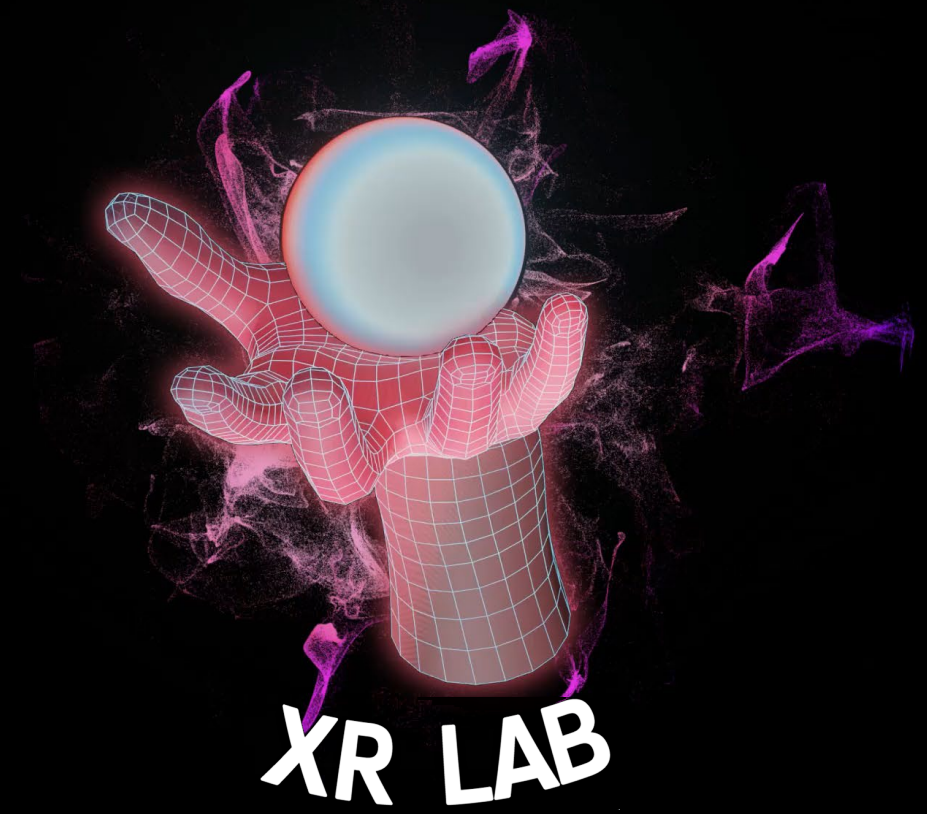
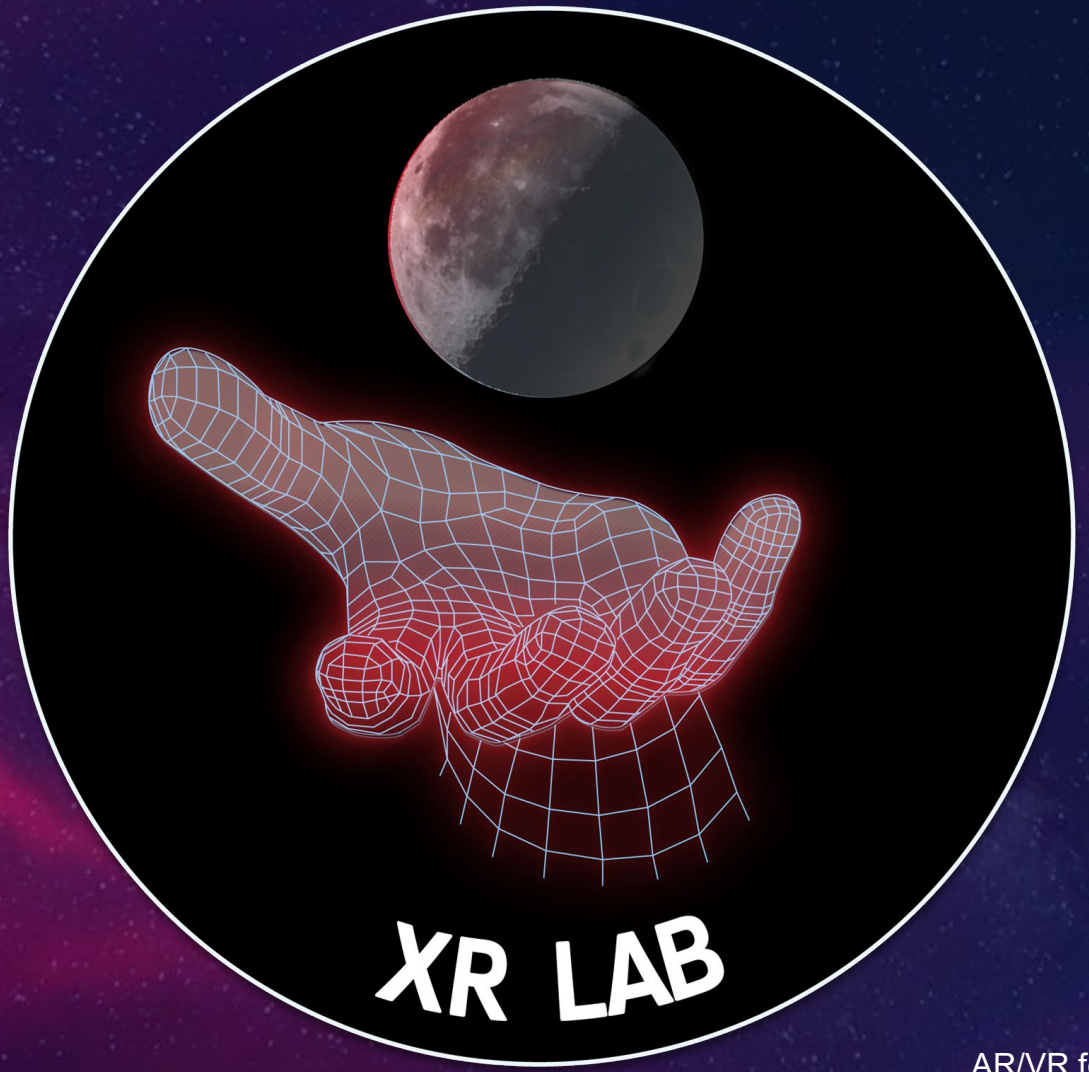

