

The perils of spacecraft exploration of Mars and Venus



Venus, Earth and Mars are all rather similar planets in many fundamental respects, being rocky bodies of comparable size, surrounded by thin gaseous atmospheres. They are each very different environments that are challenging to spacecraft exploration. Mars has proved a notoriously tricky planet on which to land a spacecraft, and Europe will be the next agency to try this on 19th October 2016 with the Schiaparelli probe, part of the broader ExoMars missions. Missions to land on Venus have also been successful in the past, although no probe has lasted even an hour in the hostile environment at the

surface. In this talk I will describe some of the perils and pitfalls in landing on another planet and consider why each world has evolved to be so different.

Stephen Lewis is Deputy Head of the Department of Physical Sciences at The Open University. He has taught physics, natural science and environmental sciences at all levels within the Open University and previously taught physics at Oxford University, where he is now a Visiting Fellow in Atmospheric, Oceanic & Planetary Physics. He is a Fellow of the Royal Meteorological Society.

His research interests include the dynamics and climate of planetary atmospheres (ranging from the Earth, both now and in the distant past, to Venus and Mars, giant planets and extrasolar planets) and the interpretation of spacecraft atmospheric observations. He is Co-Principal Investigator for AMELIA (Atmospheric Mars Entry and Landing Investigation and Analysis) on ESA ExoMars 2016 Schiaparelli and is a Co-Investigator for NOMAD (Nadir and Occultation for MArS Discovery) aboard ESA ExoMars 2016 Trace Gas Orbiter and for MCS (Mars Climate Sounder) aboard NASA Mars Reconnaissance Orbiter. Past instrument teams include NIMS (Near Infrared Mapping Spectrometer) on the NASA Galileo mission to Jupiter and PMIRR (Pressure Modulator InfraRed Radiometer) flown twice on the unsuccessful NASA Mars Orbiter and Mars Climate Orbiter missions.

He is a member of the NASA 'Council of Atmospheres' who made successful forecasts for NASA Mars Curiosity, which landed in 2012, and are now planning for NASA Mars 2020. He has received four NASA Achievement Awards for work on MCS and on Curiosity.

As part of his Open University work he has been the Nominated Academic for BBC television programmes on weather and planetary science.

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