

APOLLO MEMORIAL YEAR FOR THE PLANETARY SCIENCE EDUCATION - REAL AND VR EXHIBITION

Pál Gábor VIZI¹, Szaniszló BÉRCZI²,

¹Wigner Research Center for Physics, Konkoly str. 29-33. H-1121 BUDAPEST, Hungary vizi.pal.gabor@wigner.hu;

²Eötvös University, Faculty of Science, Dept. of Materials Physics, Cosmic Materials Space Res. Group, 1117 Budapest, Pázmány P. s. 1/a. Hungary, (bercziszani@caesar.elte.hu)

Introduction: 2019 was the 'Apollo 50' memorial year of the first manned mission to the Moon. The 50th anniversary of the Apollo 11 mission provided a good possibility to show the public the heroic effort and the success of the Apollo Missions. We organized a small exhibition in a conventional 'Reality' form together with a 'Virtual Reality' VR extension.

The background: The CsoPa Science Center, Budapest, Hungary [1] provided exhibition place for Apollo 50. The Wigner Research Centre for Physics [2] decided to enhance their exhibition field in CsoPa and its Communication Secretariat and Department of Space Physics and Technology supported the ingredients.

The authors of this paper collected several models and wrote articles and papers about Apollo 11. [3][4][5] We have found and obtained some models about the program.

Apollo 11 Columbia and Eagle module arrived from estate of NASA MSFC retired engineer, Huntsville in a very good state. We collected Saturn V models in different sizes and some Eagle models too.

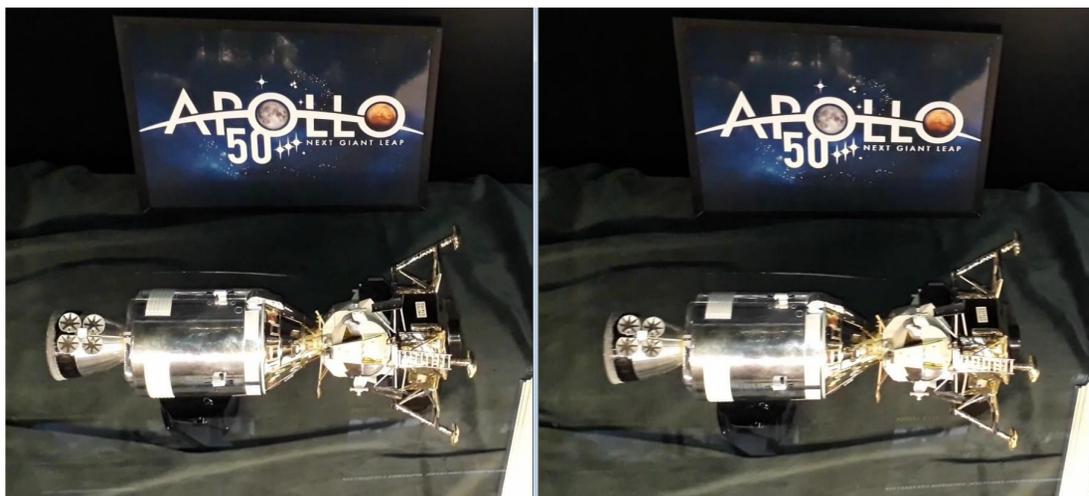
The exhibition: We designed standing and landscape showcases first in virtually and after built them. The Virtual Reality computer went into the bottom of the standing showcase. We put the short history of the flight onto six tables on the wall. We collected the best available free NASA HiRes videos from video portals and put them in two monitors on top of the walls.

A small science background is visible in the landscape showcase which one of our last LPSC papers, the 'Planetary Science Education II: Studies of the NASA Lunar Sample Set Using the Arrangement of the Measurements in a System of Structural Hierarchy of Materials' [3]