XR LAB

Assisting engineering, training and operations for human spaceflight applications using eXtended Reality (XR) technologies

XR LAB



11/12/2023

AR/VR for Space Programmes workshop, ESA/ESTEC

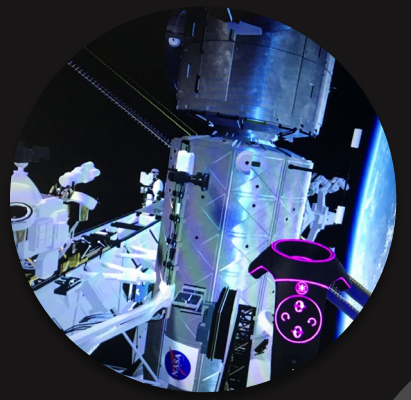
L. Ferra, M. Costantini, F. Saling, A Treuer, W. Sadri, L. Bensch, F. Dufresne, T. Nilsson, A. E. M. Casini

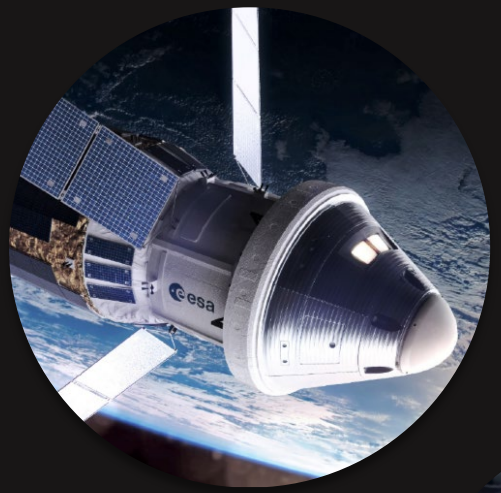
ESA UNCLASSIFIED - For ESA Official Use Only

