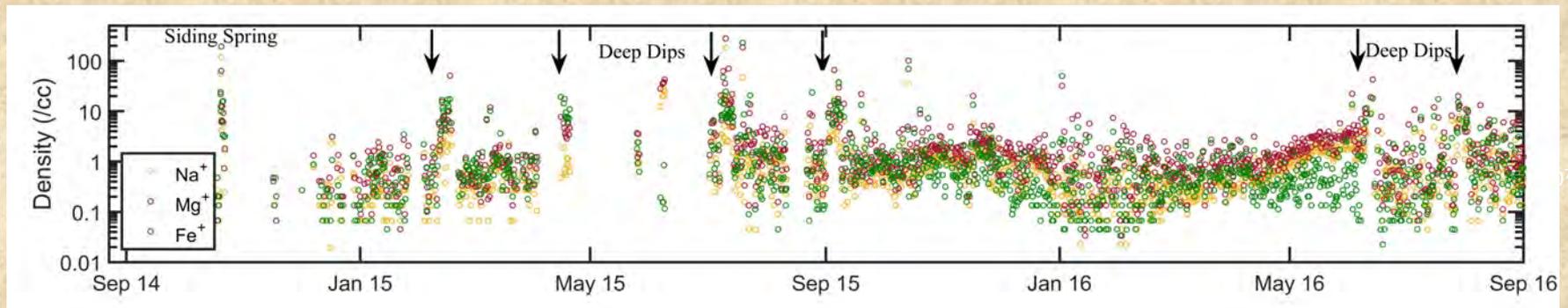


Permanent Presence Of Meteoritic Metal Ions In Mars Upper Atmosphere

- Interplanetary dust is swept up by orbiting planets and falls down towards their surfaces.
- Incident speeds are so great that on impact with the atmosphere the dust heats, melts and almost explosively ablates, depositing showers of neutral metal atoms/ions., including Mg^+ , Fe^+ and Na^+ .
- These metal ions, which have been well studied on Earth, have long chemical lifetimes and readily disperse to high altitudes from their production region in the mesosphere
- But they have never been directly detected at any other planet.
- The MAVEN spacecraft Neutral Gas and Ion Mass Spectrometer (NGIMS) has now provided observations of these ions at Mars.



- Shown are more than two years of observations by NGIMS of the maximum metal ion concentrations encountered on each MAVEN Orbit, including those executing 'deep dips' where periapsis is lowered from ~ 160 km to ~ 120 km.
- Besides the first in situ detection of metal ions at Mars, these results provide unprecedented (even by Earth standards) measurements of the metal composition changes in time, location and altitude.
- In addition to representing ongoing cosmic material infall, these Metal ions are thought to affect processes such as cloud nucleation. Cloud formation plays an important role in weather and climate.