

Europlanet TNA Report

PROJECT LEADER

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COLLABORATORS

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Date of TNA visit:	27/9/10 – 1//10/10
Host laboratory:	DLR Berlin, Planetary Emissivity Laboratory

Project Title – Inter-comparison of thermal emissivity measurements of lunar analogue minerals.

- Report on the outcomes of the TNA visit (approx 1 page)

The main aim of the visit to the Planetary Emissivity Laboratory (PEL) at DLR Berlin, supported by the Europlanet TNA, was to provide an inter-comparison of calibration targets and mineral samples previously measured in a similar spectral emissivity chamber recently completed at the University of Oxford to support measurements of Moon in the thermal infrared. The major difference between the Oxford and DLR systems are the vacuum and thermal environments the mineral samples can be measured under. The DLR system has the unique capability to reach very high ($\approx 700\text{K}$) temperatures, whereas the Oxford system operates under a high vacuum ($< 1 \times 10^{-6}$ mbar) and with a cold thermal shield to simulate the lunar environment.

Five days of support were provided, and during this time working with the staff at the PEL we were able to complete measurements of 13 mineral samples and compare our radiometric (blackbody) calibration targets. Our highest priority measurements, and the most technically complex regards interfacing our equipment to the PEL setup, were the measurements of the calibration targets. These measurements were successful, giving us additional confidence in our test and calibration procedures now the targets have returned to Oxford. The mineral spectra are still being analysed, but the high throughput of samples achieved was very impressive and the quality of the data looks good.

The results form part of the thesis work for one of my current doctoral student, so the opportunity to work in another European laboratory with the team at DLR was an extremely beneficial piece of additional training. The student is currently writing the work up, and once they have submitted their thesis, we will develop the measurements into a paper detailing the

outcome of the inter-comparison. We are also considering submitting the work for presentation at this year's joint American Astronomical Society Division of Planetary Science and European Planetary Science conference in Nantes later in the year, with the agreement of our colleagues at the PEL.

In summary, this was a very successful visit that has provided us with timely results to support our own experiments.

- **Host approval** The host is required to approve the report agreeing it is an accurate account of the research performed.