

Dimitrios K. Papoulias

- Date of birth: 20/01/1989
- Origin: Greek
- Military obligation: completed
(**Career-break 2016-2017**)

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Education

- **University of Ioannina** Ioannina, Greece
BSc in Physics Grade: 7.71/10 Very Good (within 2% of class-2006) 10/2006 - 7/2010
 - Thesis: “*Stellar Evolution and Thermonuclear Reactions: Exotic Nuclei and their role on the Neutrino Propagation through Neutron Stars*”
 - Supervisor: *Prof. T.S. Kosmas*
- **University of Sussex** Brighton, UK
MSc in Theoretical Particle Physics Grade: Merit 71.467/100 11/2010 - 8/2011
 - Thesis: “*Neutrino Phenomenology and Leptogenesis*”
 - Supervisors: *Prof. S.J. Huber* and *Prof. S.J.M. Peeters*
- **University of Ioannina** Ioannina, Greece
PhD in Theoretical Nuclear Physics 11/2011 - 2/2016
 - Thesis: “*Exotic Lepton Flavour Violating Processes in the Field of Nucleus*”
 - Supervisor: *Prof. T.S. Kosmas*

Academic Experience

- June/2022–, Postdoctoral Researcher: Division of Particle and Nuclear Physics / Univ. of Athens (Prof. N. Saoulidou)
- 16/02/2020-16/02/2022, Postdoctoral Researcher: Division of Theoretical Physics / Univ. of Ioannina (Prof. G.K. Leontaris)
- 13/11/2018-15/02/2020, Postdoctoral Researcher: AHEP Group at IFIC, CSIC / Univ. de Valencia (Dr. M. Tórtola - Prof. J. W.F. Valle)
- 10/03/2018-10/11/2018, Research Associate (postdoc level, unpaid), NCSR Demokritos. (Prof. C. Papadopoulos–Prof. S. Lola)
- 10/01/2017-30/08/2017, Research Associate (postdoc level, unpaid), University of Ioannina. (Prof. T.S. Kosmas)
- 6/11/2014-5/11/2015, Researcher: AHEP Group at IFIC, CSIC / Univ. de Valencia (Prof. J. W.F. Valle)
”*Prometeu per a grups d’ investigació d’ Excel·lència de la Conselleria d’ Educació, Cultura i Esport, CPI-14-289*” (GVPROMETEOII2014-084).
- 1/03/2013-30/4/2013, Teaching Assistant, University of Ioannina.

- 1/09/2012-31/10/2012, Teaching Assistant, University of Ioannina.

Research Interests

- **BSM neutrino phenomenology**
 - Non-Standard Interactions (NSI, Z' models, scalar etc.),
 - Neutrino electromagnetic properties (transition magnetic moments, milli-charges, charge-radius etc).
 - Neutrino oscillations (Sterile neutrinos, Non-Unitarity)
- **Dark-Matter Direct Detection**
 - WIMP-nucleon/nucleus processes
 - primordial black holes
 - neutrino-floor
- **Nuclear structure**
 - QRPA calculations
 - Shell-Model
 - Deformed Shell-Model
- **Neutrino-nucleon processes** (SM, NSI)
- **Charged Lepton Flavour Violation** ($\mu \rightarrow e$ conversion in nuclei, $\mu \rightarrow e\gamma$ and $\mu \rightarrow eee$)
- **Neutrino Leptogenesis**

Languages

1. English (fluent)
2. French (good)

IT Skills

- International Diploma in IT Skills Standard, University of Cambridge International Examinations, Full Certificate, 2009
- packages: Mathematica, Matlab, SPSS, SQL, R, Origin, KNIME Workflow, PROMETHEE, LabView, Multisim
- programming languages: FORTRAN, C, Python (NumPy, SciPy, Cython, Numba, etc.)
- graphics: PGFPLOTS, GNUPLOT

- office: Microsoft Office, LaTeX

Teaching Experience (as teaching assistant)

1. Classical Mechanics I: 2011-12 and 2012-2013
2. Group Theory: 2011-2012
3. Vector Calculus: 2013-2014 and 2014-2015 (partly)
4. Statistical Physics I: 2014-2015 (partly)

Participation in Schools

- Invisibles21 School April 12th to May 7th, 2021
- Master & PhD Course: Effective Field Theory, 20/04-23/04 2015, University of Valencia, lectures by Prof. A. Pich, IFIC, CSIC / Univ. de Valencia.

