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Science News

Rover data gives clues about Mars' missing atmosphere

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GREENBELT, Md., July 18 (UPI) -- Scientists say new data from NASA's Curiosity rover offer clues to how Mars lost its original atmosphere, thought to be much thicker than the one left today.

Curiosity's Sample Analysis at Mars suite of instruments measured the abundances of different gases and isotopes in samples of Martian air, NASA reported.

The ratios of heavier to lighter isotopes of carbon and oxygen in the carbon dioxide that makes up most of Mars' atmosphere today, compared with the proportions in the raw material that formed the planet, suggests the planet's atmosphere escaped from the top, rather than due to the lower atmosphere interacting with the ground, NASA scientists said.

When a planet's atmosphere escapes into space, the lighter versions of each element tend to go first off first, with the heavier isotopes staying behind longer, they said.

"The isotope data are unambiguous and robust, having been independently confirmed by the quadrupole mass spectrometer and the tunable laser spectrometer, two of the SAM suite instruments," said Sushil Atreya, professor of atmospheric, oceanic and space sciences at the University of Michigan.

It's unclear exactly how much atmosphere Mars has lost and exactly why, but scientist say they have some suspects.

Mars once had a magnetic field, similar to Earth's, that would have shielded its atmosphere against charged particles from the sun, but as the planet's iron core cooled down, the magnetic field faded, leaving its atmosphere vulnerable to the onslaught from those particles.

"On Mars they just go slamming into the atmosphere and can strip it away," Paul Mahaffy, lead scientist for the Sample Analysis at Mars suite, said. "That's probably one of the significant mechanisms for current atmospheric loss."

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