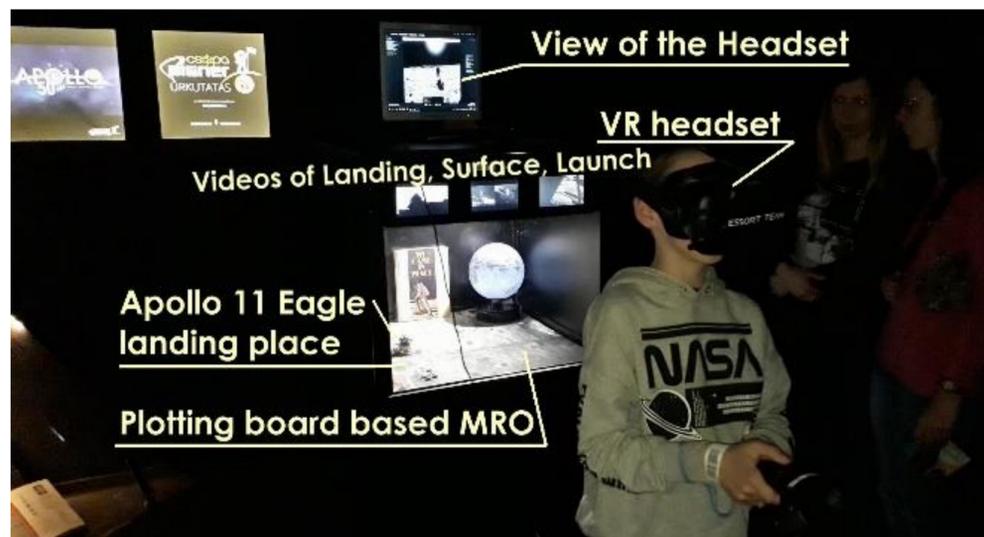
Virtual Reality VR: We used two types of VR. To design the detailed plan of the exhibition place we used Google Sketchup 3D designer. To start from Earth, to walk on the Moon near to Eagle and to arrive back to Earth we bought the Steam VR with Apollo 11 HD. The necessary hardware were provided by the Essort Team, Budapest, Hungary, a company which is a Virtual Reality (VR) expert which also sponsored the show.



The design of the exhibition. Cross eyed stereo version of the exhibition plan.



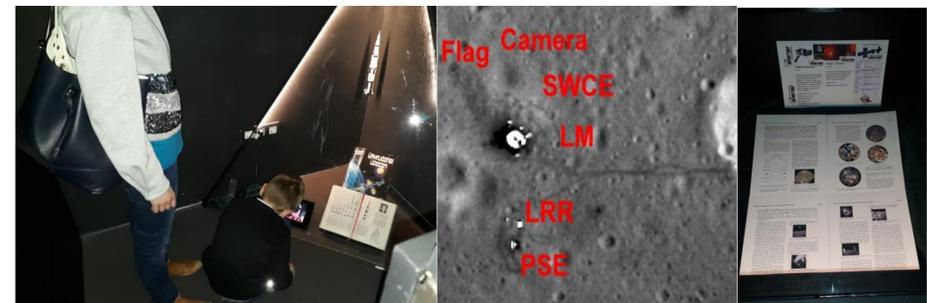
Cross eyed stereo picture about model of Apollo 11 Columbia Command Module and Eagle Lunar Module from estate of NASA MSFC retired engineer, Huntsville



Kids in the VR moon walking near to Eagle.

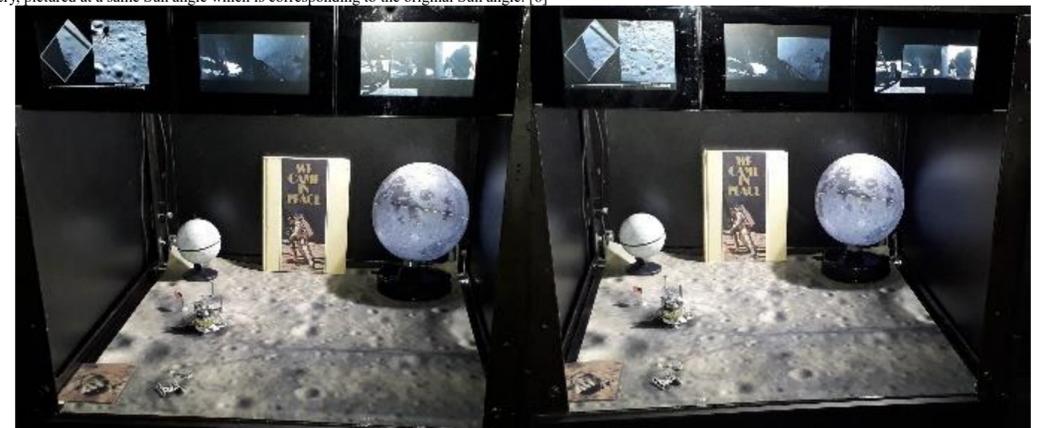
The real part: We printed our paper and put in the landscape showcase together with the Apollo 11 Columbia - Eagle complex 1/48 model. We use several Original copies of the Astronautics Lexicon opened at the actual pages as a description of the models and the story. The goal is to popularize the Lexicon itself also.

