Thomas Brosnan

tbrosnan@tcd.ie
0871095522

Education

Trinity College Dublin 2021 – Present

BA (Hon) In Theoretical Physics, Senior Sophister student. Expected grade: I-I.

St Colmcille's Secondary School - Dublin 2015-2021

Leaving certificate, 613 points, H1's in Physics, Maths, Applied Maths, DCG, Chemistry

Research Experience

Fourth Year Capstone Project 2024 September - Present

Trinity College Dublin - School of Mathematics

- Undertaking a research project under the supervision of Manuela Kulaxizi on "Quantum Field Theory in deSitter spacetime"

Breakthrough Listen Internship 2024 June - August

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.
- Coordinated dual site observations of exoplanets and pulsars using Irish and Swedish I-LOFAR radio telescopes.
- Invited to present findings at Breakthrough Discuss 2024, University of Oxford.
- Currently writing a paper titled "On the Response of Single Pulse Search Algorithms" to document the research results.

Hamilton Trust Internship 2023 May - July

Trinity College Dublin - School of Mathematics

- Completed a research project under the supervision of Professor Evan Keane
- Title - Testing theories of gravity using Pulsars
- Developed code to generate mass-mass diagrams for pulsar binaries. Derived equations for mass-mass diagrams for alternate theories of gravity
- Link to GitHub - https://github.com/Tbrosnan12/Hamilton-trust-2023

Work Experience

Teaching Assistant 2023 - Present

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-Present

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

Arthur Lyster Prize 2021

Trinity College-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. PLANCKS is a exam-based physics competition for bachelor's and master's students.

Hackathons: I have had the opportunity during my undergraduate degree to both participate and co-organise "Hackathons" which are time-bound events where teams collaboratively create innovative physics based solutions to specific challenges, often based on socio-economic problems.

Open Source Software & Learning Materials: I am passionate about the open-source philosophy, which emphasizes accessibility, collaboration, and shared knowledge. To contribute to this ethos, I make my notes and source code freely available on my website https://tbrosnan12.github.io, where they are accessible to anyone interested in learning, or building upon my work.

Basketball: I am a member of my local basketball Club Eanna BC, where I play for their division 4 team.

Reading: I read extensively both to further my knowledge of my field and 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