

Mineralogical Society report for bursary awarded to Thomas Barrett, School of Physical Sciences, The Open University

Project Title: Apatite microstructures and its volatile composition in eucrites.

I am extremely grateful to the Mineralogical Society of Great Britain and Ireland for awarding me a Senior Travel Bursary in 2019. This award allowed me to attend the 50th Lunar and Planetary Science (LPSC) conference in The Woodlands, Houston, Texas. LPSC is the largest conference dedicated to planetary science and this year was particularly auspicious being not only the 50th anniversary of the conference but also 50 years since the first Moon landing. This meant that this year had a record number of abstract submissions as well as attendants and several special events to mark the occasion. My contribution to the conference was one first author poster (Fig. 1, abstract #1689) and one co-authored poster on comparing Howardite-Eucrite-Diogenite meteorite crystallographic structures (Forman et al, abstract #1374).

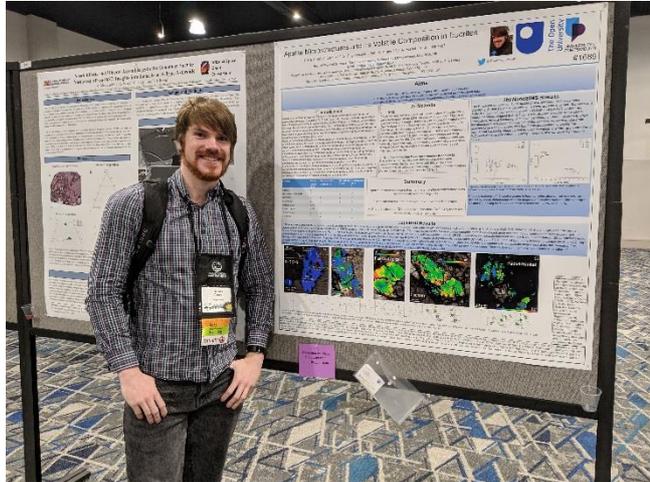


Figure 1: Me at my poster

Conference: The conference itself ran from Monday 18th to Friday 22nd March, with a number of small periphery meetings on the Sunday before. I attended one such meeting entitled “How to do Science on a Commercial Lunar Lander” to gain some insight into the state of commercial space missions and provide feedback as a scientist as to the type of experiments we would like to make (e.g. lunar regolith analysis). The rest of the week was filled with interesting talks on a large variety of topics; the talks I attended were mainly on shock processes and volatile elements. Both of my posters were in the Thursday evening poster session. My main poster presented volatile (H and Cl) abundance and isotopic composition data from apatite measured by Nano Secondary Ion Mass Spectrometry (NanoSIMS) combined with new Electron Backscatter Diffraction (EBSD) maps. This allows us to begin to piece together any potential links between observed microstructure and volatile abundance and isotopic composition which could be a powerful tool in understanding the history volatile evolution in these meteorites.

At LPSC, I had the unique opportunity to discuss my project and network with colleagues and potential collaborators from institutes all around the world. I found discussions about my work and its wider implications very encouraging and provided me with interesting additional avenues of research for the future.

Future Work: To continue NanoSIMS work on eucrites with known higher shock pressures to increase the range of samples currently analysed.