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## **A COMPREHENSIVE RAMAN SPECTRAL LIBRARY OF MINERALS WITH SEARCH/MATCH CAPABILITY**

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The Raman spectrum of a given mineral offers a unique signature that can be use for identification, determination of composition, and as an indicator of the degree of cation order/disorder. For these reasons there has been considerable effort directed towards the aquisition and study of Raman spectra. In general, a high quality Raman spectrum can be recorded from a sample in a couple of minutes with very little sample preparation. However, there is no easily accessible or complete library that can be used to compare and identify an unknown mineral. The authors are building such a database that will be made available to the general public through Internet search/match routines. The composition of each sample will be determined by electron microprobe, crystallographic parameters will be obtained with powder and single-crystal diffraction measurements, and both oriented and unoriented, polarized and unpolarized Raman spectra will be recorded. The goal is to provide a library that is capable of identifying all possible mineral specimens, with additional emphasis upon the estimation of chemistry. Funding from NASA's Instrumentation Development program has resulted in research quality portable Raman spectrometers that are the size of a cell phone. It is anticipated that the coupling of this database with the portable Raman spectrometers will allow simple and fast phase identification both on the Mars Rover and by the general public on Earth.