The Team

The Team

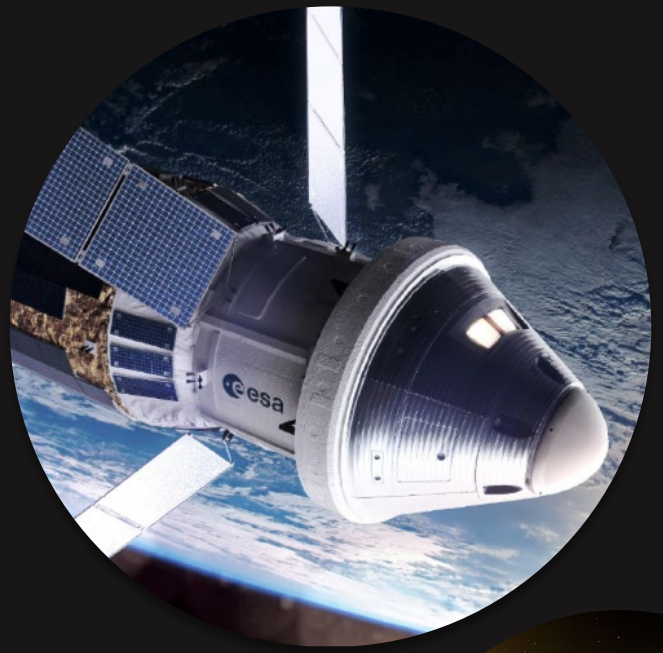
EAC XR Lab / What we do

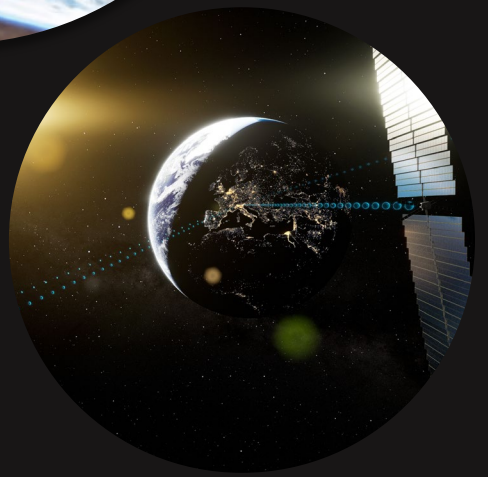


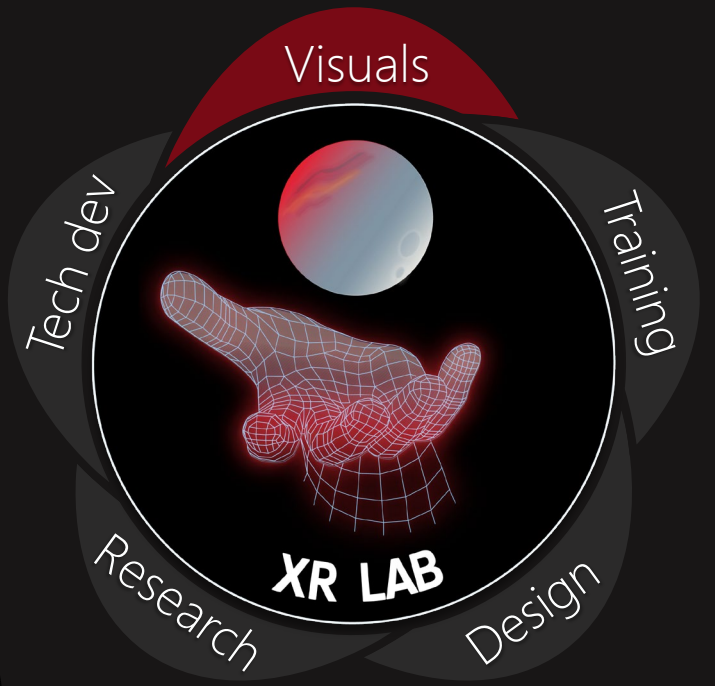


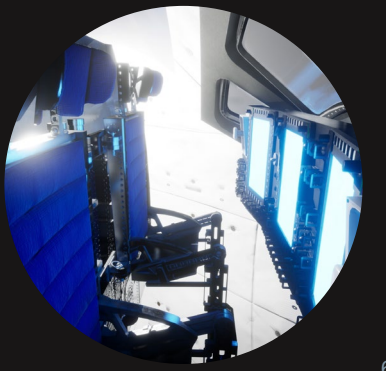
Credits: ESA/Space Applications Services

EAC XR Lab / What we do









EAC XR Lab / What we do

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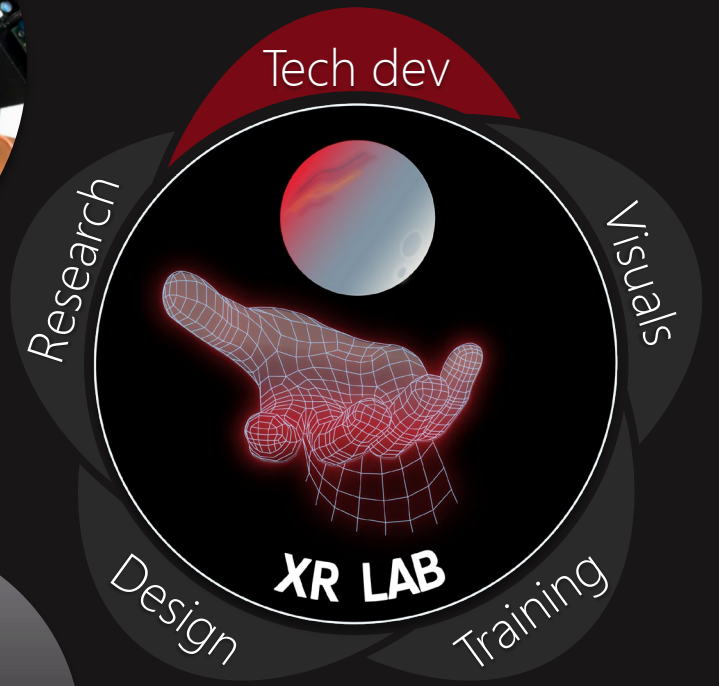
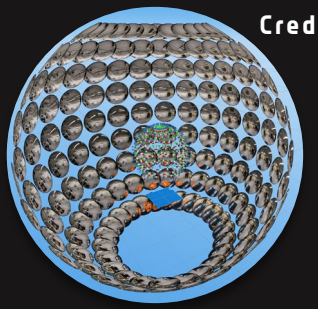
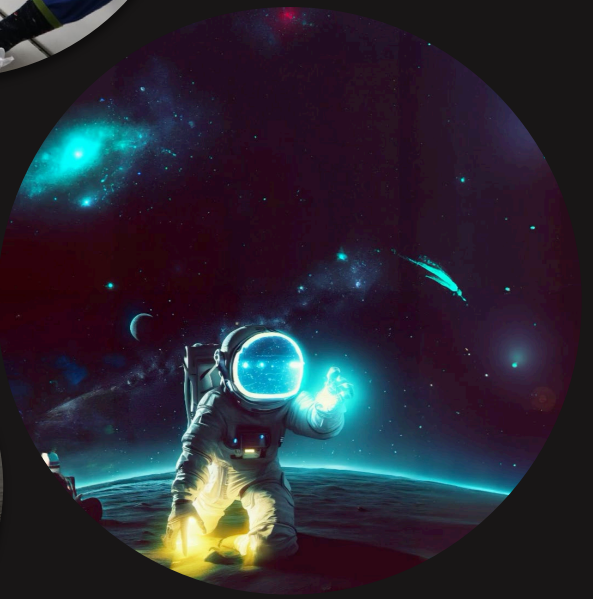


