# Henry Morten

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## Personal Profile

First year PhD student studying in the School of Aerospace Engineering, at the University of Liverpool (UK. Having a background as a Geophysicist in the Earth Science department, my primary interests stem from how the use of computing can help solve conceptually difficult planetary based problems.
Dedicated to bridging the gap between between these two disciplines, my research is co-funded with the European Space Agency. The majority of my time will be spent defining the most effective radio science strategy for detecting high order gravitational anomalies in asteroids, and categorising what types of measurements can be achieved from CubeSats operating in near proximity to asteroids.

## Education

### University of Liverpool — *Liverpool, UK*

PhD in the School of Aerospace Engineering — *March 2024 - Current*

- Geophysics PhD. Co-Funded by the School of Engineering, and the European Space Agency.
- Primary supervisor at the University of Liverpool is Dr Stefania Soldini
- Potential (unconfirmed) for up to 6 months to be spent at ESOC (European Space Operations Centre), to contribute to the development of GODOT.

### University of Liverpool — *Liverpool, UK*

BSc (Hons) Geophysics (Physics) — *September 2020 - July 2023*

- Graduated with a first class honours degree, accredited by the Institute of Physics
- Dissertation titled: "The magnetic fields of Uranus and Neptune from Voyager data", supervised by Professor Richard Holme
- Introduced principles such as: remote sensing using Python with data acquired by the LANDSAT 8 Satellite, Machine learning and non-linear inverse methods with gravity applications, tools on how to produce Geophysical Models in Linux, the dangers of non-uniqueness, matrix analysis, and optimisation theory and statistics.
- There were fieldwork elements that ran with the input of SEP Geophysical, where I learned how to use equipment and techniques used in Exploration Geophysics such as: EM31/34, Seismic Refraction, Magnetic Gradiometry, and Ground Penetrating Radar

### Aquinas College — *Stockport, UK*

3 A-Levels — *September 2018 - June 2020*

- Geography, Maths and Physics
- Centre assessed at grade B (Due to COVID-19 pandemic there was no formal assessment)

### St Thomas More School, and Royal Air Force Air Cadets — *Buxton, UK*

12 GCSEs or Equivalent BTEC — *September 2013 - June 2018*

- BTECs include: Teamwork and personal development in the community, Aviation Studies, and PE (Physical Education)
- All subjects passed, including all required fundamentals including English, Maths and Science

## Career Highlights

### European Space Agency — *Noordwijk, Netherlands*

Geophysics Research Scientist — *October 2024 - October 2025*

- Detecting gravity anomalies in asteroids, by reconstructing their density distribution. I'm expected to spend at least a year at ESTEC (European Space Research and Technology Centre) in the ACT (Advanced Concepts Team) group, developing theory and methods to use artificial intelligence for solving inverse gravity problems.
- This will be completed alongside my PhD, why by my supervisor at ESA will be Dr Dario Izzo.

### Ensana Hotels, Buxton Crescent Hotel — *Buxton, UK*

Food and Beverage Assistant — *August 2023 - December 2023*

- Working full time, in the hospitality industry.
- Frequently working all positions in the hotel restaurant, often being solely responsible for its operation.
- Often was the sole bartender, during large functions and at the companies sister hotel (Old Hall Hotel - Buxton, UK).

### TP. Morten and Sons Dairy Farm — *Nr Buxton, UK*

Farm Hand and Labourer — *January 2014 - July 2019*

- General farm labourer, driver and machinery operator.
- Combination of full time and part time work as a general manual labourer on a family- owned Dairy Farm.
- Responsibility was instilled on me from a young age, varying in roles from things such as the use, and maintenance of valuable and hazardous pieces of machinery
- Working with large animals in a variety of environments and locations, often in confined spaces, where maintaining a high degree of personal safety was paramount.

# Volunteering

**Society Treasurer** *Liverpool, UK*

University of Liverpool, Herdman Student Society *September 2022 - September 2023*

- Peer elected as apart of an academic society for anybody interested in the Earth Sciences, ranging from Undergraduates to Professors.
- Directly involved with the organising and running of a weekly extra-curricular lecture series where faculty can attend and learn about topics related to the earth sciences with related talks from academics, or related industries. For instance, talks have been led by Tektonik Consulting Ltd, and RSK.
- The society also holds a yearly Symposium, which is a careers and networking event all students and staff can attend.

**Volunteer Fundraiser** *Bomet County, Kenya*

Dig Deep (Africa) *May 2021 - August 2022*

- I have a passion for hiking, this summer having worked extensively with a UK based charity (Dig Deep) - together with a group from Liverpool, we summited Mt Kilimanjaro, Tanzania (Informally – we were the "Kilimanscousers").
- As a group we raised a total of £34,293 for charity.
- The money has gone towards improving clean water access, creating safe toilets, and good hygiene for some of Kenya's poorest residents.

**A weeks work experience at a light engineering company** *Sheen, UK*

Altrad Belle (Belle Engineering (Sheen) Ltd) *May 2019 - May 2019*

- Worked as a part of the Research and Development Department.
- I was involved in the discovery of assembly problems with Plate Compactors – incorrect gearbox assembly was leading to the construction of destructive harmonics, causing no directional motion.
- I learnt how to work practically with my hands and using other pieces of machinery / tools in a safe and controlled manner.

# Skills

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| **Programming:** | Python (Pandas, Matplotlib, NumPy, Scikit-learn. etc.), MATLAB, Linux. |
| **Soft Skills:** | Microsoft Office, Time Management, Teamwork, Problem-solving, Documentation. |
| **Subjects:** | Geophysics, Planetary Physics, Geology. |
| **Areas I am improving:** | Shell (Bash/Zsh), LaTeX(Overleaf/VScode), Git, lower level languages (C,C++, Fortran etc). |

# Interests

Growing up on a dairy farm in the UK, my hobbies and interests probably varied rather dramatically from what would be considered typical. I've grown up around both large animals and machinery, and spent a large proportion of my childhood outside. As a result, today my interests range from anything to do with working with my hands, to mechanical engineering, hiking, climbing and cycling!

An example of this would be in addition to climbing Mt Kilimanjaro in 2022, while I was apart of the Royal Air Force Air Cadets - back in 2018 I took part in an expedition to Mt Everest's Base Camp in Nepal. As a combined group of 21, we successfully climbed a nearby mountain, Kala Patthar, then took part in some additional voluntary manual labour work at nearby village monastery.

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| **Hiking:** | Love taking part in smaller day hikes in the UK, and longer multi-day expeditions wherever I can |
| **Linux:** | Helps to give me an insight into the inner workings of my desktop |
| **Software Development:** | Beyond the scope of my Undergraduate degree, other languages and processes |
| **Geology:** | Having grown up around some of the largest quarries in the UK |
| **Physics:** | Anything from Geophysics, Electromagnetism or Quantum physics! |
| **Motor-sports (F1):** | Love watching teams stratergise, before and during a race weekend |

**References available upon request.**