Gray-Milne Travel Bursary Report: Attended Castle Meeting 2024

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I am very thankful to have been awarded the Gray-Milne travel bursary as it enabled me to attend my first international conference in Utrecht, Netherlands. I presented part of my PhD work on determining palaeo-stress signals using rock magnetism at the biannual castle meeting 2024.

My PhD has been focussing on low pressure stress effects on rock magnetism, specifically focusing on the anisotropy of magnetic susceptibility; by conducting uniaxial stress experiments. I have also been studying the formation of columnar joints and how differential stress from cooling mechanisms has been imprinted in the anisotropy of magnetic susceptibility. Using both of my studies I was able to determine paleo-stress and orientation signals on columnar basalts. Quantifying and resolving orientations of ancient stresses, i.e. palaeo-stresses can provide us with valuable insight into fault-driven seismic events. Although, there is currently no generally accepted approach to confirm palaeo-stress estimates. One way to determine palaeo-stress is using rock magnetism. Stress and shock effects have been studied extensively at high pressures > 2GPa showing magnetising and demagnetising effects on rocks. However, at these extreme pressures' rocks are exposed to heating and deformation, thus unable to record a stress signal. My talk at the castle meeting was presenting how we can retrieve palaeo-stress signals at low pressures by avoiding heating and deformation effects on smaller geological features such as columnar joint; from this finding it has the potential to be used as a tool for palaeo-seismology.

Figure 1: Presenting my work at the Castle meeting.

Figure 2: Awarded with best talk.

Attending the castle meeting has greatly benefited me by expanding my knowledge of the latest advancements in palaeomagnetism and providing valuable networking opportunities with experts in my field. It allowed me to exchange ideas and discuss my research with other academics inspiring new ideas. In addition to this presenting my work at the Castle meeting helped me gain confidence, improve my communication skills and most importantly increasing my visibility within the palaeomagnetism community. I was awarded with the IAGA (International Association of Geomagnetism and Aeronomy) Early Career Award for the best talk at the conference this year. IAGA have invited me to attend their annual conference next year which is taking place in Lisbon, Portugal.

The Gray-Milne bursary of £500 contributed towards my participation and attending the castle meeting, and significantly reducing any financial strain. I would like to thank the British Geophysical Association for giving me this incredible opportunity to share my research and gain recognition.