Participation in Conferences/Workshops

1. HEP 2012: Recent Developments in High Energy Physics and Cosmology, Ioannina, Greece, April 5-8 2012 (participation).
2. HNPS 2012: 21st Symposium of the Hellenic Nuclear Physics Society, 25-26 May 2012, NCSR Demokritos, Athens, Greece, talk: "*Lepton-flavour violating neutral-current exotic ν -nucleus processes*".
3. International Conference on Mathematical Modeling in Physical Sciences, IC-MSQUARE, September 3-7, 2012, Budapest, Hungary.
4. HINP 2012: 1st One-Day Workshop on New Aspects and Perspectives in Nuclear Physics, 8th of September, 2012 Ioannina, Greece, talk: "*Flavour Changing Neutral-Current Processes in Nuclei*".
5. HNPS 2013: 22nd Symposium of the Hellenic Nuclear Physics Society, 31 May - 1 June 2012, University of Athens, Athens, Greece, talk: "*Studying background processes of the exotic neutrino-nucleus reactions*".
6. HINP 2014: 2nd One-Day Workshop on New Aspects and Perspectives in Nuclear Physics April 12th, 2014 - Thessaloniki, Greece, talk: "*Exotic neutrino physics issues and nuclear theory*".
7. HNPS 2014: 23rd Symposium of the Hellenic Nuclear Physics Society June 20-21, 2014, Aristotle University of Thessaloniki, Greece, talk: "*Nuclear study of the exotic neutrino interactions*".
8. HNPS 2015: 24th Symposium of the Hellenic Nuclear Physics Society May 22-23, 2015, University of Ioannina, Greece, talk: "*Probing electromagnetic neutrino properties within the non-standard neutrino nucleus interactions*".

9. PLANCK2015: 18th International Conference From the Planck Scale to the Electroweak Scale 25-29 May 2015, Ioannina, Greece (participation).
10. IVICFA: THEORETICAL PHYSICS I workshop 18 September 2015, Parque Científico, Universitat de Valencia, Spain (participation).
11. HNPS 2017: 26th Symposium of the Hellenic Nuclear Physics Society June 8-9, 2017, Hellenic Centre for Marine Research (HCMR), Greece, talk: *“Exploring Lepton-Flavour Violating Processes Through Neutrino Detection”*.
12. HEP 2018: Recent Developments in High Energy Physics and Cosmology, March 28 - April 1, 2018, National Technical University of Athens, Greece (participation).
13. HNPS 2018: 27th Symposium of the Hellenic Nuclear Physics Society June 9-10, 2018, National and Kapodistrian University of Athens, Greece, talk: *“Constraining new physics from the first observation of coherent elastic neutrino-nucleus scattering”*.
14. The magnificent CE ν NS: November 2-3 2018, University of Chicago, Chicago, IL, USA, talk: *Neutrino constraints on conventional and exotic CE ν NS interactions*
15. H2020 Oscillation Physics workshop: November 28-29 2018, IFIC, CSIC/Univ. de Valencia, Valencia, Spain (participation)
16. The quest for new physics: December 12-14 2018, IFIC, CSIC/Univ. de Valencia, Valencia, Spain (participation)
17. 15th MultiDark Consolider Workshop: April 3-5, 2019, Zaragoza U., Spain, talk *“Neutrino-floor with nuclear structure calculations”*
18. Neutrino GDR: June 25-26, 2019, University of Pierre et Marie Curie, Paris, France, talk *Probing neutrino transition magnetic moments with coherent elastic neutrino-nucleus scattering*
19. 41st International School of Nuclear Physics (Erice 2019): September 16-24, 2019, Sicily, Italy, talk: *Probing Neutrino Transition Magnetic Moments at CE ν NS Experiments*
20. Magnificent CE ν NS 2019: November 9-11 2019, Chapel Hill, NC, USA, talk: *Neutrino transition magnetic moments and sterile neutrinos from CE ν NS*
21. Neutrino 2020-Virtual Meeting: June 22-July 2, 2020, hosted by Fermilab, USA (participation)
22. ICHEP 2020 (virtual meeting): 28 Jul - 6 Aug 2020, hosted by (participation)
23. [Snowmass 2021 Neutrino Frontier](#) (virtual workshop): August 12, 2020, talk: *Neutrino electromagnetic properties and non-standard interactions in the light of the XENON1T excess*
24. Magnificent CE ν NS 2020 (virtual meeting): November 16-20 2020 (participation)
25. Beyond Standard Model: From Theory to Experiment (BSM- 2021), March 29–April 2021 (participation)
26. WIN2021: 28th International Workshop on Weak Interactions and Neutrinos, June 7 – 11, 2021, University of Minnesota USA, poster: *New physics from the first detection of coherent elastic neutrino-nucleus scattering (CE ν NS) with Liquid Argon*
27. HEP 2021: 38th Conference on Recent Developments in High Energy Physics and Cosmology 16-19 June 2021, Thessaloniki, Greece, talk: *Probing new physics with nuclear and electron recoils*

