MEDIA RELEASE

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ATTENTION: Chiefs of Staff, News Directors

Opportunity knocks for UTAS professor on the rim of a Mars crater

Conclusive proof that water once flowed on the Martian surface has been found in a huge ancient impact crater named after Captain Cook's ship.

A paper by an international team of researchers, which includes the University of Tasmania's Professor Paulo de Souza, published today by the prestigious journal *Science,* reports findings from an investigation of the rim's stratigraphy by the rover Opportunity.

Dr de Souza, who joined the UTAS Human Interface Technology Laboratory in Launceston from CSIRO early this year, has been part of NASA's Mars team since 2002.

The rover Opportunity landed on January 24 2004, three weeks after its twin, Spirit, set down. Eight years later, Opportunity is still exploring the Martian surface (Spirit operated for more than five years before becoming irrecoverably stuck in a sand trap).

It is scheduled to be joined in August by the Mars Science Laboratory, a rover named Curiosity, which is about five times the size of Spirit and Opportunity.

"We never thought the Opportunity mission would last as long as it has, so initially the Endeavour crater was only considered a long-term goal," Professor de Souza said.

It took the rover seven years to navigate the 33 kilometres from its landing spot to reach a feature on the crater rim named Cape York. The effort was rewarded with the discovery of gypsum, a key geological indicator of the historical presence of water and not found elsewhere by either of the two rovers.

"We can not dig more than a few centimetres with the rover so the best way is analyse soil is to approach craters," explains Professor de Souza. "The whole structure of a crater will reveal what's in the subsoil.

"Fortunately for us, there are a large number of craters on Mars which are well-preserved. For geologists it is as if time has stopped. The crater rims have not been eroded by the elements as they have been on Earth.

"When you see the deposits you can understand which processes took place. Sedimentation was one of them. Volcanism was very intense on Mars – for example, the volcano Olympus is the highest peak in the solar system, three times higher than Mt Everest.

“Since the Viking missions we have been aware of minerals that indicate this process of crystallisation of lava. It produces what we call primary rocks. If you expose those rocks to water, then they will be dissolved in different minerals, gypsum being one,” Professor de Souza said.

“Key minerals revealing wet processes could be everywhere on Mars but we don’t know – it is too deep below that surface, that’s why exploring craters is so attractive.

“The big question still to be answered is, how long was water present on Mars–and was there enough time for life to be formed? Perhaps Curiosity will shed some light on that.”

Opportunity has been reactivated after its winter sojourn and will continue to explore the rim. Back on Earth, Professor de Souza will focusing on his new UTAS appointment, in which he will drive the scientific side of the State-wide SenseT data sensor network project.

The paper *Ancient Impact and Aqueous Processes at Endeavour Crater, Mars* can be viewed online:
http://www.sciencemag.org/content/336/6081/570

Caption details for attached image: This colour view of a mineral vein called Homestake comes from the panoramic camera (Pancam) on NASA's Mars Exploration Rover Opportunity. The vein is about the width of a thumb and about 45 centimetres long. Opportunity examined it in November 2011 and found it to be rich in calcium and sulphur, possibly the calcium-sulphate mineral gypsum. Homestake is near the edge of the Cape York segment of the western rim of Endeavour Crater. Image courtesy of NASA.

Information Released by:
The Media Office, University of Tasmania
Phone: (03) 6226 8518; 0429 336 328 (Peter Cochrane)
Email: Media.Office@utas.edu.au