



## **SARA on Chandrayaan-1**

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SARA (Sub-keV Atom Reflecting Analyzer) is a package of an energetic neutral atom (ENA) imaging mass spectrometer (CENA, Chandrayaan Energetic Neutrals Analyzer), a solar wind monitor (SWIM, Solar Wind Monitor), and a digital processing unit (DPU). CENA provides measurements of ENA fluxes, energy, and mass in the energy range 10 eV - 3.3 keV using the surface interaction technique. SWIM measures ion fluxes (with mass resolution) in the energy range 10 eV - 15 keV. ENAs in the lunar environment are produced via sputtering by and backscattering of the solar wind protons. Imaging of these ENAs will be used to study the elemental surface composition (sputtering preserves stoichiometry), surface magnetic anomalies and associated mini-magnetospheres, which create voids in the sputtered/backscattered ENA images. Sputtered ENA images also reveal the lunar exosphere sources and space weathering effects. SARA is the first ENA imaging mass spectrometer of its kind to be flown on a space mission. A replica of SARA is planned to fly to Mercury onboard the Bepi Colombo mission CENA on MMO and SWIM on MPO.