EAC XR Lab / What we do

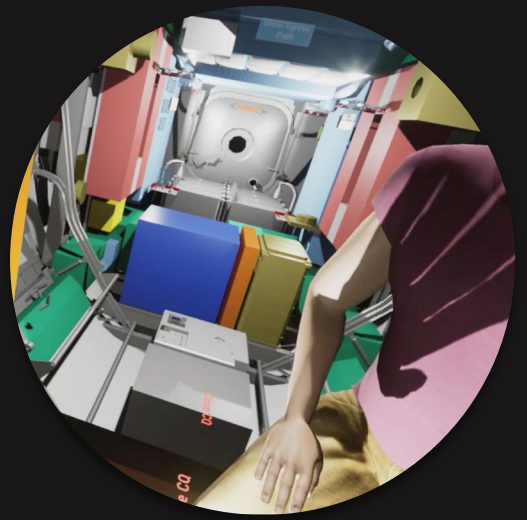


Credits: ESA/VTT



Credits: ESA/TU Würzburg

EAC XR Lab / What we do



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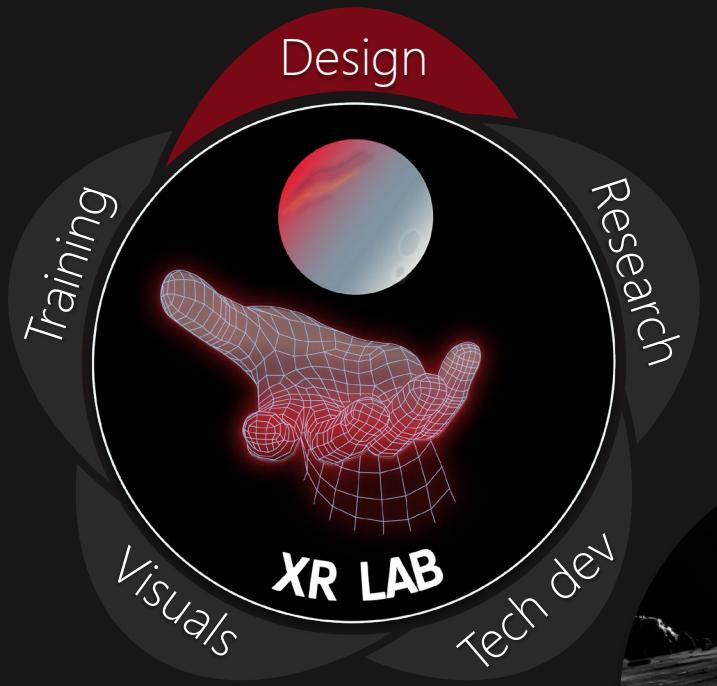
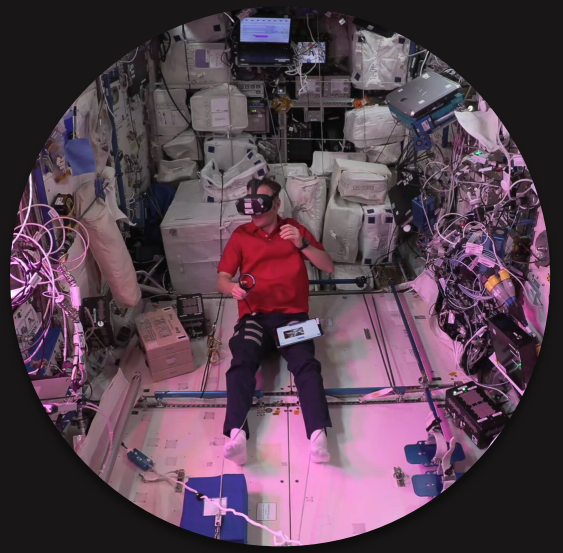
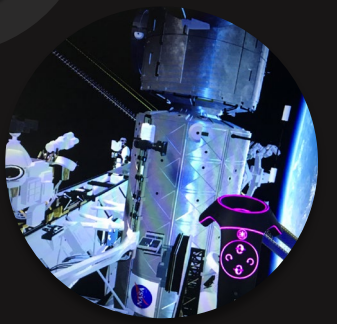


