

# Shanmathi Gnanabalan

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Master's Student Educated in Physics and Environmental and Energy Engineering and Experienced in Data Analysis Roles. Interested in Roles Across Renewable Energy, Sustainability, and Energy Management.

## Education

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2024 – Present      **The University of Sheffield**  
**MSc Environmental and Energy Engineering**  
On Track for Distinction (>70%)

Focused on low-carbon technology, energy systems and pollution abatement strategies, as reflected in the following projects:

- Developed air pollution control and CO<sub>2</sub> capture solutions for a 120 MW biomass power plant; aligned with UK emission limits and green engineering principles.
- Audited energy use of a UK primary school, developing energy management strategies using monitoring & targeting (M&T), cumulative sum (CUSUM) analysis, benchmarking, and the Energy Management Matrix to identify efficiency improvements.
- Applied life cycle assessment (LCA) and circular economy models to assess plastic waste in tea bags and recycling strategies.
- Designed a conceptual nuclear reactor for Singapore's energy needs, including core physics, fuel strategy, and thermal-electric systems.
- Regularly communicate student feedback at faculty meetings as the academic representative for the Environmental Engineering MSc cohort.
- *See Next Page for MSc Project Details.*

2017 – 2022      **The University of Manchester**  
**MPhys (Hons) Physics with Astrophysics**  
Award – 2:2

- Covered all aspects of classical and modern physics, and mathematical modeling.
- Developed strong presentation and writing skills by preparing lab reports and presenting findings to diverse audiences, averaging 68% across all analytical, written and presentation elements in 3 years of lab work and 72.5% across all Master's year projects.
- Awarded the Stellify Award for leadership and impactful volunteering.
- *See Next Page for MPhys Project Details.*

## Work Experience

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2023 – 2024      **The University of Manchester**  
**Data Analysis Intern**

- Produced environmental-style performance reports for 4 hospital sites, analysing datasets from 2,000+ individuals to identify trends and improvements.
- Presented findings to senior stakeholders, informing policy and operational reviews.
- Designed data collection and storage systems, improving monitoring efficiency and data integrity.
- Awarded "Exceptional Performance Award" for outstanding contribution.

## Projects and Certifications

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### 2024 – Present      **Designing Novel Refrigerants for Heat Pumps - MSc Environmental and Energy Engineering Project**

- Developed an optimisation algorithm in gPROMS to design refrigerants and process parameters that produce minimal environmental impact and maximum heat pump efficiency.

### 2021 – 2022      **BCG Climate & Sustainability Job Simulation on Forage**

- Calculated carbon baselines using Excel and verified data against Carbon Disclosure Project (CDP) databases.
- Proposed carbon reduction initiatives, including Scope 3 supply chain strategies, aligned with Net Zero targets.
- Developed targeted communications for stakeholders and investors.

### 2021 – 2022      **Algorithm for the Co-registration of Mass Spectrometry and Optical Microscopy Images - MPhys project**

- Collaborated with Kratos Analytical Ltd., Trafford, Manchester and the Wolfson Molecular Imaging Centre (University of Manchester).
- Developed a Python algorithm to automatically rescale, realign, and overlay mass spectrometry and optical microscopy images on a pixel-by-pixel basis.
- Although created for scientific imaging, the methodology has clear potential for environmental applications such as pollution tracking or ecological monitoring from satellite imagery.

## Additional Skills

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- **IT:** Experienced in programming in Python and gPROMS through academic projects in Physics and Environmental Engineering. Proficient in using Microsoft Office, with experience using Excel macros and Power BI for data analysis and reporting.
- **Multilingual:** English (Fluent), Tamil (Native), Hindi (Conversational), French (Beginner).
- **Provisional Driving Licence:** Actively taking lessons and scheduled to take a test in early 2026.

### **Professional Affiliations:**

Student member - Energy Institute.

Student member - IEMA (Institute of Environmental Management and Assessment).

Member - Institute of Physics.