28. TAUP 2021: 17th International Conference on Topics in Astroparticle and Underground Physics, IFIC-Valencia U., Spain, talk: *“Probing exotic neutrino physics with CEvNS and neutrino-electron scattering”*
29. PANIC 2021: 22nd Particles and Nuclei International Conference, Lisbon, Portugal, talk: *“Particles and Nuclei International Conference”*
30. NuFACT 2021: 22nd International Workshop on Neutrinos from Accelerators, INFN-Cagliari, Italy, talk: *“Probing axion-like particles with reactor neutrino experiments”*
31. Magnificent CEvNS 2021 (virtual meeting): October 6–7, 2021, talk: *“Low-energy CEvNS probes of neutrino electromagnetic properties”*
32. 18th MultiDark Consolider Workshop: October 18-20, 2021, La Rábida, Huelva, Spain, talk: *“Data-driven neutrino floor”*
33. MITP Topical Workshop: May 23-27, 2022, Mainz, Germany, talk: *“New physics directions from CEvNS”*
34. HNPS 2022: 30th Symposium of the Hellenic Nuclear Physics Society October 7-8, 2022, University of Ioannina, Greece, talk: *“The neutrino floor: a data-driven analysis”*
35. Magnificent CEvNS 2023: March 22-25, 2023, Munich, Germany, talk: *“Probing electroweak physics with COHERENT data”*

Invited Talks

1. MPIK Seminar, June 20, 2022, Heidelberg, Germany
2. Section of Nuclear and Particle Physics, June 14, 2022, Athens U., Greece
3. MITP Topical Workshop: May 23-27, 2022, Mainz, Germany
4. IFIC Seminar: May 24 2022, Valencia, Spain
5. NCSR Demokritos, November 23, 2021, Athens, Greece [link](#).
6. [NEWS Colloquium](#), June 24th. 2021 Uni. of Osaka Japan
7. Graviticulas Seminar, June 3, 2021 Pontificia Universidad Católica de Chile
8. [Snowmass 2021 Neutrino Frontier](#) (virtual workshop): August 12, 2020
9. Neutrino GDR: June 25-26, 2019, University of Pierre et Marie Curie, Paris, France
10. The magnificent CEvNS: November 2-3, 2018, Enrico Fermi Institute (EFI) and the Kavli Institute for Cosmological Physics, Chicago, IL, USA.
11. University College London: March 15-16 2018, London, UK.
12. NCSR Demokritos, March 4 2016, Athens, Greece.

