

Opportunity Identifies the Oldest Habitable Environment on Mars

The 10-year-old Opportunity rover has found evidence of an ancient environment on Mars where life could have survived.

In the Endeavour Crater in the Meridiani Planum, Opportunity has detected evidence of an ancient clay-forming, subsurface aqueous environment that is much older than the habitable environment found by Curiosity rover in Yellowknife Bay. While Yellowknife Bay was deposited during the Hesperian period, which began 3.7 billion years ago, the Meridiani Planum was deposited in the Noachian period, and is at minimum, older than 3.7 billion years.



Tracks left by Opportunity en route to Endeavour Crater on Mars.



NASA's Mars Rover Opportunity catches its own late-afternoon shadow in this dramatically lit view eastward across Endeavour Crater on Mars.

Opportunity also found evidence for water-rock interactions before and after the impact that created Endeavour crater.

The findings show that ancient Mars was habitable for life as we know it – though they do not show that life actually existed. For that, future missions will need to look for biosignatures, such as microfossil evidence for microorganisms.