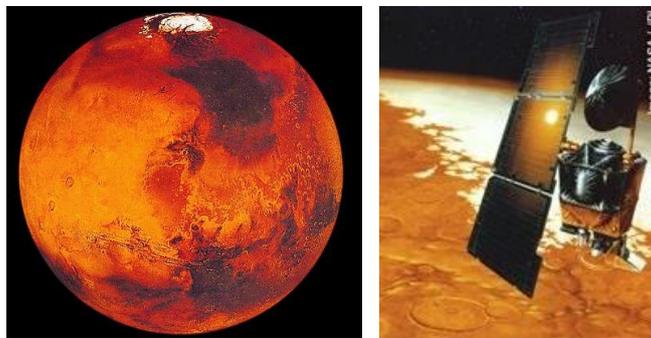


Water on Mars

Matt Balme

Matt Balme is a senior lecturer at Open University. His undergraduate degree was in Physics with Space Science at University College. It was during this time that he took the late Prof. John Guest's Planetary Science lecture course, and this changed his plans completely. Instead of heading into a Physics-based career, he moved to UCL's Geology department to study a PhD based on laboratory and remote sensing studies of tectonism on Venus. He followed up his PhD with a postdoctoral position at Arizona State University, where he began studying Mars. Since then, he has held research positions in the USA, France and the UK, prior to being appointed as a research fellow at Open University in 2007, and then senior lecturer in 2012. His main research interests relate to recent Mars, especially aeolian and ice-related processes, but recently he has worked on ancient martian landscapes, mapping potential landing sites for the ExoMars 2018 Rover.



Mars has generally been perceived as being dry, arid and dead, yet lately news-stories about liquid water on Mars regularly fill the science pages of media outlets. In many ways, our fascination with Mars is tied up with the story of water there. Indeed, the current international exploration of Mars is driven by the question “was (or is) there life on Mars?” and this in turn hinges on water.

With the benefits of data returned from the many orbiting spacecraft and landers sent Mars-wards in the past few decades, it seems clear that Mars once had a lot more water than it does today. During Mars' ancient “Noachian” period (more than 3.7 billion years ago) there was extensive surface dissection by river-like channels and the formation of suites of minerals best explained by the presence of liquid water. Slightly later, outbursts of water in mega-floods carved huge channels across the surface. Since then, liquid water seems to have played a sporadic role in shaping the martian surface and now Mars is mainly cold and dry, with water confined to its solid state as ice. However, recent discoveries of “Recurring Slope Lineae” suggest that there might still be small amounts of liquid water on or near the surface.

This lecture presented some context on martian geology and how we have come to our current understanding. Some of the current “hot” questions were discussed, such as “did Mars ever have a large ocean?” and “are the tiny recurring streaks we see on Mars today dry or wet?” The lecture touched on how planetary scientists try to solve such questions and whether, without fieldwork, we can really do “geology from afar”.

The biggest question remains whether or not there was life on Mars. To explore this, the lecture presented the European ExoMars 2018 Rover mission and the ongoing work being done to determine where it should land. The ExoMars Rover has the ambitious goal of searching not just for evidence of past habitability, but for evidence of signs of past life.