THE ACTIVITIES OF THE IBN BATTUTA CENTRE (MOROCCO) AND THE SAHARA AS LARGE-SCALE MARS ANALOGUE. G. G. Ori 1, 2, I. Dell’Arciprete 2 and K. Taj-Eddine 2, 3. 1 IRSPS, Universita’ d’Annunzio (Viale Pindaro 42, 65127 Pescara, Italy, ggori@irsps.unich.it), 2 Ibn Battuta Centre, Universite Cadi Ayyad, Marrakech, Morocco, 3 Faculte de Sciences, Universite Cadi Ayyad, Marrakech, Morocco

Introduction: The Ibn Battuta Centre for exploration and field activities was established in 2006 by the International Research School of Planetary Sciences (Pescara, Italy) to prepare and execute tests of rovers, landing systems, instruments and operations related to the exploration of Mars and Moon. The Centre has a major partner, the Universite’ Cadi Ayyad of Marrakech (Morocco) where it is located. The Centre is named after the famous Moroccan explorer Ibn Battuta (born in Tangier on 24th February 1304 – 703 Hijra) who explored a large part of Northern Africa and Asia. During his travels Ibn Battuta visited almost the entire Muslim world and travelled more than 120,000 kilometres.

The activities: The Ibn Battuta Centre (www.ibnbattutacentre.org) deals with both scientific and operational analogues. In both case it take advantage of the long geological history of Morocco and the remarkable geological and geomorphological diversity. Quaternary environments are a host of morphologies and geological settings similar to Mars from reg surfaces to dry lakes, from aeolian dunes to bio-induced carbonates. Besides these quaternary environments, several sites of the Centre consist of ancient deposits such as the Devonian Mud Mounds of the Kess Kess or the Precambrian stromatolites near Ouarazzate. The Centre is part of the Europlanet Research Infrastructure of the EU. Under this frame about 15 scientists have been able to obtain grants to carry on field work in Ibn Battuta field sites. Several other activities deal with space missions or future exploration scenarios. For example at the field site of Merzuga the test of the dust probe on board the lander of the ExoMars 2016 mission is underway. The Centre is involved also in other tests related with the ExoMars missions to Mars. In 2013 the Centre has organized and financed the activities of the Austrian Space Forum dealing with a large, one month long, test of human explorations.

Sahara and Mars: Sahara has experienced during its long geological history a large number of climatic changes from humid conditions (with savanna-type environments) to dry conditions (with hot desert environments). Therefore since the late Miocene Sahara alternated periods with rivers, lakes, deltas swamps with periods with a strong aeolian activity and the formation of deflation surface and sand seas.
other adjacent continents (mostly Europe and South America) and oceans.

The results of these climatic changes are fluvial systems and lacustrine deposits interrelated with deflation surfaces and sand accumulations. This situation is similar to Mars where fluvial deposits and morphologies abound but are largely eroded. When deposits are present are basically coarse-grained (e.g. the meandering channels of the Eberswakde deltaic plain) because the long lasting aeolian. This has removed the finer portion of the sediment and accumulated the sand to silt grade portion in sand seas and sheets and the fines in a sort of draping dust.

**Conclusions:** The Sahara being the largest and (probably) oldest desert in the World provide the amazing opportunity to see in action the processes that shaped the present day surface of Mars.

The Ibn battuta Centre is deeply involved in the Mars analogue activities. The Ibn Battuta take advantage of the Sahara environment that has been shaped by sedimentary processes that are partially similar to those active on Mars. Moreover, the large geological variability of its history of its past is testified by a number of geological and astrobiological targets of Mars analogue missions. The field sites of the Centre are feasible for large-scale tests of operations due to the broadness of the desert landscape and the easy logistic. The sites are in touristic places with a number of Hotels. Airports are within 20 - 50 km from the sites and there is an entire industry in field logistic due to the Studios that shoot almost the totality of the movies with arid landscapes.