

MIDI 2022 Special Opening Discussion Session on

Challenges and opportunities in Space Exploration using eXtended Reality

*With panellists from **European Space Agency (ESA) European Astronaut Center, ESA Topical Team Space Analogs and Human Performance, Polish Space Agency (POLSA), Space Research Center Polish Academy of Sciences (CBK PAN), Polish Ministry of Education and Science, XR Center Polish-Japanese Academy of Information Technology (XRC PJAIT) and collaborating labs from HASE (Human Aspects in Science and Engineering) research initiative, including LIT NIPI, VR Lab Institute of Psychology PAS and EC Lab SWPS University.***

List of the Panellists:

European Space Agency, European Astronaut Center (ESA EAC)

Lionel Ferra, Head of XR-Lab

Tommy Nilsson, PhD, Research fellow at XR-Lab

ESA Topical Team Space Analogs and Human Performance

prof. **Gabriel G. De la Torre**, PhD, University of Cadiz, Spain

Ministry of Education and Science, PB-HME:

Agnieszka Kuczała, Ph.D., a representative of the Polish Ministry of Education and Science to the PB-HME (ESA Programme Board for Human Spaceflight, Microgravity and Exploration)

Polish Space Agency (POLSA):

Prof. **Grzegorz Wrochna**, Ph.D., President of POLSA

Space Research Center, Polish Academy of Sciences (CBK PAN)

prof. **Marek Banaszkiwicz**, Ph.D., head of Satellite Manipulator Dynamics Lab, Zielona Góra

ALPHA-XR programme core member lab heads:

Polish-Japanese Academy of Information Technology,

Wiesław Kopec, Ph.D.,

Head of XR Department of the Faculty of IT and Head XR Center and XR Lab

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Cezary Biele, Ph.D.

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Grzegorz Pochwatko, Ph.D.

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Deputy Director of the Institute of Psychology, Head of Emotion Cognition Lab

Abstract:

Space exploration is currently one of the most challenging and exciting areas of research. It is also one of the pillars of European strategic fields reflected in e.g. ESA areas of research besides earth observation. It has been ten years since Poland joined ESA. In this time new technologies like Augmented and Virtual Reality (AR, VR) that comprise the eXtended Reality (XR) continuum emerged and developed. During our special opening session we will discuss opportunities and challenges of applying XR-based research in Space Exploration. These span astronaut training, mitigating the cognitive effects of long term ICE conditions (isolation, confinement and extreme), but also just-in-time learning. These areas were recently signalled in our recent joint exploratory research of using XR in ICE conditions within the ALPHA-XR framework initiated by XR Lab PJAiT. It is situated in the broader context of HASE research initiative (Human Aspects in Science and Engineering) which brings together advanced labs in the human-computer interaction research field, including XR Lab PJAiT, VR Lab IP PAS, LIT OPI and EC Lab USWPS. Combining XR tools with objective psychophysiological measurements is a promising path in space exploration research as well as for applications in isolation conditions both in space and here on Earth.

Further details on <https://alpha.xrlab.pl/>