EXPLORATION OF THE MOON BETWEEN COMMUNICATION AND SCIENCE B. Ambrosio[1], [1]INAF-OAPD (biagio.ambrosio@inaf.it)

Introduction: In a world in which new media foster the availability of information and the diffusion of scientific contents, the Third Mission plays a main role: making up and promoting a *dialectic of science*, spreading science contents by the media that modern technologies provide, involving the public in research activity are crucial goals for the scientific community at present day. In the history of space explorations, the Moon was the goal that captured the attention of the public much more than anyone else. Artemis program is expected to follow the same path in the next years and resources that public and private agencies are spending in space missions suggest that we find ourselves at the dawn of a new *space race* that will have the Moon as the first goal. Thus, the exploration of the Moon is the perfect scope for a methodological investigation about new communication strategies to use in the public outreach field. Moreover, the Moon is expected to be the next setting for scientific research about life in universe: studying life under extreme condition is one of the scientific perspectives of the Artemis program, while ESA EL3 is expected to bring on the Moon experiments to expand the results of the EXPOSE program. My research consists in exploiting the potential of virtual reality for the dissemination of scientific contents, building up a product that results experienceable, interactive, effective, and challenging for users. This product consists in a Virtual Reality experience, that is made with Unity and run on a Meta Quest 2 device. The VR experience allows the user to walk on the Moon surface(Figure 1), drive a lunar vehicle to reach the farthest checkpoints, interact with objects in the lunar environment with its characteristics, like unusual gravity and lack of air friction. The experience has the structure of a game since modern studies shows that gamification has a great potential in science dissemination to the public[1] . The tasks deal with the solution of simple problems connected to the science that we are going to do on the Moon: microorganisms' culture, fungal spores biomining, in situ resources utilization. Living this kind of experience, the user feels the aims of science as something personal, concrete, exciting and worth achieving[2]: this is an emotionally effective science communication. On the other hand, in the future, this VR experience could constitute a precious support also for scientists, making them more familiar with the environment of their research, showing a wide context for data interpretation and future mission design. Therefore, the final goal of this project is to modernize science communication from both sides, developing an innovative product that can reduce the distance between public and scientists and, in the meanwhile, give support to scientists in their research activity, in a sector of space science that will become crucial in the next years.

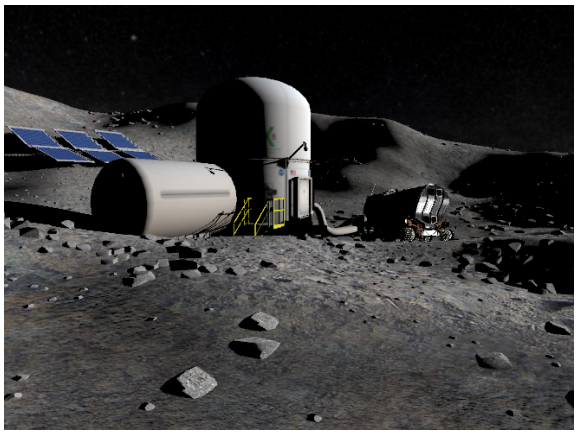

Figure 1: Player view of the virtual environment

References:

[1] Kalogiannakis M. et al. (2021) *Educ. Sci., 11,* 1. https://doi.org/10.3390/educsci11010022

[2] Anolli L. and Mantovani F. *Come funziona la nostra mente* (2011)