EAC XR Lab / What we do

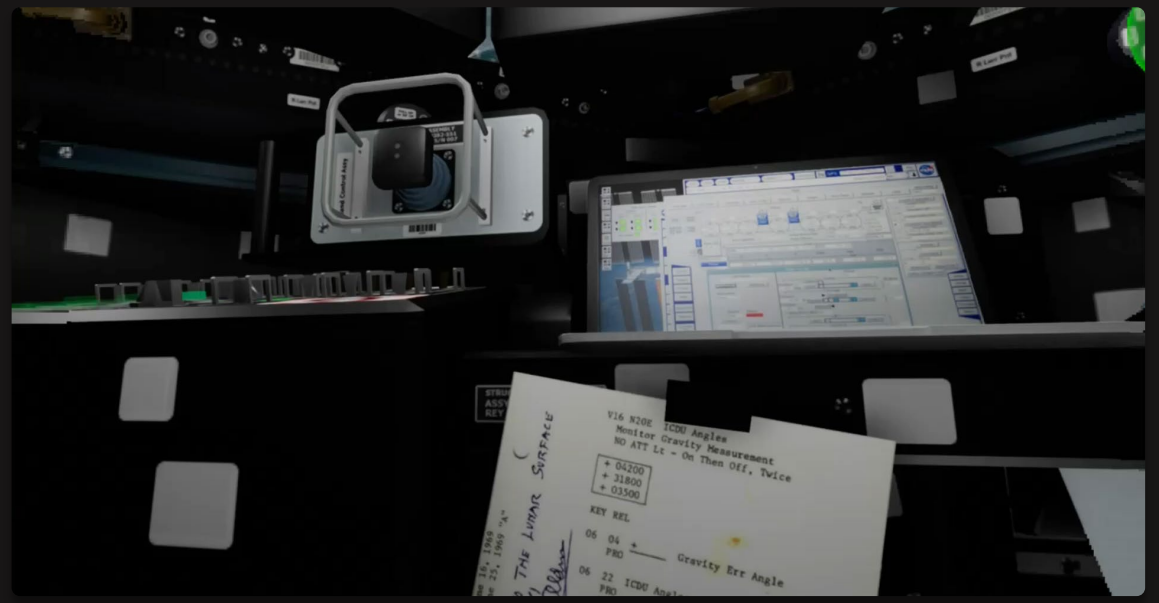
Credits: ESA/Pale Blue

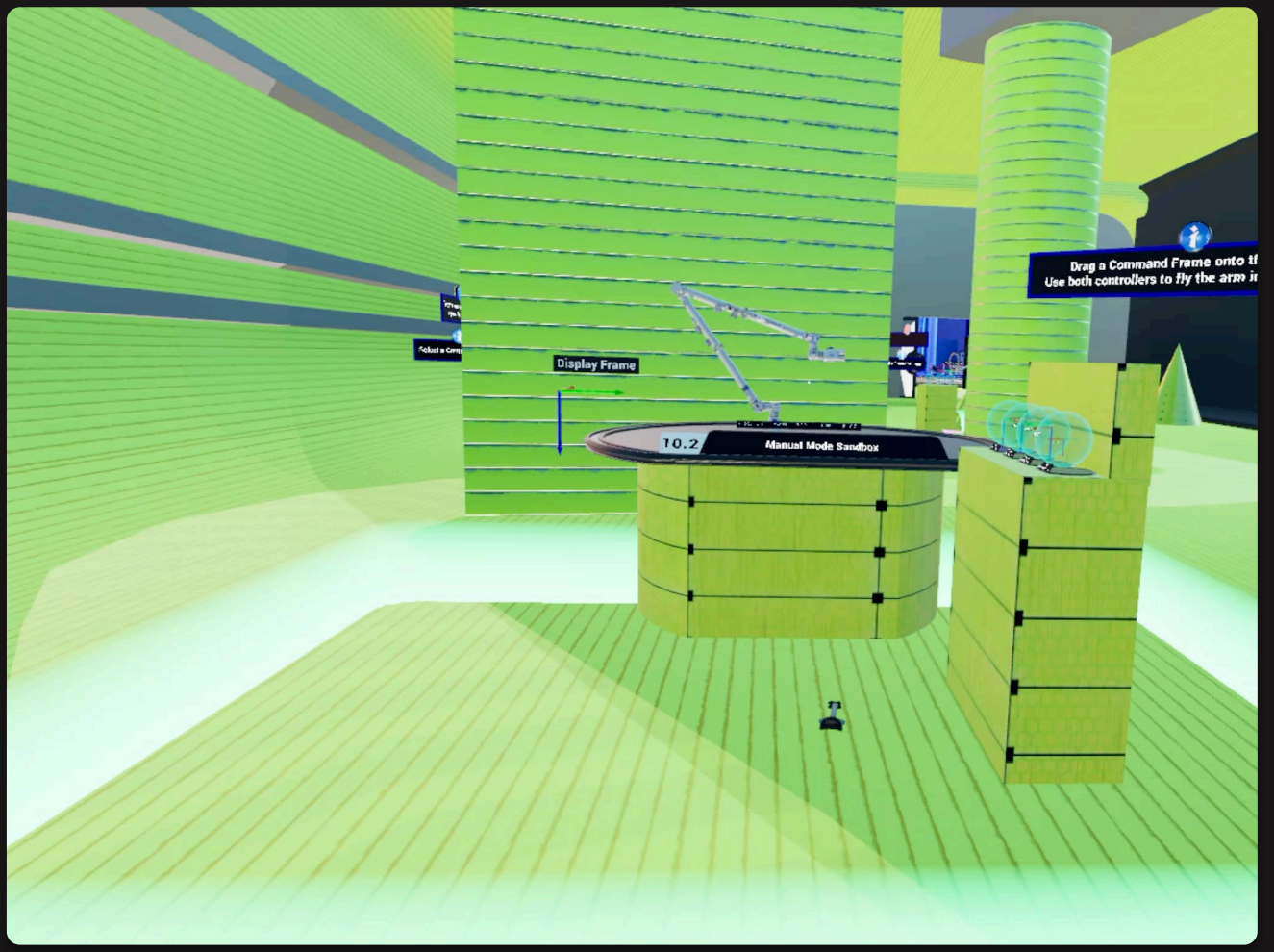
Credits: ESA/Mediuis/AnatomyX®





JIVE Robotics Training & ISS Familiarization

