

## **Non-Thermal Loss of Martian Atmosphere:**

### **Insights from the Seasonality of the Escaping Ion Composition**

Recently published results from NASA's Mars Atmosphere and Volatile Evolution (MAVEN) mission significantly contributed towards an enhanced understanding of evolution of the martian climate: from an early, warm and wet planet to its current state. The available results show Mars' atmosphere suffered major escapes owing to stripping by solar wind. Different atmospheric loss processes are still active. For this project, I want to study the seasonality of the dominant escaping ions, based on observations made by the MAVEN mission, to investigate the non-thermal loss of martian atmosphere. In doing so, I will use the key parameter data collected by the MAVEN Supra-Thermal and Thermal Ion Composition (STATIC) instrument. STATIC measures ionospheric ion composition of martian atmosphere within 0.1–30 keV maintaining a 4-second base time resolution. This instrument is particularly aimed at making measurements—to determine mass, energy, flux and velocity—of four major ion species ( $\text{H}^+$ ,  $\text{O}^+$ ,  $\text{O}_2^+$ ,  $\text{CO}_2^+$ ). Analyzing the seasonal variability of the composition of escaping ions, I want to predict the dominant ion species driving the non-thermal loss processes, in terms of ion fluxes for a particular martian season. Results obtained from such analyses may help correlate atmosphere-surface interactions with the non-thermal escape of martian atmosphere.