Matthew Rossetter
Curriculum Vitae

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MASTERS THESIS

"CP Violation In And Beyond The Standard Model"

In the preliminary report, we test the Two Higgs Doublet Model (2HDM) of Type II as an extension of the Standard Model (SM) using indicative flavour observables, with particular focus on leptonic decays of B and D mesons, $B\bar{B}$ mixing, and the $b \rightarrow s\gamma$ radiative decay. Testing the 2HDM parameter space m_{H+}, $\tan\beta$ to find alignment between theoretical calculations and experiment, constraints on the parameters were found for the above flavour phenomena both individually and then as a global fit. Strongly dominated by the $b \rightarrow s\gamma$ branching ratio, the mass of a charged Higgs particle would be expected to lie between 370 GeV and 891 GeV. The 2HDM vacuum expectation value ratio $\tan\beta$ is calculated to lie between 2.16 and 33.0. Discussions on the goals of the study from here are ongoing, likely a further study into the 2HDM and its validity as a SM extension.

EDUCATION

2016 – PRESENT	**Master of Physics**

STATEMENT OF MARKS:
- THIRD YEAR - 2:1 (69%)
- SECOND YEAR - 1ST (77%)
- FIRST YEAR - 1ST (72%)

Theoretical Physics
University of Durham

2009 – 2016	**Secondary Education**

- Advanced Highers - A in Physics, Maths, Chemistry, and English
- Highers - A in Physics, Chemistry, Biology, Maths, and English
- National 5s - 7 As and 1 C including Maths, Physics, and English at A

The High School of Glasgow

ACADEMIC EXPERIENCES

Quarkonia Modelling

Throughout my degree course, I have had several courseworks that have required extensive Python programming, thus far leading up to the year-long project in my Third Year, where I modelled the early (n,l) wave-functions for a Hydrogen atom, and then applied this to Quarkonia phenomena. I was able to calculate good approximations for several lower state masses, with the inclusion of hyperfine splitting. A full repository of this study can be found in my github profile.

Python Tutoring

As part of my fourth year, I have volunteered to help as a tutor in First Year programming workshops, assisting in teaching the new students the fundamentals of Python programming for physics. I put my knowledge of Python to good use in sharing it with newer students, and this has allowed me to gain a better understanding of the language in teaching it.

AWARDS

2019	President's Vote of Thanks, and Full Colours *St Mary's College, Durham University*
2018	BIIAB Level 2 Award for Personal License Holders
2017	RLSS National Pool Lifeguard Qualification
2016	British Red Cross Emergency First Aid and ITC Outdoor First Aid
2015,16	National Finalist and Company President at UK Space Design Competition
2014,15	CREST Bronze & Silver Science Awards

COMPUTER SKILLS

BEGINNER	Perl, HTML, Fortran
INTERMEDIATE	C++, Microsoft Office
EXPERT	Python, Unix, LaTeX

SKILLS

Goal Oriented

Understanding tasks properly is important to me. Performing these tasks properly is important to the efficient running of a workspace. I listen to all viewpoints and use my judgement to act and achieve goals quickly and efficiently.

Dedicated

I believe in performing all tasks to the best of my ability. As part of any workplace, I dedicate myself fully to the task at hand. Focusing on what task needs done and always putting the full effort needed towards its completion results in a better job being performed, likely taking less time and resources while being of higher quality.

Passionate

I have been interested in theoretical physics such as quantum mechanics and particle phenomenology from an early age. My education and research have cemented this interest into a passion. I greatly enjoy carrying out fundamental physics research with potential experimental implications.

Friendly and Sociable

I have spent a lot of time working in customer service and enjoy interacting with people of all backgrounds. I have learned how to deal with many possibly difficult situations and understand how to defuse tense scenarios.

Manual Handling

I have recieved manual handling training from several of my previous employers and am comfortable performing tasks that require this. I am comfortable switching from more inactive jobs and tasks to highly active ones.

WORK EXPERIENCE

<div align="right">CURRENT, FROM OCT 2018 (PT)</div>

Freemans Quay Leisure Centre
Casual Leisure Assistant/Lifeguard

The challenge of being a lifeguard is in the potential for life-or-death situations. As a lifeguard, I present a positive leisure experience, which focuses on dealing with any customer issues and maintaining an enjoyable environment for all. This must be balanced with constant vigilance over the pool area in case of the need for intervention or rescue, with the proper knowledge and ability to save any lives that may be at risk.

<div align="right">CURRENT, FROM OCT 2017 (PT)</div>

St Mary's College Bar
Bar Staff

I am responsible for serving and interacting with customers. This requires developing keen social skills to balance a friendly atmosphere for customers with a presence of authority to those who may cause trouble. It is important to maintain a high level of cleanliness in a frequently messy environment, and keep a mind for potential welfare issues such as binge drinking which must be monitored and reported.

<div align="right">SEP 2018 – JULY 2019 (PT)</div>

St Mary's College Bar
Bar Steward

Over the academic year 18/19, I was in charge of the college bar with duties such as stock control, staff hiring and training, shift assignment, and maintainence and cleaning. I was selected for my strong work ethic and commitment to the role, and developed skills into this management role to improve the college bar to bring in more customers, creating a safer and more efficient working environment for staff. When managing staff who were also my peers, it was important to find the proper balance in the workplace so I would be taken seriously in my role as their manager.

REFERENCES

Dr. Alexander Lenz

POSITION	Professor
EMPLOYER	*Institute for Particle Physics Phenomenology* *University of Durham*
EMAIL	alexander.lenz@durham.ac.uk
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Dr. Qing (Helen) He

POSITION	Assistant Professor
EMPLOYER	*Centre for Materials Physics* *University of Durham*
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Mustafa Gun

POSITION	Food and Beverages Services Manager
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