\mu}$ charged current inclusive cross sections and their ratio with the T2K off-axis near detector, 15 pp., Published 05 September 2017, Phys. Rev. D96 (2017) no. 5, 052001.

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- The T2K Collaboration (K. Abe et al.), Search for Lorentz and CPT violation using sidereal time dependence of neutrino flavor transitions over a short baseline, 9 pp., Published 29 June 2017, Phys.Rev. D95 (2017) no.11, 111101.
- The T2K Collaboration (K. Abe et al.), Combined Analysis of Neutrino and Antineutrino Oscillations at T2K, 9 pp., Published 10 April 2017, Phys. Rev. Lett 118 (2017) no. 15, 151801.
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- The T2K Collaboration (K. Abe et al.), Measurement of the Muon Neutrino Inclusive Charged-Current Cross Section in the Energy Range of 1-3 GeV with the T2K INGRID Detector, 23 pp., Published 05 April 2016, Phys. Rev. D93 (2016) 072002.
- The T2K Collaboration (K. Abe et al.), Upper bound on neutrino mass based on T2K neutrino timing measurements, 15 pp., Published 27 January 2016, Phys.Rev. D93 (2016), 012006.
- The T2K Collaboration (K. Abe et al.), Measurement of the ν_{μ} charged-current quasielastic cross-section on carbon with the ND280 detector at T2K, 14 pp., Published 11 December 2015, Phys.Rev. D92 (2015) 112003.
- The T2K Collaboration (K. Abe et al.), Measurement of the Electron Neutrino Charged-Current Interaction Rate on Water with the T2K ND280 π^0 Detector, 11 pp., Published 19 June 2015, Phys.Rev. D91 112010 (2015).
- The Hyper-Kamiokande Proto-Collaboration (K. Abe at al.), Physics potential of a long-baseline neutrino oscillation experiment using a J-PARC neutrino beam and Hyper-Kamiokande, 35 pp., Published 19 May 2015, PTEP 2015 (2015) 053C02.
- The T2K Collaboration (K. Abe et al.), Measurement of the ν_{μ} charged current quasielastic cross section on carbon with the T2K on-axis neutrino beam, 17 pp., Published 04 June 2015, Phys.Rev. D91,112002 (2015).
- The T2K Collaboration (K. Abe et al.), Measurements of neutrino oscillation in appearance and disappearance channels by the T2K experiment with 6.6×10^{20} protons on target, 50 pp., Published 29 April 2015, Phys.Rev. D91 (2015) 072010.
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- The T2K Collaboration (K. Abe et al.), Precise Measurement of the Neutrino Mixing Parameter θ_{23} from Muon Neutrino Disappearance in an Off-axis Beam, 8 pp., Published 08 May 2014, Phys. Rev. Lett. 112 (2014) 181801.
- The T2K Collaboration (K. Abe et al.), Measurement of the Instrinsic Electron Neutrino Component in the T2K Neutrino Beam with the ND280 Detector, 18 pp., Published 05 May 2014, Phys.Rev. D89 (2014) 092003.
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- The T2K Collaboration (K. Abe et al.), The T2K Neutrino Flux Prediction, 34 pp., Published 29 January 2013, Phys. Rev. D87 (2013) 012001.
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- The MINOS Collaboration (P. Adamson et al.), Neutrino and Antineutrino Inclusive Charged-Current Cross Section Measurements with the MINOS Near Detector, 33 pp., Published 8 April 2010, Phys. Rev. D81 (2010) 072002.
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- C. Andreopoulos et al., T2K 14.938×10²⁰-POT Neutrino and 11.236×10²⁰-POT Anti-Neutrino (Run 1-9) Joint 5-Sample 3-Flavour Analysis (2018), 85 pp., Last revision published 28 September 2018, T2K Technical Note T2K-TN-360.
- C. Andreopoulos et al., T2K 14.938×10²⁰-POT Neutrino and 11.236×10²⁰-POT Anti-Neutrino (Run 1-9) $\bar{\nu}_e$ Appearance Analysis (2018), 30 pp., Last revision published 26 May 2018, T2K Technical Note T2K-TN-356.
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