Screens as light biological variable in Microgravitational Space Environment.

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Foreword

The ability of the biological organisms to orient themselves and to synchronize on the variations of the solar rhythms is a fundamental aspect in the planning of the human habitat, above all when habitat is confined in the Space, the planetary and in satellite outer space settlements. In order to simulate the experience of the astronauts in long duration missions, one of the dominant characteristics of the Space confined habitats is the absence of the earthlings solar cycles references. The Sun is the main references and guidelines of the "biological compass and timepiece". The organism functions are influenced from the variation of the light in the round of the 24 hours: the human "circadian rhythms".

In these habitats it is therefore necessary to reproduce the color and intensity of the solar light variations along the arc of the day, according to defined scientific programs, assuring a better performance of the human organism.

0.0.1 Multilayer Foldable Screens as biological environmental variable

In the project, "Multilayer Foldable Screens" are the monitors posed in the "ceiling" of an Outer Space habitat and are made of liquid crystals and covered with Kevlar, they stand for a modulate and flexible structure for different arrangements and different visions. Screens works on all the solar light frequencies and display the images that the subject needs. They are characterized from the emission of an environmental light that restores the earthly solar cycle for intensity and color temperature, to irradiate the subject with the same frequency beams present on the Earth, concurring to maintain factors like the perception of passing of time, the regulation of the biological clock and the hormonal production. Beyond that the light UV rays cooperate to the production of the D vitamin, very important for the astronauts to reduce the risk of osteoporosis. The monitors form a gleaming roof simulating a cupola of transparent glass that shows the open sky. Another quality of the monitor is the opportunity to project every thing, from the land to the sky, to videoconference. The absent or abnormal natural light, the isolation in the confined space and from the earthling natural

biological inputs creates unavoidable changes of the psycho-physiological conditions of the astronaut. An artificial environment without variety and variability may takes to strong physiological-physiological consequences like the depression, while artificial environmental stimulations like the light, the colors, the variations of the air, the wind, the warmth, the cold, the scent, the flavors, normally present on Earth, can activate implicit vital mechanisms

Moreover variable lighting recalling the natural light effects in the course of a whole day, through automatic changes in intensity, direction, brightness and predominant wavelength. It creates space, provides a sense of time passing, and varies colors perception. It includes the positive part of the ultraviolet beams, so as to make crew to benefit from the exposure to the solar light: in particular the lessening of viruses in the air. It is placed “on top” increasing up and down orientation, and it has adjustable intensity.