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Mineralogy of high latitudes of Mars

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The northern and southern high latitude regions of Mars have had a complex geologic history. Although they are some of the youngest units on Mars little is known about their composition, formation and deposition. Neutron data acquired using the Neutron Spectrometer aboard 2001 Mars Odyssey indicates hydrogen-rich layers ($<$1 meter) ranging up to 100% water-equivalent by mass are found at latitudes higher than 50-60° latitude. More recently, sedimentary minerals have been detected by ESA/MEx/OMEGA in some parts of the circumpolar dunes. The Mars Express satellite in operation since the beginning of 2004 allowed for the generation of nearly complete survey OMEGA mosaics of the northern and southern high latitude regions. The surface composition of these regions will be discussed. Of special interest is the detection of hydrated material in the terrains surrounding the polar residual cap, as inferred from the depth of the 1.9 μm absorption band. Small water ice deposits are also observed throughout the northern plains at latitudes quite distant from the residual polar cap. OMEGA also acquires spectral information of the NASA/PHOENIX landing site, which will be discussed.