

SPACE EXPLORATION SYMPOSIUM (A3)  
Interactive Presentations (IP)

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## EMIRATES MARS MISSION 2020: SCIENCE TARGETS AND OBSERVATIONS

### **Abstract**

The Emirates Mars Mission (EMM) is a United Arab Emirates (UAE) mission to send spacecraft, “Hope” to Mars. The planned launch window opens in the summer of 2020, and the goal is to explore the dynamics of the Martian atmosphere through global spatial sampling which includes both diurnal and seasonal timescales. A particular focus of the mission is the improvement of our understanding of the global circulation in the lower atmosphere and the connections to the upward transport of energy of the escaping atmospheric particles from the upper atmosphere. EMM will be able to take a holistic global picture of Mars at all times of day (diurnally) and at all season (seasonally). The mission focuses on four scientific investigations. The first two investigations focus on the lower atmosphere, where the first is to determine the three-dimensional thermal state of the lower atmosphere and its diurnal variability on sub-seasonal timescales and the second investigation focuses on determining the geographic and diurnal distribution of key constituents (dust, ice cloud, ozone and water vapor) in the lower atmosphere on sub-seasonal timescales. The third investigation focuses on the thermosphere to determine the abundance and spatial variability of key neutral species (H, CO and O). While the fourth scientific investigation focuses on determining the three-dimensional structure and variability of Hydrogen and Oxygen in the exosphere and their variability on sub-seasonal timescales. These investigations will be accomplished using three unique and complementary scientific instruments imaging Mars in Infrared by the Emirates Mars InfraRed Spectrometer (EMIRS) instrument, visible using the multi-band imager Emirates eXploration Imager (EXI) instrument, and UV using the Emirates Mars Ultraviolet Spectrometer (EMUS) instrument ranges. The presentation will also be highlighting the different observation strategies of the instruments.