BGA Gray-Milne Travel Bursary Report – Claire Orlov – Iceland Fieldwork July 2022

Using the funds provided by the BGA Gray-Milne Travel Bursary I recently completed fieldwork in Iceland as part of my PhD research. The aim of my PhD is to improve our understanding of the evolution of tectonic deformation associated with the Tharsis Rise, the largest volcano-tectonic province on Mars. I am doing this by studying the structural evolution of a plateau in the northeast of Tharsis called Tempe Terra. My work involves detailed mapping and structural analysis based on remote sensing data of the surface of Mars. Since visiting Mars isn't possible (yet!), doing this fieldwork in Iceland provided an important opportunity to study similar structures up close.

Our first few days were spent exploring the Reykjanes Peninsula in the southwest if Iceland, where we could observe active volcanic rifting processes within the Western Rift Zone (Photo 1). This provided the opportunity to see large, en echelon structures resulting from oblique rifting, which are also significant features of Tempe Terra.

We spent the majority of our time in the Eastern Rift Zone/North Volcanic Zone in the northeast of Iceland, where we studied beautifully-exposed dyke-driven normal faults and graben from the Krafla fissure swarm (Photo 2). I also had the chance to observe pit crater chains around Krafla, which are linear chains of circular depressions that are a common feature of many planetary surfaces and an important component of Martian grabens (Photo 3).

The perspective I gained from in-person observation of these structures and their complexity at field scale was invaluable. In particular, this will help me as I progress to the stage of linking observed structures in my study area to their formation processes. I am extremely grateful to the BGA for awarding me the Gray-Milne Travel Bursary and making this possible.