

THE GAS ANALYSIS PACKAGE ON THE BEAGLE2 LANDER

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The Gas Analysis Package (GAP) is designed to make quantitative and stable isotopic measurements of the martian atmosphere and solid materials collected from both the martian surface and regolith or cored from within rocks. The primary aim of GAP is to search for the existence of bulk constituents, individual species and isotopic fractionations consistent with extinct or extant life. Secondary aims are the investigation of the processes of planetary history, atmospheric evolution and circulation, the nature of gases trapped in rocks, low temperature geochemistry, rock ages, etc.

At the heart of GAP is a 6 cm radius magnetic sector mass spectrometer, which operates in both static and dynamic modes. Prior to analysis in the mass spectrometer gaseous samples will be processed by a "miniature laboratory" comprising a suite of chemical reactors. In addition solid samples are initially processed by the stepped combustion and pyrolysis techniques.

As usual for a space flight instrument, one of the major constraints is that the total mass available for GAP is restrictive. A low mass for GAP has been achieved by making the system as compact as possible, use of novel materials and by the use of miniature components for the gas inlet system. The talk will concentrate on the development and manufacture of GAP and the relationship of the constituent components with scientific aims.