Publications in Proceedings of National Conferences

1. D.K. Papoulias and T.S. Kosmas, “Coherent neutrino scattering off the ^{48}Ti nucleus” [HNPS Proceedings \(2012\)](#), 104-111.
2. HINP 2012:1st One-Day Workshop on New Aspects and Perspectives in Nuclear Physics, 8th of September, 2012 Ioannina, Greece, “[Flavour Changing Neutral-Current Processes in Nuclei](#)”.
3. D.K. Papoulias and T.S. Kosmas “Studying background processes of the exotic neutrino-nucleus reactions”, [HNPS Proceedings \(2013\)](#), 11-15.
4. HINP 2014: 2nd One-Day Workshop on New Aspects and Perspectives in Nuclear Physics April 12th, 2014 - Thessaloniki, Greece, “[Non standard neutrino interactions at the Spallation Neutron Source](#)”.
5. D.K. Papoulias and T.S. Kosmas, “Nuclear study of the exotic neutrino interactions”, [HNPS Proceedings \(2014\)](#), 79-83.
6. D.K. Papoulias and T.S. Kosmas, “Probing electromagnetic neutrino properties within the tensor non-standard neutrino-nucleus interactions”, [HNPS Proceedings \(2015\)](#), 119-125.
7. D.K. Papoulias and T.S. Kosmas, “Constraining new physics from the first observation of coherent elastic neutrino-nucleus scattering”, [HNPS Proceedings \(2018\)](#), 17-24.
8. T.S. Kosmas, V.K.B. Kota, D.K. Papoulias and R. Sahu, “Coherent elastic neutrino-nucleus scattering ($\text{CE}\nu\text{NS}$) event rates for Ge, Zn and Si detector materials”, [HNPS Proceedings \(2021\)](#), 261-264.
9. D.K. Papoulias, “The neutrino floor: a data-driven analysis”, [HNPS Proceedings \(2022\)](#), 100-106.

Publications in Refereed Conference Proceedings

1. D.K. Papoulias and T.S. Kosmas: “*Exotic Lepton Flavour Violating Processes in the Presence of Nuclei*”, [J.Phys.Conf.Ser. 410 \(2013\) 012123](#).
2. D. Aristizabal Sierra et al.: “*Proceedings of The Magnificent $\text{CE}\nu\text{NS}$ Workshop 2018*”, [10.5281/zenodo.3489190](#), [arXiv:1910.07450 \[hep-ex\]](#).
3. O.G. Miranda, D.K. Papoulias, G. Sanchez Garcia, O. Sanders, M. Tórtola, J.W.F. Valle “*Probing exotic neutrino physics with $\text{CE}\nu\text{NS}$* ”, [J.Phys.Conf.Ser. 2156 \(2021\) 012132](#)
4. D. Aristizabal Sierra, V. De Romeri, L.J. Flores, D.K. Papoulias: “*Probing axion-like particles with reactor neutrino experiments*”, [PoS\(NuFact2021\)090](#).
5. G. Miranda, D.K. Papoulias, O. Sanders, M. Tórtola, J.W.F. Valle “*Future sensitivity on unitarity, light-sterile neutrinos and neutrino magnetic moment from low-energy experiments*”, [PoS\(PANIC2021\)277](#).
6. D.K. Papoulias: “ *$\text{CE}\nu\text{NS}$ nuclear physics aspects*”, [PoS\(PANIC2021\)265](#).

