

# The Sample Analysis at Mars (SAM): Developing Analytical Tools to Search for a Habitable Environment on Mars

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NASA's next exploration mission to the surface of Mars, the Mars Science Laboratory (MSL), is scheduled to be launched in late November 2011 and will land on the Mars surface in August 2012. MSL's rover, named Curiosity, will operate on Mars for at least one Mars year (approximately two Earth years) and explore and quantitatively assess the habitability of the region by measuring any complex organic molecules as well as isotopic composition of inorganic and organic carbon that may be present in rocks and soils. One of the scientific instruments on board Curiosity is the Sample Analysis at Mars (SAM) instrument suite consisting of a Quadrupole Mass Spectrometer (QMS), a Gas Chromatograph (GC) and a Tunable Laser Spectrometer (TLS). The QMS and GC can operated together in a GCMS mode. The TLS obtains precise isotope ratios for C and O in carbon dioxide and measures trace levels of methane and its carbon isotopes. This presentation will focus on some of the engineering challenges facing the SAM team during the development stages and thru the integration and delivery of the suite to the Rover.