



## **Photometric and spectral evidence for deliquescence and liquid saline water on Mars**

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Determining if life ever existed on another planet is one of the main goals of space exploration. Since it is believed that liquid water is a basic ingredient for life, an important step in the search for extraterrestrial life is to determine if liquid water exists in other planets. Mars is the most Earth-like planet in the solar system and there is evidence that it had liquid water in the past. Therefore, Mars is an excellent candidate for searching for signs of past microbial life. The recent discoveries of evidence for interfacial water, for liquid saline water or brines, and for methane on Mars have excited the science community by reviving the possibility of extant microbial life in this nearby planet. Here we show photometric and broadband spectral evidence that liquid saline water exists on Mars. In addition, we show that this finding indicates that deliquescence occurs seasonally on Mars' polar region. These discoveries support the hypothesis that freezing/thaw cycles lead to the formation of brine pockets where ice and salts coexist in the shallow martian subsurface. This has important implications for the search for extraterrestrial life because a diverse array of terrestrial microorganisms thrives in brines.