

Mass spectrometers for in situ planetary exploration

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Mass Spectrometers have been used for a number of studies in Planetary Science. Now that NASA is moving into an era of in-situ science, the variety of mass spectrometers will increase to answer the wide range of scientific questions that have to be answered on many different bodies. As a result, even though there have been several mass spectrometers used in missions, such as Galileo and Cassini, flying in-situ instruments to solar system bodies where there is a wide variety of extreme environments is even more challenging . These new mass spectrometers will probably have to function in the ice-covered oceans likely to be found on Europa, various regions of Mars and the surface of Titan. In addition, in order to meet the launch mass they are likely to be miniaturized. These instruments must all withstand the rigors of space plus operate over long periods of time in harsh environments. This talk will examine some of the mass spectrometers that have flown, discuss the mass spectrometer that are needed and present some of the approaches and philosophies we must employ in designing, building and testing instruments for in situ scientific investigations.