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The Atmosphere of Mars: Sources and Sinks

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The recent ASPERA measurements of elements leaving the Martian atmosphere show that the ion-driven escape of gases is insufficient to deplete an early, dense atmosphere on Mars (Lundin et al. 2007). It thus appears that previous proposals suggesting impact erosion as the dominant removal process are most likely correct. This conclusion is substantiated by noble gas abundances and the presence of a high value of CO_2/N_2 in the present atmosphere. It is then interesting to try to relate the original volatile inventory on Mars to those of Venus, Titan and Earth, and investigate the role of icy planetesimals in delivering volatiles to all three planets and Saturn's largest satellite.