

# John Gargalionis

PARTICLE PHENOMENOLOGIST

University of Melbourne, Parkville, AUS

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## Employment

### University of Melbourne

Melbourne, Australia

RESEARCH ASSOCIATE

2021

- Developing novel techniques for quark–gluon discrimination using unsupervised machine learning and the CMS Open Data
- Extending doctoral work on connection between flavour anomalies and neutrino masses

## Education

### University of Melbourne

Melbourne, Australia

DOCTOR OF PHILOSOPHY (THEORETICAL PARTICLE PHYSICS)

2016 — 2020

- Thesis title:* Models of radiative neutrino mass and lepton flavour non-universality
- Supervisor:* Prof. Raymond VOLKAS

MASTER OF SCIENCE (WITH DISTINCTION)

2014 — 2016

- Thesis title:* Neutrino mass through leptoquarks: a new radiative model and its experimental prospects
- Supervisors:* Prof. Raymond VOLKAS and Prof. Elisabetta BARBERIO

BACHELOR OF SCIENCE

2010 — 2014

- Specialisations:* Physics, Neuroscience, Ancient Languages

## Publications

### Research publications

EXPLODING OPERATORS FOR MAJORANA NEUTRINO MASSES

2020

John Gargalionis & Raymond R. Volkas

JHEP

arXiv:2009.13537, JHEP 10:074 (2021)

RADIATIVE NEUTRINO MASS MODEL FROM A MASS DIMENSION 11  $\Delta L = 2$  EFFECTIVE OPERATOR

2019

John Gargalionis, Iulia Popa-Mateiu & Raymond R. Volkas

JHEP

arXiv:1912.12386, JHEP 10:150 (2020)

A NEAR-MINIMAL LEPTOQUARK MODEL FOR RECONCILING FLAVOUR ANOMALIES AND GENERATING RADIATIVE NEUTRINO MASS

2019

Innes Bigaran, John Gargalionis & Raymond R. Volkas

JHEP

arXiv:1906.01870, JHEP 10:106 (2019)

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, JHEP 10:047 (2017)

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, Phys. Rev. D94:011703 (2016)

## Other publications

SOLUTIONS TO PROBLEMS AT LES HOUCHES SUMMER SCHOOL ON EFT

2020

Marcel Balsiger, Marios Bounakis, Medhi Drissi, John Gargalionis, Erik Gustafson, Greg Jackson, Matthew Leak, Christopher Lepenik, Scott Melville, Daniel Moreno, Michele Tommaro, Selim Touati & Timothy Trott

Oxford University Press  
(included in publication of  
lecture notes)

arXiv:2005.08573

## Invited Seminars

Oct 2018	<b>Belle II Theory Interface Platform</b> , Leptoquarks and flavour	KEK, Japan
May 2018	<b>Monash University</b> , Radiative neutrino mass and the flavour anomalies: a circumstantial case	Melbourne, Australia
May 2017	<b>Instant workshop on B-meson anomalies</b> , Reconsidering the ‘one leptoquark’ solution: flavour anomalies and neutrino mass, <a href="https://cds.cern.ch/record/2265323">https://cds.cern.ch/record/2265323</a>	CERN, Switzerland

## Contributed Seminars

Sep 2017	<b>Geoff Opat Seminar Series</b> , Radiative neutrino mass and the flavour anomalies: a circumstantial case	Melbourne, Australia
Aug 2017	<b>Technische Universität Dortmund</b> , Radiative neutrino mass and the flavour anomalies: a circumstantial case	Dortmund, Germany
Aug 2017	<b>Technische Universität München</b> , Radiative neutrino mass and the flavour anomalies: a circumstantial case	Garching, Germany
Dec 2016	<b>APPC-AIP Congress</b> , Reconsidering the ‘one leptoquark’ solution: flavour anomalies and neutrino mass	Brisbane, Australia
Jun 2016	<b>University of Melbourne</b> , Light leptoquarks at the LHC: neutrino mass and flavour physics	Melbourne, Australia
Nov 2015	<b>MSc completion seminar</b> , Radiative neutrino mass through leptoquarks	Melbourne, Australia

## Training

### Summer schools

Aug 2017	<b>Joint Challenges for Cosmology and Colliders</b> , MITP	Mainz, Germany
Jul 2017	<b>EFT in Particle Physics and Cosmology</b> , Ecole de Physique des Houches	Les Houches, France
Jul 2016	<b>Pre-SUSY School</b> , 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

## Honours & Awards

2018	<b>Science Abroad Travel Scholarship</b> , University of Melbourne	Melbourne, Australia
2017	<b>Research poster award</b> , CoEPP	Adelaide, Australia
2016 – 2019	<b>Australian Postgraduate Award (APA)</b> , Australian Research Council	Melbourne, Australia
2015	<b>Prof. Kernot Research Scholarship in Physics</b> , University of Melbourne	Melbourne, Austria
2014	<b>N. D. Goldsworthy Scholarship</b> , University of Melbourne	Melbourne, Austria

## Teaching

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2020, 2021	<b>Teaching assistant</b> , Quantum Field Theory	University of Melbourne
2020	<b>High School Teacher</b> , VCE Modern Greek	Victorian School of Languages
2018	<b>Tutor</b> , 1st year Physics	University of Melbourne
2018, 2019	<b>Tutor</b> , 3rd year Quantum Mechanics	University of Melbourne
2018	<b>Tutor</b> , Advanced Scientific Programming in Python (Asia-Pacific)	Melbourne Bioinformatics
2016 – 2019	<b>Teaching assistant and course content creator</b> , 3rd year Subatomic Physics	University of Melbourne
2014 – 2016	<b>Curriculum designer and language teacher</b> , Modern and Ancient Greek	Centre for Adult Education
2014 – 2018	<b>Laboratory demonstrator</b> , 1st year Physics Lab, 3rd year Particle Lab, 2nd year Computational Physics	University of Melbourne
2010 – 2019	<b>Private Tutor</b> , Physics, Mathematics, Greek	

## Scientific Outreach

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2018, 2019	<b>CoEPP Work Experience Program</b> , Introductory talk: The Standard Model	University of Melbourne
2017	<b>Physics Workshops</b> , Project coordinator	Hume Central Secondary
2016	<b>Undergraduate Seminar Series</b> , Research talk targeted at undergraduate physics students	University of Melbourne
2015, 2016	<b>International Masterclass in Particle Physics</b>	South Oakleigh Grammar
2015	<b>CoEPP Work Experience Program</b> , Organising committee	University of Melbourne
2015	<b>International Masterclass in Particle Physics</b>	University of Melbourne

## References

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### Prof. Raymond Volkas

University of Melbourne

DOCTORAL ADVISOR

raymondv@unimelb.edu.au

### A/Prof. Matthew Dolan

University of Melbourne

COLLABORATOR

matthew.dolan@unimelb.edu.au

### Dr. Michael Schmidt

University of New South Wales

COLLABORATOR

m.schmidt@unsw.edu.au

## Other

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<b>Citizenship</b>	Australian
<b>Birth year</b>	1991
<b>Languages</b>	English (native), Greek (fluent)