1. **Luminescence of Apollo lunar samples**

by J. E. Geake \( ^a \), G. Walker \( ^a \) and G. F. J. Garlick \( ^b \)

**Abstract** Luminescence emission spectra in the visible and near IR regions are shown for Apollo 12 samples, which are compared with Apollo 11 samples and with terrestrial and synthetic materials. Excitation is by 60KeV protons. The distribution of the luminescence emission from the rock and breccia samples is investigated, permitting identification of luminescent constituents, and showing plagioclase to be the most efficient one. The mechanism of this luminescence is discussed. Microphotographs are used to show erosion effects due to proton bombardment, and Stereoscans are used to examine the surface texture relevant to optical polarization effects.

2. **Thermoluminescence, EPR and diffuse reflection spectra of Apollo lunar samples**

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**Abstract** Apollo 11 and 12 samples, and terrestrial and synthetic plagioclases, have been examined and compared as regards TL, EPR and diffuse reflection spectra. All lunar samples and the plagioclases show similar TL characteristics, except that glow peak positions vary slightly with the albite/anorthite ratios and that the terrestrial and synthetic plagioclases show TL emission in the IR region, which the Apollo samples do not. Apollo 12 fines show about 10x the TL efficiency of Apollo 11 fines, but still show the leak-away of trapped electrons at room temperature. Apollo 12 samples show 2 or 3x the optical reflectivity of Apollo 11 samples and similar spectra in the visible region. The reflectivity in the near IR region is relatively higher for Apollo 12 samples due to the absence of ilmenite. EPR spectra for Apollo 12 fines are like those for Apollo 11 fines, but Apollo 12 rocks show very weak signals.