Publications in Refereed Scientific Journals

1. D.K. Papoulias and T.S. Kosmas: “*Nuclear aspects of neutral current non-standard ν -nucleus reactions and the role of the exotic $\mu^- \rightarrow e^-$ transitions experimental limits*”, *Phys.Lett.* **B728** (2014) 482-488.
2. D.K. Papoulias and T.S. Kosmas: “*Standard and non-standard neutrino-nucleus reactions cross sections and event rates to neutrino detection experiments*”, *Adv.High Energy Phys.* **2015** (2015) 763648.
3. D.K. Papoulias and T.S. Kosmas: “*Neutrino transition magnetic moments within the non-standard neutrino-nucleus interactions*”, *Phys.Lett.* **B747** (2015) 454-459.
4. T.S. Kosmas, O.G. Miranda, D.K. Papoulias, Tórtola and J.W.F. Valle: “*Probing neutrino magnetic moments at the Spallation Neutron Source facility*”, *Phys. Rev.* **D92** (2015) 013011.
5. T.S. Kosmas, O.G. Miranda, D.K. Papoulias, Tórtola and J.W.F. Valle: “*Sensitivities to neutrino electromagnetic properties at the TEXONO experiment*”, *Phys.Lett.* **B750** (2015) 459-465.
6. D.K. Papoulias and T.S. Kosmas: “*Impact of non-standard interactions on neutrino-nucleon scattering*”, *Adv.High Energy Phys.* **2016** (2016) 1490860.
7. T.S. Kosmas, D.K. Papoulias, Tórtola and J.W.F. Valle: “*Probing light sterile neutrino signatures at reactor and Spallation Neutron Source neutrino experiments*”, *Phys. Rev.* **D96** (2017) 063013.
8. D.K. Papoulias and T.S. Kosmas: “*COHERENT constraints to conventional and exotic neutrino physics*”, *Phys. Rev.* **D97** (2018) 033003.
9. D.K. Papoulias, R. Sahu, T.S. Kosmas, V.K.B. Kota and B. Nayak: “*Novel neutrino-floor and dark matter searches with deformed shell model calculations*”, *Adv.High Energy Phys.* **2018** (2018) 6031362.
10. D.K. Papoulias, T.S. Kosmas, R. Sahu, V.K.B. Kota and M. Hota: “*Constraining nuclear physics parameters with current and future COHERENT data*”, *Phys.Lett.* **B200** (2020) 135133.
11. O.G. Miranda, D.K. Papoulias, M. Tórtola, J.W.F. Valle: “*Probing neutrino transition magnetic moments with coherent elastic neutrino-nucleus scattering*”, *JHEP* **1907** (2019) 103.
12. D.K. Papoulias: “*COHERENT constraints after the COHERENT-2020 quenching factor measurement*”, *Phys.Rev.* **D102** (2020) 113004.
13. D.K. Papoulias, T.S. Kosmas and Y. Kuno: “*Recent probes of standard and non-standard neutrino physics with nuclei*”, *Front.in Phys.* **7** (2019) 191.
14. O.G. Miranda, D.K. Papoulias, M. Tórtola, J.W.F. Valle: “*Probing new neutral gauge bosons with CE ν NS and neutrino-electron scattering*”, *Phys.Rev.* **D101** (2020) 073005.
15. O.G. Miranda, D.K. Papoulias, G. Sanchez Garcia, O. Sanders, M. Tórtola, J.W.F. Valle: “*Implications of the first detection of coherent elastic neutrino-nucleus scattering (CE ν NS) with Liquid Argon*”, *JHEP* **05** (2020) 130.
16. R. Sahu, D.K. Papoulias, V.K.B. Kota, T.S. Kosmas: “*Elastic and inelastic scattering of neutrinos and WIMPs on nuclei*”, *Phys.Rev.* **C102** (2020) 035501.
17. D. Aristizabal Sierra, V. De Romeri, L.J. Flores, D.K. Papoulias: “*Light vector mediators facing XENON1T data*”, *Phys.Lett.* **B809** (2020) 135681.
18. O.G. Miranda, D.K. Papoulias, M. Tórtola, J.W.F. Valle: “*XENON1T signal from transition neutrino magnetic moments*”, *Phys.Lett.* **B808** (2020) 135685.

