A FACILITY OF THE AGENZIA SPAZIALE ITALIANA TO TEST OPERATIONS, INSTRUMENTS AND LANDING SYSTEMS FOR MARS EXPLORATION: THE PLANLAB PROJECT OF THE IBN BATTUTA CENTRE AT MARRAKECH (MOROCCO). G.G. Ori[12], E. Flamini [3], I. Dell'Arciprete[2], and K. Taj-Eddine[2], [1]IRSPS, Universita' d'Annunzio, Pescara, Italy, (ggori@irsps.unich.it), [2]Ibn Battuta Centre, Universite Cady Ayyad, Marrakech, Morocco, [3]Agenzia Spaziale Italiana, Roma, Italy

Introduction: The Agenzia Spaziale Italiana (ASI) in collaboration with the IRSPS (at Pescara, Italy) has started a programme (PLANLAB: Planetary Analogue Laboratory) to prepare and execute tests of rovers, landing systems, instruments and operations related to the exploration of Mars and in general to the in-situ exploration of the Solar System bodies. To perform these activities the IRSPS as set a centre in Marrakech called Ibn Battuta Centre. The Centre will use the large geological variabilità of the Maroccan Sahara to test the European instruments, and rovere devoted to the planetary exploration. Besided this technological approach, the centre will develop also the scientific analysis of the Martian analogues Sahara and overseas. 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 main aim of the Ibn Battuta Centre is to develop tests for the Martian and planetary exploration. However, it may appliy concepts and knowledge ato the exploration (even human) of the Moon. In additino, the Centre it is organising several activities such as field courses for students and professionals, summer schools, field trips and expeditions. These activities are linked to the research on terrestrial analogues of Mars and to the geological sciences. The Centre is strongly based on the field activity and devoted to the scientific studies and applications in planetology and geology.

Fig. 1 Regs and ergs in the Moroccan Sahara.

Three kind of tests are considered: 1) tests involving the operation of rovers on the Martian surface in order to understand the how to control and plan both the guidance and scientific activities, 2) test of instruments and subsystems, 3) test of landing gear and operations. The nature of the Moroccan desert with its empty spaces and broad and open landscape is perfect for mimic the nature of the Martian surface. Operators will have to face the same environmental conditions: not many reference point in the panorama, flat and slightly corrugated surface, different kind of environments, dust and dry, etc. Currently, the Ibn Battuta Centre is organising the logistic and the basic science for the test of the precirion landing system carried out by Gavazzi Space under ESA contract. The experiment will consist of a two meter long unmanned helicopter that will fly at about 3000 m of altitude and will descend at several 10s of meter per second in order to simulate the landing of a spacecraft on a planetary surface. In order to identifie the best test site, several locations have been investigated and one site has been selected near Ourzazate south of the Sahara. The experiment is scheduled in 2009.

Fig. 1 Evaporitic (sulphate) sabkha in the Western Sahara .

The Ibn Battuta Centre is working in several environments in Sahara and the Atlas mountains including regs, eolian dunes, evaporitic sulphate deposits, basaltic baleaux, etc. The Moroccan geology offer a large variability of settings. Besides these sites and other sites in Northern Africa in Tunisia, Algeria and Egypt, the Centre is also invoved in field activities in Patagonia, Gobi desert, Svalbard, Greenland, etc.