

# LARA MASON

## CURRICULUM VITAE

Date of birth: 18 October 1992. Age: 27

Nationality: South African

Languages: English, French, Afrikaans, Portuguese

Email: masonlara316@gmail.com

### EDUCATION/TRAINING

#### **Tertiary Education**

2019 to present	<b>Université Claude Bernard Lyon 1, France and University of Johannesburg, South Africa</b> PhD in High Energy Particle Physics (co-tutelle)
2017-2018	<b>University of the Witwatersrand, South Africa</b> MSc in Medical Physics
2016-2017	<b>University of Melbourne, Australia (with the ATLAS project at CERN, Geneva)</b> MPhil in High Energy Particle Physics with Distinction (First Class)
2011-2015	<b>University of Cape Town, South Africa</b> BSc(Hons) in Physics with Distinction (First Class) BSc in Mathematics, Physics and Business French

#### **Secondary Education**

1999 - 2010	<b>St Cyprians School, Cape Town, South Africa</b>
2010	Top student in Western Province, South Africa, for English (FL NSC)

#### **Awards/Achievements**

2019	SAIP Annual Conference: PhD prize (theory division)
2017	ATLAS, CERN: ATLAS authorship
2011/13/14	UCT, South Africa: Dean's List for Science Faculty

#### **Additional training**

2019	Vinyasa Yoga 200 hour teacher certification
2018	Caple, Lisbon: Portuguese Ciple A2
2014	CCI Paris Île-de-France: Diplôme de Français Professionnel B2

### RESEARCH

#### **Topics**

2019 to date	<b>High energy physics:</b> Phenomenology of the scalar sector beyond the Standard Model.
2018	<b>Medical physics:</b> Geant4 Monte Carlo simulation of brachytherapy treatment planning.
2016/2017	<b>High energy physics:</b> work done with the Tau Trigger Group at ATLAS, CERN. Responsible for the calculation of trigger efficiencies.
2015	<b>High energy physics:</b> research on the $\mu\mu$ spectrum using data gathered at ATLAS, CERN.

#### **Output**

2020	• A.S. Cornell, A. Deandrea, B. Fuks, L. Mason, <i>Future lepton collider prospects for a ubiquitous composite pseudo-scalar</i> (DOI: 10.1103/PhysRevD.102.035030; arXiv:2004.09825), accepted 11 August 2020
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- 2019 • L. Mason, A.S. Cornell, A. Deandrea, B. Fuks, *Bottom-quark contributions to composite pseudo-scalar couplings at LHC*, Frascati Physics Series ISBN: 9788886409711, 2019, Vol 70, 110-115
- L. Mason, A.S. Cornell, A. Deandrea, B. Fuks, *The ubiquitous pseudo-scalar in composite Higgs models* (proceedings: South African Institute of Physics 2019 ISBN: 978-0-620-88875-2)
- 2017 • The ATLAS collaboration (co-author): *The ATLAS Tau Trigger in Run 2*, ATLAS CONF note (ATLAS-CONF-2017-061)

### **Presentations**

- 2020 • UJ departmental seminar (virtual)  
*"Future collider prospects (with machine learning) for a composite pseudo-scalar"*
- FCC-ee committee physics meeting (virtual)  
*presentation of recent work "Future lepton collider prospects for a ubiquitous composite pseudo-scalar"*
- High Energy Particle Physics Workshop, Thoyandou, South Africa  
*"Future collider prospects for a ubiquitous composite pseudo-scalar"*
- 2019 • LFC19: Strong dynamics for physics within and beyond the Standard Model at LHC and Future Colliders Workshop, Trento, Italy  
*"A ubiquitous pseudo-scalar in composite Higgs models"*
- South African Institute of Physics Annual Conference, Polokwane  
*"A ubiquitous pseudo-scalar in composite Higgs models"*

### **Funding**

- 2020/2021 **French Ministry for Europe and Foreign Affairs**  
 Eiffel Excellence Scholarship Programme/ Bourse d'Excellence Eiffel
- Nov/Dec 2019 **Campus France**  
 PhD Scholarship
- 2019 to present **University of Johannesburg**  
 NRF PhD scholarship (2019), UJ GES 4.0 award
- 2016 to 2017 **University of Melbourne**  
 Melbourne Research Full Scholarship
- 2015 **University of Cape Town**  
 Applied/Experimental Physics Department Bursary, UCT Merit Award and NRF Scarce Skills Bursary

## **PROFESSIONAL DEVELOPMENT**

### **Schools and workshops**

- 2020 **Sixth Machine Learning in High Energy Physics Summer School 2020:**  
 Theory and application of machine learning for HEP using PYTHON.
- 2019 **Fundamental Composite Dynamics:** Mainz Institute for Theoretical Physics.  
 Collaborative workshop on composite Higgs studies and related fields.
- 2018 **SA-CERN summer school:** Centre of theoretical and mathematical physics,  
 University of Cape Town. Lectures on QFT, SM physics, and heavy ion/QGP physics.  
**56th SAAPMB Conference (medical physics):** Pretoria.
- 2017 **NMISA 70/10 (medical physics):** Metrology conference, Pretoria.  
 Lectures on QFT, SM physics, and heavy ion/QGP physics.

2016 **International conference on SuperSymmetry:** University of Melbourne.

## **PROGRAMMING SKILLS**

Proficient in LATEX, PYTHON, C++, MATHEMATICA, FEYNRULES, MADGRAPH, and GEANT4

## **WORK EXPERIENCE**

### **Physics-Related Experience**

2020 **University of Johannesburg:** Second year physics class tutor  
 2019 **SAIP theory division:** Committee student representative  
 2019 **Université de Lyon-1, France:** Research collaboration visit  
 2019 **University of the Witwatersrand:** First year physics class tutor  
 2015 **University of Cape Town Physics Dept:** First year laboratory demonstrator  
 2015 **CERN, Geneva:** Work-shadow at ATLAS week  
 2011 **IThemba LABS, South Africa:** Work experience on PET

### **Private Tutoring Experience**

2019 to date **Private clients, Johannesburg, South Africa**  
 2017-2018 **Tutroom, Johannesburg:** Management team/ Head of Curriculum/ Tutor  
 2017 **BrightSparkz Tutoring, Johannesburg:** University level Maths/Chemistry tutor  
 2016 **Private client, Paris, France:** Au pair/tutor  
 2012-2013 **Sigma Tutoring, Cape Town:** University-Level Mathematics tutoring  
 2011-2015 **Private client, Cape Town:** Long term tutoring position

### **Corporate Experience**

2013 **PPMAmerica, Chicago:** Internship in fixed income management  
 2012 **Riscura Analytics, Cape Town:** Internship in risk assessment

### **Yoga Teaching Experience**

2019 **Private Classes, Johannesburg:** Vinyasa-based group classes  
 2020 **Private Classes, Online:** Vinyasa-based group classes

## **OUTREACH**

2020 **Women in Physics in South Africa (WiPSA): annual outreach program:** video contribution  
 2019 **Independent outreach:** Women in physics talk at Jeppe Girl's School, Johannesburg  
 2015 **Independent outreach:** Women in physics talk at St Cyprian's School, Cape Town  
 2011-2015 **SHAWCO Education Project- Cape Town**  
 2009 **Round Square International Service Project - Kenya**  
 2009 **Round Square Conference - India**  
 International student project, including service in local communities  
 2008-2012 **Llandudno Surf Lifeguards, Cape Town**  
 Lifeguard and assistant in coaching unqualified lifeguards.  
 2006-2008 **Girl Child in Africa Project**