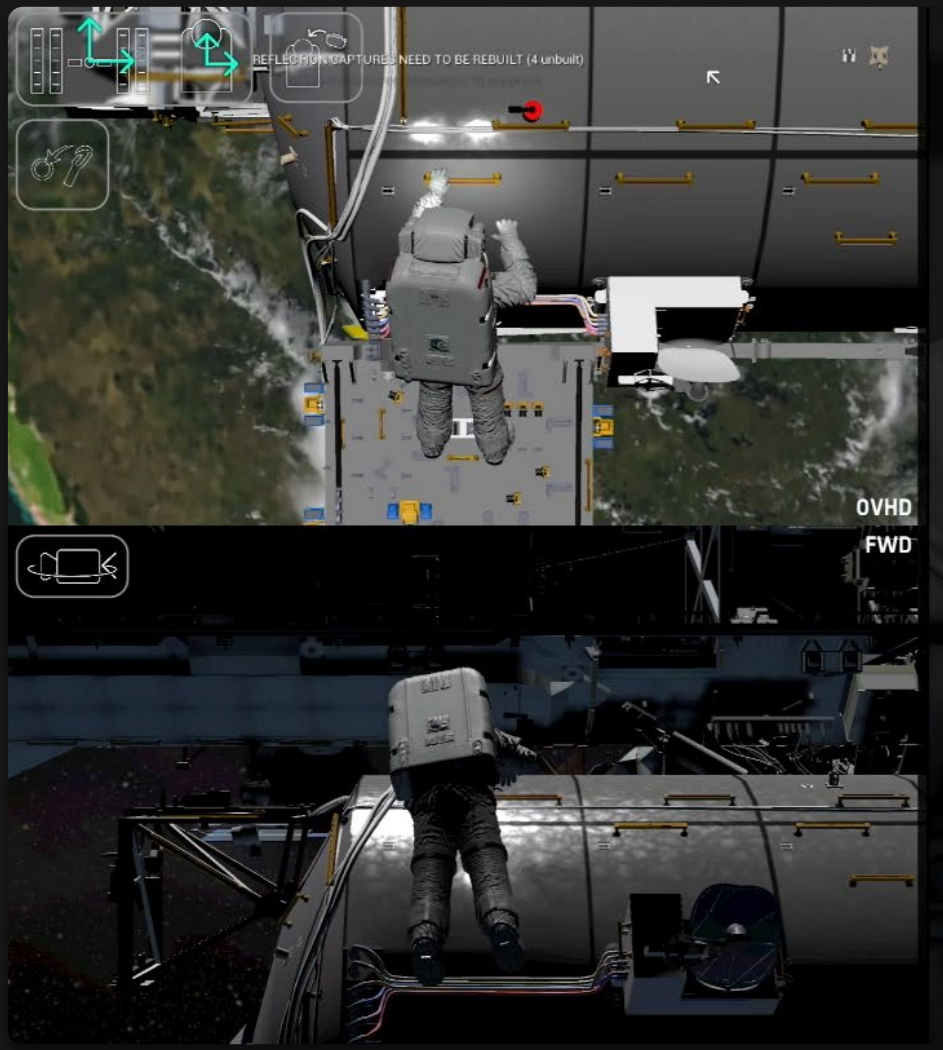




- Developed in-house in consultation with NASA
- Currently used for Astronaut Basic Training at EAC and at NASA JSC
- Use of gaming paradigms coupled with VR and MR techniques

