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Mars Surface Simulations

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Laboratory simulations of the Martian surface are of importance to broaden scientific understanding of the physical processes, but also in order to develop the technology necessary for exploration of the planet. The Mars Simulation Laboratory at Aarhus University [1] has been involved in such simulations for around ten years and has developed several experimental facilities for carrying out science or instrument testing under conditions similar to those at the Martian surface, specifically low pressure, low temperature and importantly recreating the wind flow environment and dust suspension (reproducing the Martian dusty aerosol) using Mars analogue material [2].

The science involved in this simulation work has covered a broad spectrum including, erosion induced mineralogy/chemistry, particulate electrification, magnetic properties of Martian dust, biological survival, UV induced chemistry/mineralogy (using a solar simulator), adhesion/cohesion processes and the wind driven transport of dust and sand [3,4]. With regard to technology the wind tunnel facilities have been used in the development of the latest wind and dust sensing instrumentation [5,6].

With support from the European Space Agency (ESA) and Danish national funding an advanced Mars simulation facility has recently been constructed (2009). This wind tunnel facility has a cross section of 2 x 1 m and a length of 8 m, a temperature range down to below -120C, wind speeds in excess of 20m/s, and automated dust control. With a range of (specialised) sensing instrumentation it provides the opportunity to perform a new generation of scientific experiments and allow testing and technology development in the most realistic and rigorous environment.

As well as being available for the space agencies, this facility will be open to all potential scientific collaborators. Also European planetary scientists may benefit from support through the EU Europlanet FP7 networking programme.

For more information on access possibilities visit the Mars Simulation Laboratory home page: www.marslab.dk.

References:
[1] Merrison, J., et al., (2002) JGR Letters, 107 (E12): Art. No. 5133. [2] P. Nørnberg, et al., (2009) Planet. and Space Sci., 57, 628-631 [3] Merrison, J.P., et al., (2008) Planetary and Space Science, 56, 426-437. [4] Merrison, J.P., et al., (2007) Icarus, 191, 568-580. [5] Holstein-Rathlou, C. et al., (2010) JGR, in press. [6] Merrison, J.P., et al., (2006) Planet. Space Sci. (2006), 54, 1065-1072