John **Gargalionis**

PhD Student · Particle Phenomenology

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Education

University of Melbourne

Melbourne, Australia

Doctor of Philosophy (Theoretical Particle Physics) — *2016 – 2019*

- Research topics: Lepton-flavour non-universality, radiative neutrino mass, machine learning and data analysis in high-energy physics
- Primary supervisor: Prof. Raymond Volkas

University of Melbourne

Melbourne, Australia

Master of Science (with Distinction) — *2014 – 2016*

- Thesis title: Neutrino mass through leptoquarks: a new radiative model and its experimental prospects
- Explored the 13 TeV reach of a radiative neutrino mass model derived from a dimension-7 lepton-number violating effective operator. The model involves two scalar leptoquarks with complementary high-energy and flavour phenomenology
- Supervisors: Prof. Raymond Volkas and Prof. Elisabetta Barberio
- Average mark (including coursework): 87%

Bachelor of Science

- Average mark: 80%
- Specialisations: Physics, Neuroscience, Ancient Languages

Publications

First-author publications:

Reconsidering the One Leptoquark solution: flavour anomalies and neutrino mass — *2017*

Yi Cai, John Gargalionis, Michael A. Schmidt & Raymond R. Volkas — *JHEP*

`arXiv:1704.05849`

Second-author publications:

Explaining the 750 GeV diphoton excess with a coloured scalar charged under a new confining gauge interaction — *2016*

Robert Foot & John Gargalionis — *PRD*

`arXiv:1604.06180`

Seminars & Conference Talks

May 2018	**Monash University**, Radiative neutrino mass and the flavour anomalies: a circumstantial case	*Melbourne, Australia*
Sep 2017	**Geoff Opat Seminar Series**, Radiative neutrino mass and the flavour anomalies: a circumstantial case	*Melbourne, Australia*
Aug 2017	**Technische Universität Dortmund**, Radiative neutrino mass and the flavour anomalies: a circumstantial case	*Dortmund, Germany*
Aug 2017	**Technische Universität München**, Radiative neutrino mass and the flavour anomalies: a circumstantial case	*Garching, Germany*
May 2017	**Instant workshop on B-meson anomalies**, Reconsidering the 'one leptoquark' solution: flavour anomalies and neutrino mass	*CERN, Switzerland*
Dec 2016	**APPC-AIP Congress**, Reconsidering the 'one leptoquark' solution: flavour anomalies and neutrino mass	*Brisbane, Australia*
Jun 2016	**University of Melbourne**, Light leptoquarks at the LHC: neutrino mass and flavour physics	*Melbourne, Australia*
Nov 2015	**MSc completion seminar**, Radiative neutrino mass through leptoquarks	*Melbourne, Australia*

Training

Summer schools

Aug 2017	**Joint Challenges for Cosmology and Colliders,** MITP	*Mainz, Germany*
Jul 2017	**EFT in Particle Physics and Cosmology,** Ecole de Physique des Houches	*Les Houches, France*
Jul 2016	**Pre-SUSY School,** University of Melbourne	*Melbourne, Australia*

Summer research projects

Dark matter and heavy-flavoured quarks *Melbourne, Australia*

ATLAS EXOTICS GROUP *Jan 2016*

- Supervisor: Dr. Francesca UNGARO
- Suggested a new b-tag working point that was used in the DM + b-jet analysis
- Explored the potential of various kinematic variables to improve the reach of the search

Honors & Awards

2016 – 2019	**Australian Postgraduate Award (APA),** Australian Research Council	*Melbourne, Australia*
2015	**Prof. Kernot Research Scholarship in Physics,** University of Melbourne	*Melbourne, Austria*
2014	**N. D. Goldsworthy Scholarship,** University of Melbourne	*Melbourne, Austria*

Teaching

2018	**Teaching Assistant,** 3rd year Subatomic Physics	*University of Melbourne*
2018	**Tutor,** 1st year Physics	*University of Melbourne*
2018	**Grader,** 3rd year Quantum Mechanics	*University of Melbourne*
2018	**Tutor,** Advanced Scientific Programming in Python (Asia–Pacific)	*Melbourne Bioinformatics*
2017, 2018	**Laboratory Demonstrator,** 3rd year Particle Lab	*University of Melbourne*
2016, 2017	**Tutor,** 2nd year Computational Physics	*University of Melbourne*
2016	**Teaching Assistant,** 3rd year Subatomic Physics	*University of Melbourne*
2014 – 2016	**Language Teacher,** Modern and Ancient Greek	*Centre for Adult Education*
2014, 2015	**Laboratory Demonstrator,** 1st year Physics Lab	*University of Melbourne*
2010 –	**Private Tutor,** Physics, Mathematics, Greek	

Scientific Outreach

2017	**Physics Workshops,** Project coordinator	*Hume Central Secondary*
2015, 2016	**International Masterclass in Particle Physics**	*South Oakleigh Grammar*
2015	**CoEPP Work Experience Program,** Organising committee	*University of Melbourne*
2015	**International Masterclass in Particle Physics**	*University of Melbourne*

Skills

Programming	Python 2/3, Mathematica, C/C++, Clojure, TEX
Data analysis	ROOT, Pandas, SQLite
Collider	CMSSW, MadGraph, Pythia, Fastjet, Delphes
Machine learning	Tensorflow, Keras, Scikit-learn, XDGBoost
Calculation	Sympy, Package-X, FeynRules, FeynArts, FormCalc
Visualisation	Matplotlib, pgf-plots, TikZ, gnu-plot
Management	Git, Cluster computing

Other

Citizenship	Australian
Birth year	1991 (27 years old)
Languages	English (native), Greek (fluent)