VREVA – EVA trainer

- Developed in-house
- Currently used for Astronaut Basic Training at EAC
- Used in coordination with pool runs



MARA – Medical assistance AR

- Developing a augmented reality tool to aid astronaut on the ISS or beyond (Moon)
- HoloLens 2 device for prototype
- Medical procedures (ECG, non-invasive blood pressure, oximeter)
- Mathematical calculation to draw the position of the electrodes

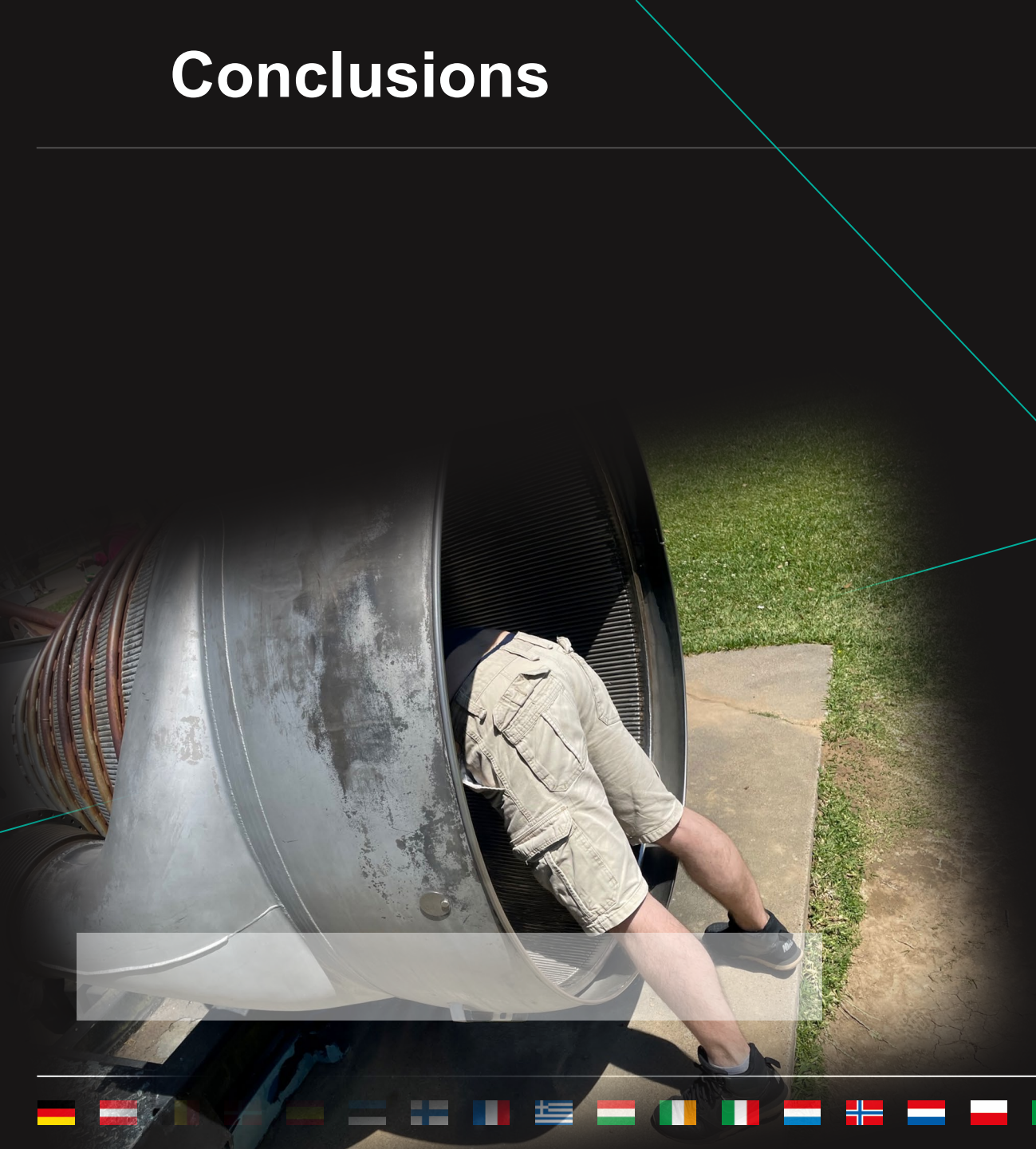
VORTEX – Moon sandbox

- Realistic representation of the lunar surface (NASA LRO DEMs and JPL ephmeris)
- Testing environment for hardware design, ergonomics assessments and concept of operations rehearsal
- Potential use as training tool for future lunar missions

