Thomas Brosnan

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Education

University of Cambridge 2025 – Present
MASt in Theoretical Physics, Part III of the Mathematical Tripos

Trinity College Dublin 2021 – 2025
BA (Hon) In Theoretical Physics. Graduated with a First Class Honours (86%).

St Colmcille's Secondary School - Dublin 2015-2021
Leaving certificate, 613 points, H1's in Physics, Maths, Applied Maths, DCG, Chemistry

Research Experience

QFT on Causal Sets July - August 2025
Dublin Institute for Advanced Studies (DIAS) - School of Theoretical Physics

- In the summer of 2025 I undertook a research project with Dr Yasaman Yazdi at DIAS.
- Investigated quantum fields on causal sets in different spacetimes such as de Sitter, simulating causal set propagators, to compare to continuum curves. This is part of the overall goal of showing QFT on causal sets produces the same results as the continuum limit.
- In the process of writing a paper on the results.

QFT near Schwarzchild de Sitter Black Holes September 2024 - May 2025
Trinity College Dublin - School of Mathematics

- My Final Year Project under the supervision of Prof. Manuela Kulaxizi involved the exploring aspects of QFT in curved spacetimes, such as the Unruh affect and Hawking Radiation.
- Subsequently used these ideas to analyse Raphael Bousso and Stephen Hawking's "(Anti-)Evaporation of Schwarzschild -de Sitter Black Holes". Find my thesis here.

Testing Single-Pulse-Search Algorithms June - August 2024
University of California, Berkeley/Irish I-LOFAR Observatory

- Conducted research as part of Breakthrough Listen's Search for Extraterrestrial Intelligence, supervised by Professor Evan Keane.
- Developed a pipeline for evaluating the efficiency of single pulse detection algorithms.

Testing Theories of Gravity with Pulsars May - July 2023
Trinity College Dublin - School of Mathematics

- Completed a research project as part of the Hamilton Trust Internship under the supervision of Professor Evan Keane. Tested theories of gravity using Pulsars. My work can be found here.

Work Experience

Teaching Assistant 2023 - 2025
Trinity College Dublin - School of Mathematics

- Graded and gave tutorials for first year module "Techniques in Theoretical Physics". Currently grading second year module: "Advanced Classical Mechanics"

Applied Maths Teacher 2021-2024
St Colmcille's Secondary school - Dublin

- Actively teaching 5th and 6th year classes of around 15 students

Coding Instructor 2021 - 2022
Olus Education - Dublin

- Involved teaching classes in Java, Python and HTML

Awards & Honors

Gold Medal 2025
Trinity College Dublin-Achieved prize for achieving a grade above 80% across my whole degree.

Arthur Lyster Prize 2021
Trinity College Dublin -Achieved prize for Junior Fresh mathematics results

Trinity Entrance Award 2021
Trinity College Dublin-Achieved prize on the basis Leaving certificate results

Specialized Skills

Programming Languages: Java, Python, Shell scripting (Bash, csh, ect), C++. Git

Linux: Experience with large data management on Linux servers. Currently maintaining home Linux server on a Raspberry pi 5.

I-LOFAR Telescope: Experience creating observing scheduals for the Irish I-LOFAR radio telescope.

LaTeX: I have written detailed notes, lab reports and papers all in LaTex. I gave an "Introduction to LaTex" seminar for the TPSA in October 2024.

Other Interests

Treasurer of the Theoretical Physics Student Association (TPSA): As treasurer I developed and managed budgets to support ongoing activities while identifying and securing new funding sources to sustain and expand operations.

Captain of the PLANCKS Team: I was captain of the team that represented Trinity at the UK & Ireland preliminary and subsequently Ireland at the international final in 2024. PLANCKS is a exam-based physics competition for bachelor's and master's students.

Communication: I am passionate about communicating and sharing my work with others.

- Recently (December 2025) as part of the part III seminar series, I gave a seminar about "Dynamical Dark Energy from Causal Set Theory" to my fellow student. The slides of which can be found here.
- During the Summer of 2025 I created a 6 part lecture series Introducing General Relativity aimed at new students, that is now on the TPSA's YouTube channel.
- I am also an admirer of the open source philosophy, hence any code I have developed is available on my GitHub page and any notes I have typed up are hosted on my website.

Miscellaneous: In my free time I compete for St John's college Cambridge basketball team. I also read recreationally particularly works of Sci-Fi and Fantasy.

References

- Professor Evan Keane: evan.keane@tcd.ie
- Professor Chaolun Wu wuch@tcd.ie
- Professor Manuela Kulaxizi kulaxizm@tcd.ie