Postgraduate Conference Support: 48th Lunar and Planetary Science Conference (LPSC), The Woodlands, Texas, 20-24th March 2017

Jack Wright – second year PhD student studying the geology of the planet Mercury

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Summary

I was able to attend LPSC 2017 in part due to a generous travel grant of £550 awarded to me by the BSG. LPSC is the most prestigious gathering of worldwide planetary scientists and I was grateful for the opportunity to present some of my own research there. This included the main focus of my PhD, producing the first geological map of the Hokusai quadrangle of the planet Mercury. I also presented my study of the decline of plains forming volcanism on Mercury and my discovery of two candidate shield volcanoes on its surface. The conference also offered a variety of talks and posters that were both interesting and directly relevant to my own work. In particular, I benefitted from presentations on impact cratering, planetary volcanism and planetary geological mapping. Without BSG support, I would not have been able to attend LPSC, publicise my work and meet potential future collaborators.

Geological mapping of the Hokusai (H05) quadrangle of Mercury (poster)

Having presented my map at LPSC 2016, I had the opportunity to give an update on the current status of my map, one year later. Many other planetary mappers were at this poster session and so I was able to exchange mapping ideas and strategies with them. I had valuable discussions with representatives from the USGS, which publishes planetary geological maps. Furthermore, attending LPSC allowed me to communicate the European effort to map Mercury as well as learn about the American mapping projects, fostering potential international cooperation.

Late-stage effusive volcanism on Mercury (poster)

My second poster was about the decline of plains forming volcanism on Mercury. The planet's geological evolution has been largely governed by secular cooling of its interior and global contraction of its single-plate lithosphere. Global contraction is thought to have stopped lava extrusion ~3.5 billion years ago, but younger lava flows have been argued to exist in younger impact craters. In this work, I am searching for young, volcanically flooded craters in order to track how Mercury's interior cooled to determine if and when it became too cold to generate melt. I presented the early state of this project and was able to discuss my methods and predictions with many planetary scientists.

Volcanic shields on Mercury identified at last? (talk)

Finally, I gave my first oral presentation at an international conference. My talk was about two positive relief features (~10 km across) on Mercury that are most easily explained as volcanic edifices, specifically shield volcanoes. These are the best candidate constructional volcanic edifices of any kind on Mercury. I was able to discuss my explanation for the formation of these features and make predictions about where more might be found. The discussion session following my talk meant that I got immediate feedback and suggestions for further avenues of enquiry. This will help me improve the paper I am currently writing on this subject.

Importance of BSG funds

BSG funding was vital to my LPSC attendance this year. The £550 I was awarded covered the cost of my accommodation for the duration of the conference (£478) with the remainder contributing towards my other expenditure (flights, conference fee, subsistence). My application for BSG funds also improved the cases for my successful applications for funding from the British Remote Sensing and Photogrammetry Society and the Royal Astronomical Society, so I am greatly indebted to the BSG.

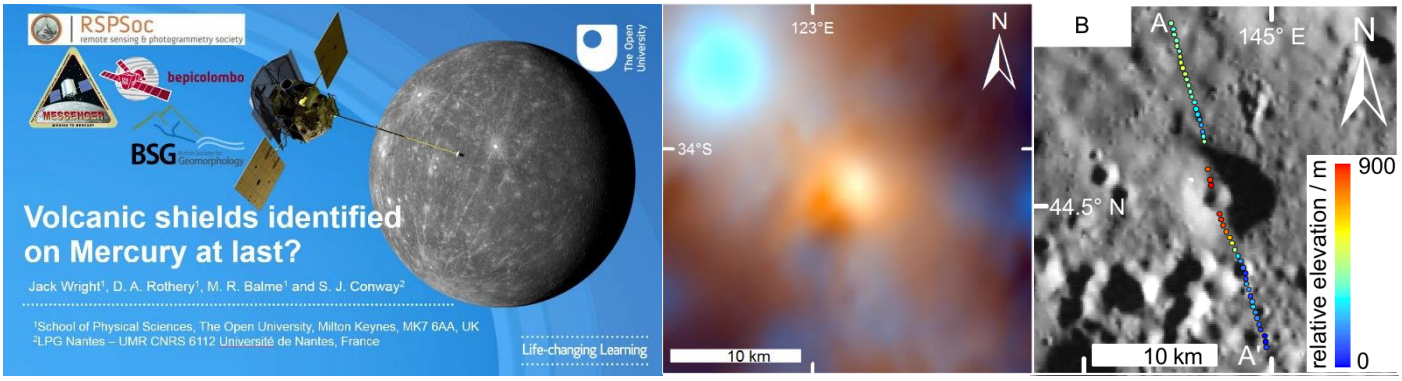

Figure 1. Left: the title slide of my talk given on 24th March at 10am (CST) in the Mercury: From Crust to Core session. **Centre:** the red spectral anomaly coincident with my first candidate shield, suggestive of a pyroclastics. **Right:** monochrome image of the similarly sized second candidate shield with colour coded laser altimetry data indicating a diameter of 12 km, a height of 800 m and average flank slopes of ~8° (comparable to Earth examples). A central summit depression is clearly visible.