19. O.G. Miranda, D.K. Papoulias, O. Sanders, M. Tórtola, J.W.F. Valle: “Future CEvNS experiments as probes of lepton unitarity and light-sterile neutrinos”, *Phys.Rev.* **D102** (2020) 113014.
20. A. Karozas, S.F. King, G.K. Leontaris, D.K. Papoulias: “Low Scale String Theory Benchmarks for Hidden Photon Dark Matter Interpretations of the XENON1T Anomaly”, *Phys.Rev.* **D103** (2021) 035019.
21. D. Aristizabal Sierra, V. De Romeri, L.J. Flores, D.K. Papoulias: “Axionlike particles searches in reactor experiments”, *JHEP* **03** (2021) 294.
22. D. Aristizabal Sierra, V. De Romeri, L.J. Flores, D.K. Papoulias: “Impact of COHERENT measurements, cross section uncertainties and new interactions on the neutrino floor”, *JCAP* **01** (2022) 055.
23. O. G. Miranda, D. K. Papoulias, O. Sanders, M. Tórtola and J. W. F. Valle: “Low-energy probes of sterile neutrino transition magnetic moments”, *JHEP* **12** (2021) 191.
24. T.S. Kosmas, V.K.B. Kota, D.K. Papoulias, R. Sahu: “Coherent elastic neutrino-nucleus scattering (CEvNS) event rates for Ge, Zn, and Si detector materials”, *Phys.Rev.* **C104** (2021) 064618.
25. A. Majumdar, D.K. Papoulias, R. Srivastava: “Dark Matter Detectors as a Novel Probe for Light New Physics”, *Phys.Rev.* **D106** (2022) 1, 013001.
26. D. Aristizabal Sierra, O. G. Miranda, D.K. Papoulias, G. Sanchez Garcia: “Neutrino magnetic and electric dipole moments: From measurements to parameter space”, *Phys.Rev.* **D105** (2022) 035027.
27. D. Aristizabal Sierra, V. De Romeri, D.K. Papoulias: “Consequences of the Dresden-II reactor data for the weak mixing angle and new physics”, *JHEP* **09** (2022) 076.
28. ShivaSankar K. A., A. Majumdar, D.K. Papoulias, H. Prajapati, R. Srivastava: “Implications of first LZ and XENONnT results: A comparative study of neutrino properties and light mediators”, *Phys.Lett.B* **839** (2023) 137742.
29. A. Majumdar, D.K. Papoulias, R. Srivastava, J.W.F. Valle: “Physics implications of recent Dresden-II reactor data”, *Phys.Rev.D* **106** (2022) 9, 093010.
30. V. De Romeri, O.G. Miranda, D.K. Papoulias, G. Sanchez Garcia, M. Tórtola, J.W.F. Valle: “Physics implications of a combined analysis of COHERENT CsI and LAr data”, *JHEP* **04** (2023) 035.
31. P. Melas, D.K. Papoulias, N. Saoulidou: “Probing generalized neutrino interactions with DUNE Near Detector”, [2303.07094](https://arxiv.org/abs/2303.07094) [hep-ph]
32. P.M. Candela, V. De Romeri, D.K. Papoulias: “COHERENT production of a Dark Fermion”, [2305.03341](https://arxiv.org/abs/2305.03341) [hep-ph]

White Papers

1. M. Abdullah et al. “Coherent elastic neutrino-nucleus scattering: Terrestrial and astrophysical applications”: [arXiv: 2203.07361](https://arxiv.org/abs/2203.07361) [hep-ph]

Referee/Reviewer

- Physical Review Letters
- Physical Review D
- Journal of High Energy Physics
- Physics Letters B
- Advances in High Energy Physics
- MDPI
- SoftwareX

Scientific Associations

- Member of the Hellenic Nuclear Physics Society
- Member of the Hellenic Nuclear Physics Institute

Research Visits

- 27/04/2022 – 28/05/2022: Insituto de Fisica Corpuscular (IFIC-CSIC)/Valencia U., Valencia, Spain
- 15/10/2021 – 5/11/2021,: Insituto de Fisica Corpuscular (IFIC-CSIC)/Valencia U., Valencia, Spain
- 15/03/2018 – 16/03/2018 University College London, London, UK.

Funding

1. “3rd Call for H.F.R.I. research projects to support Post-Doctoral Researchers” (**Principle Investigator**)
2. Greek State Scholarship (IKY) for postdoctoral research 2019-2021, *Reinforcement of Postdoctoral Researchers - 2nd Cycle (MIS-5033021)*
3. Operational Programme “Human Resources Development, Education and Lifelong Learning 2014–2020” in the context of the project MIS-5047635 (**declined**)
4. PROMETEO/2018/165 Gen. Valenciana 2018-2020 (Research-Associate)
5. PROMETEOII/2014/084 Gen. Valenciana 2014-2015 (Research-Associate)

Awards & Honours

1. Greek State Scholarship (IKY) (for high performance in the Department’s examinations 2008-2009)
2. Greek State Scholarship (IKY) (prize for high performance in the Department’s examinations 2008-2009)
3. Greek State Scholarship (IKY) (as 2nd best admitted student after the Hellenic examinations 2006)