Overview

Domains	Earth	ISS	Lunar Gateway	Moon Surface	Mars
Training	PANGAEA	GRAVI-T (JIVE) V0GUE (PaleBlue) Anatomy Trg AR VREVA VR-OBT			MSR (VR2Planets)
Design support	LUNA VR		GRAVITAS Gateway4U (TAS)	VORTEX PROSPECT	
Operations support	LUNA XR			PROSPECT	MSR (VR2Planets)
Medical support		MARA	MARA		
PR	LUNA MR	GAMESCOM		VORTEX	MSR (VR2Planets)
Technological demonstrators	VR underwater (TU Würzburg), Audiosensory feedback (TU Ilmenau), CCTV Digital twin (TU Ilmenau), VaRIaS (Misterine), Sparkles/Fortnite (EPIC Games), 0G HMD (ESA)				

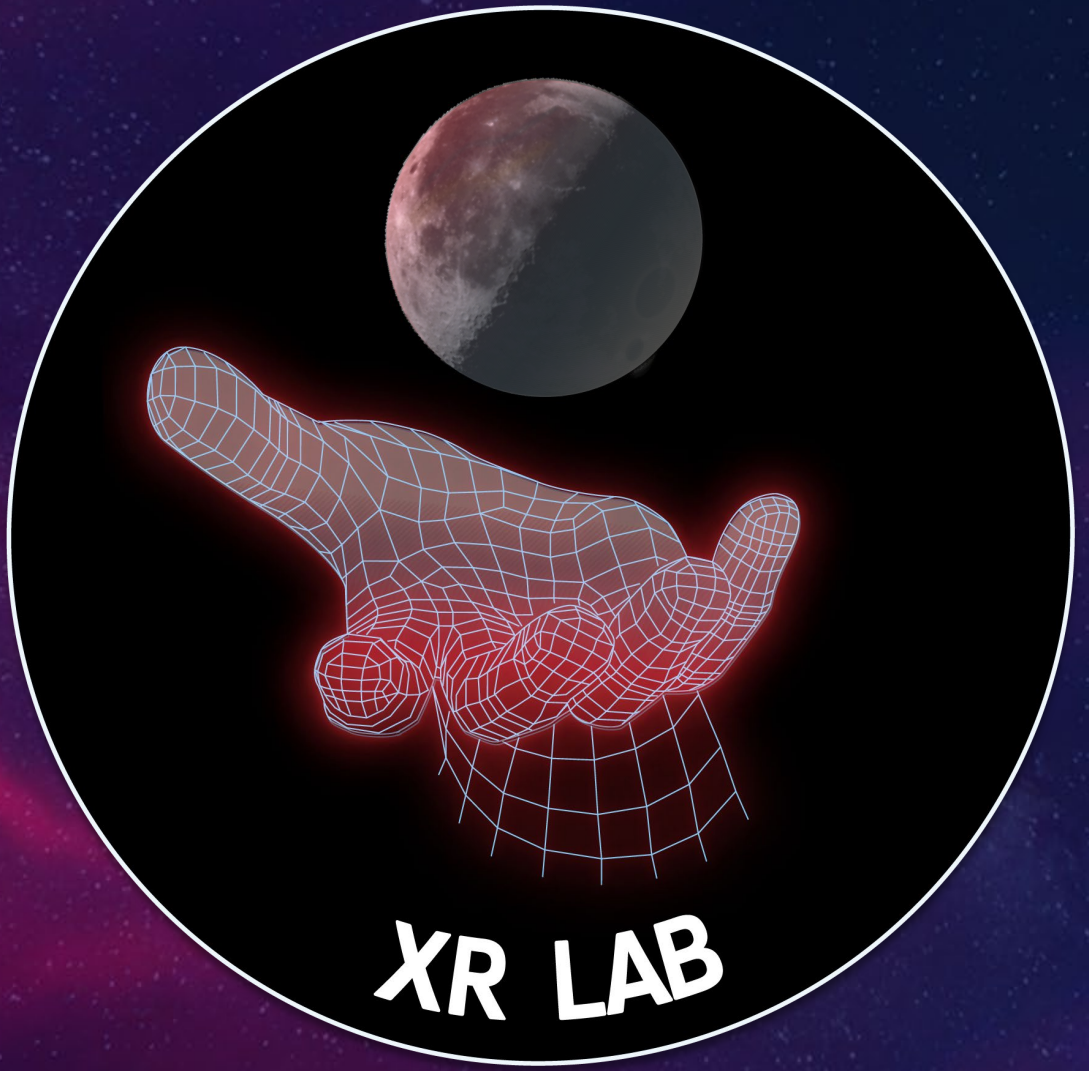
Conclusions



THANKS FOR YOUR ATTENTION!

esa

XR LAB



Do you want to know the latest XR Lab updates?

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https://www.esa.int/About_Us/EAC/Exploring_new_realities_ESA_s_XR_lab