# John Gargalionis

#### PHD STUDENT · PARTICLE PHENOMENOLOGY

CoEPP, University of Melbourne, Parkville, AUS

garj@student.unimelb.edu.au | @johngarg.github.io

## **Education**

University of Melbourne Melbourne

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 Melbourne

MASTER OF SCIENCE (WITH DISTINCTION)

2014 - 2016

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- 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	2016
GAUGE INTERACTION	2010
Robert Foot & John Gargalionis	PRD
arXiv:1604.06180	

## Seminars & Conference Talks \_\_\_\_\_

Oct 2018	Belle II Theory Interface Platform, Leptoquarks and flavour	KEK, Japan
May 2018	Monash University, Radiative neutrino mass and the flavour anomalies: a circumstantial case	Melbourne, Australia
		Weibourne, Australia
Sep 2017	Geoff Opat Seminar Series, Radiative neutrino mass and the flavour anomalies: a	Melbourne, Australia
	circumstantial case	Melbourne, Australia
Aug 2017	<b>Technische Universität Dortmund</b> , Radiative neutrino mass and the flavour anomalies: a	Dortmund, Germany
	circumstantial case	Dorumana, Germany
Aug 2017	<b>Technische Universität München</b> , Radiative neutrino mass and the flavour anomalies: a	Carchina Cormany
	mstantial case	Garching, Germany
May 2017	<b>Instant workshop on B-meson anomalies</b> , Reconsidering the 'one leptoquark' solution:	CEDAL Cuitzarland
	flavour anomalies and neutrino mass	CERN, Switzerland
Dec 2016	APPC-AIP Congress, Reconsidering the 'one leptoquark' solution: flavour anomalies and	Duiele eur e Avertuelle
	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 2017Joint Challenges for Cosmology and Colliders, MITPMainz, GermanyJul 2017EFT in Particle Physics and Cosmology, Ecole de Physique des HouchesLes Houches, FranceJul 2016Pre-SUSY School, University of MelbourneMelbourne, Australia

### Summer research projects

#### Dark matter and heavy-flavoured quarks

ATLAS EXOTICS GROUP

- 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

Melbourne, Australia Jan 2016

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#### Honors & Awards

2018	Science Abroad Travel Scholarship, University of Melbourne	Melbourne, Australia
2016 – 2019	Australian Postgraduate Award (APA), Australian Research Council	Melbourne, Australia
2015	<b>Prof. Kernot Research Scholarship in Physics</b> , University of Melbourne	Melbourne, Austria
2014	N. D. Goldsworthy Scholarship, University of Melbourne	Melbourne, Austria

## Teaching\_

2018	<b>Teaching Assistant</b> , 3rd year Subatomic Physics	University of Melbourne
2018	<b>Tutor</b> , 1st year Physics	University of Melbourne
2018	<b>Grader</b> , 3rd year Quantum Mechanics	University of Melbourne
2018	<b>Tutor</b> , Advanced Scientific Programming in Python (Asia–Pacific)	Melbourne Bioinformatics
2017, 2018	Laboratory Demonstrator, 3rd year Particle Lab	University of Melbourne
2016, 2017	<b>Tutor</b> , 2nd year Computational Physics	University of Melbourne
2016	<b>Teaching Assistant</b> , 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 -	<b>Private Tutor</b> , Physics, Mathematics, Greek	

## Scientific Outreach \_\_\_\_\_

2018	<b>CoEPP Work Experience Program</b> , Introductory talk: The Standard Model	University of Melbourne
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, T<sub>E</sub>X

**Data analysis** ROOT, Pandas, SQLite

ColliderCMSSW, MadGraph, Pythia, Fastjet, DelphesMachine learningTensorflow, Keras, Scikit-learn, XGBoost

**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)