We use small digital photo frames to show the connected significant video of the presented object. When the exhibition is opening at morning and the frames get power, its start automatically to play the videos.



Interesting little boy; LRO image of landing site and Planetary Science Education II: Studies of the NASA Lunar Sample Set Using the Arrangement of the Measurements in a System of Structural Hierarchy of Materials' [3]

The standing showcase with the plotting board of the landing place of the Eagle with the model of the Lunar Module, the American Flag, the Television Camera, the Solar Wind Composition Experiment (SWCE), the Passive Seismic Experiment (PSE, with the Lunar Dust Detector), detected lunar "moonquakes" and provided information about the internal structure of the Moon; and the Laser Ranging Retroreflector (LRR). The plotting board picture comes from Lunar Reconnaissance Orbiter (LRO) - NASA imagery, pictured at a same Sun angle which is corresponding to the original Sun angle. [6]

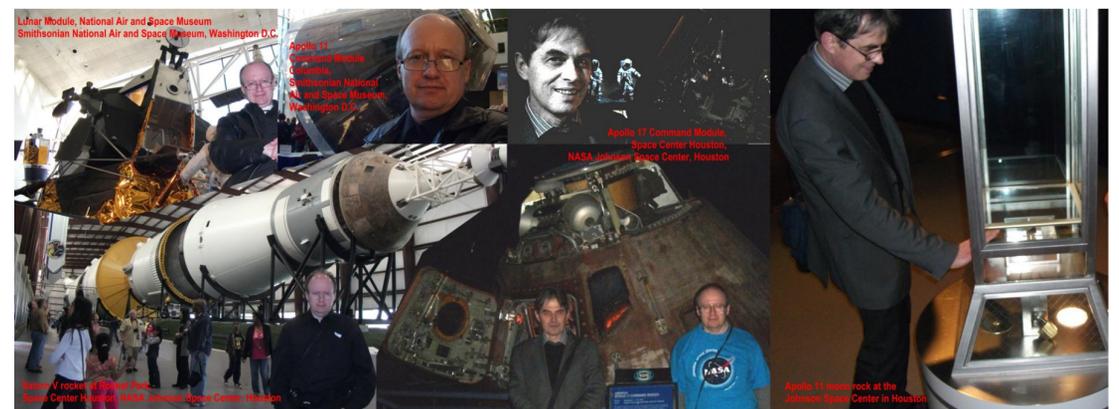


The cross eyed 3D version of the standing showcase.



The finished structure of the presentation in CsoPa.

Conclusion: The memorial exhibition of the Wigner Research Centre for Physics, in Budapest on Apollo' 50 was an extended education and outreach representation of the main space science event of the 20th century. Over the regular possibilities of the open lectures about the NASA lunar samples at the Eötvös University, and the memorial exhibition of lunar meteorites in the Natural History Museum of Budapest, the wide audience could find various contacts with the lunar landing events 50 years ago, in attractive forms. It is also worthy to mention the memorial lecture conference of the Hungarian Astronautical Society (MANT) on the Apollo 50' event, in July, 2019.



Authors at Apollo museums in Houston and Washington to study Apollo exhibitions and implement the experience at Budapest, Hungary

References: [1] CsoPa Science Center <https://www.csopa.hu/en/> [2] Wigner Research Centre for Physics <https://wigner.mta.hu/en/> [3] Bérczi et al: Planetary Science Education II: Studies of the NASA Lunar Sample Set Using the Arrangement of the Measurements in a System of Structural Hierarchy of Materials, LPSC49 #2427 <https://www.hou.usra.edu/meetings/lpsc2018/pdf/2427.pdf> [4] The Role of Makerspace in Space Science Education: How Learning and Space Technology Forms an Attractive Curriculum for Creation in Digital Community, LPSC50 #1899 <https://www.hou.usra.edu/meetings/lpsc2019/pdf/1899.pdf> [5] 2018 December - 2019 December: An Apollo Memorial Year for the Planetary Science Education, LPSC50 #1813 <https://www.hou.usra.edu/meetings/lpsc2019/pdf/1813.pdf> [6] LRO Explores the Apollo 11 Landing Site <https://moon.nasa.gov/resources/128/lro-explores-the-apollo-11-landing-site>