

# Curriculum vitae

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**Full name:** Virinchi Venkata Rallabhandi

**Nationality:** Australian

**Current study:** PhD in Mathematical Physics at the University of Edinburgh (2022-), supervised by James Lucietti

## Completed qualifications:

- Master of Advanced Study in Applied Mathematics from the University of Cambridge (i.e. Part III of the Mathematics Tripos), completed with merit and a final score of 74% (2021 - 2022)
- Master of Physics (theoretical physics stream) from the University of Western Australia (UWA), completed with distinction and a Weighted Average Mark (WAM) of 95.67% (2020 - 2021)
- Bachelor of Science (Physics, Mathematics & statistics) from UWA with a WAM of 94.58% (2017 - 2019). This degree also included a short summer program undertaken at the University of California, Los Angeles (UCLA).

## Academic achievements:

- Equal 9th (3rd in Australia) in the pairs division (with Alexander Rohl) of the 2017 *Simon Marais Mathematics Competition* (an Asia-Pacific wide undergraduate maths competition modelled on the Putnam competition)
- Came 3rd, 1st and 3rd respectively in the 2017, 2018 and 2019 *Blakers Mathematics Competition* (a Western Australia wide undergraduate maths competition)
- Winner of the 2021 Muriel and Colin Ramm Prize and Medal (for the highest scoring student in the Master of Physics at UWA)
- Joint winner (with Jesse Schelfhout) of the 2019 *John de Laeter Medal* (for the highest scoring 3rd year undergraduate physics student at a Western Australian university)
- Winner of the 2019 *Ken Freeman Prize in Astrophysics and Space Science* (for highest score in the unit, PHYS3003, at UWA)
- Winner of the 2019 *Lance Maschmedt Physics Prize* (for highest average score across the units PHYS3001 (“*Quantum mechanics and atomic physics*”), PHYS3002 (“*Electrodynamics and relativity*”), PHYS3011 (“*Mathematical Physics*”) and PHYS3012 (“*Frontiers in Modern Physics*”) at UWA)

- Highest score in each of the units, MATH3031 (“*Algebraic structures and symmetry*”) and MATH3022 (“*Scientific and industrial modelling*”), at UWA in 2019
- Winner of the 2017 *Lady James Prize in Science* (for the highest score across the 1st year physics or chemistry units at UWA)
- Bronze in the 2016 *Australian Mathematics Olympiad* (an Australia wide invitational maths competition for secondary school students). While this is “only” a school competition, when considering its difficulty - at least in a secondary school context - I consider my bronze here to be a greater achievement than any of the others in this list.

### **Academic experience:**

- My PhD studies focus broadly on mathematical topics in general relativity. My work so far has been concentrated on the theme of positive energy theorems and their application to uniqueness theorems for static black holes.
- My Cambridge master’s program was entirely composed of coursework. I sat exams in general relativity, quantum field theory, differential geometry, black holes, advanced quantum field theory and string theory. Although I didn’t sit exams in them, the courses I took also included symmetries, particles & fields, algebraic topology and supersymmetry.
- My UWA master’s program was evenly split between coursework and research. My final thesis was titled “*Higher symmetries of relativistic wave equations in curved spacetime.*” While the physical interest for studying this mathematical problem came from the parallels between the algebra of higher symmetries and higher spin algebras, my thesis was primarily concerned with the techniques of differential geometry and differential equations used to solve the problem at hand. My thesis particularly emphasized spinor methods in computing higher symmetries.
- During the 2018/2019 summer holidays, I was one of eight students selected to participate in a ten week research internship at the International Centre for Radio Astronomy Research (ICRAR) - a collaboration between physics departments at UWA and Curtin University.
- In semester 1 of 2018, I did a research placement performing numerical simulations at the UWA node of the Australian Research Council’s Centre of Excellence for Gravitational Wave Discovery, “OzGrav.”

### **Employment:**

- During my PhD, I have been employed by the University of Edinburgh as a tutor (or in American terminology, a teaching assistant) for the 2nd and 3rd year undergraduate courses, “fundamentals of pure mathematics” and “honours analysis.”
- Between March 2020 and June 2021, I was employed by UWA to work as tutor for the first year maths unit, MATH1012, covering linear algebra, series & sequences (including Taylor series), Laplace transforms and statistics.
- I was employed as a tutor for the 2021 Western Australian Mathematics Summer School (WAMSS). WAMSS is a week long residential school for promising final year secondary school students, aiming to introduce them to interesting areas of maths - e.g. number theory - which they wouldn’t otherwise be able to access at school.

**Funding:**

- School of Mathematics Studentship - for my PhD at Edinburgh
- Part III International Scholarship - for my master's at Cambridge
- Muriel and Colin Ramm Postgraduate Scholarship in Physics - for my master's at UWA

**Miscellaneous:**

- Member of the Australian Labor Party
- Member of the Australian Republic Movement
- Life member of the Cambridge Union Society
- Long time tuba player