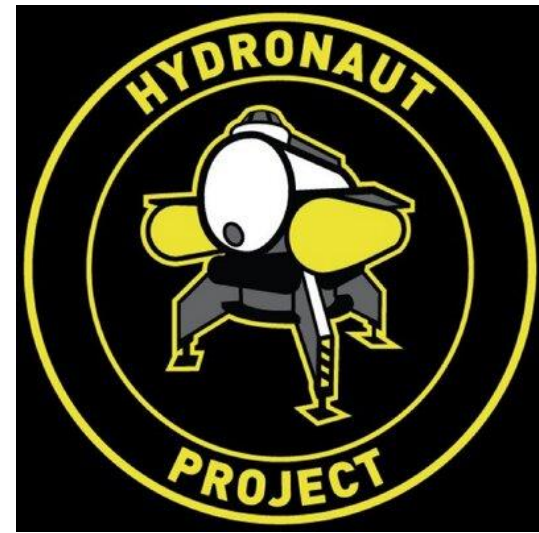




Faculty of Medicine  
and Health Sciences



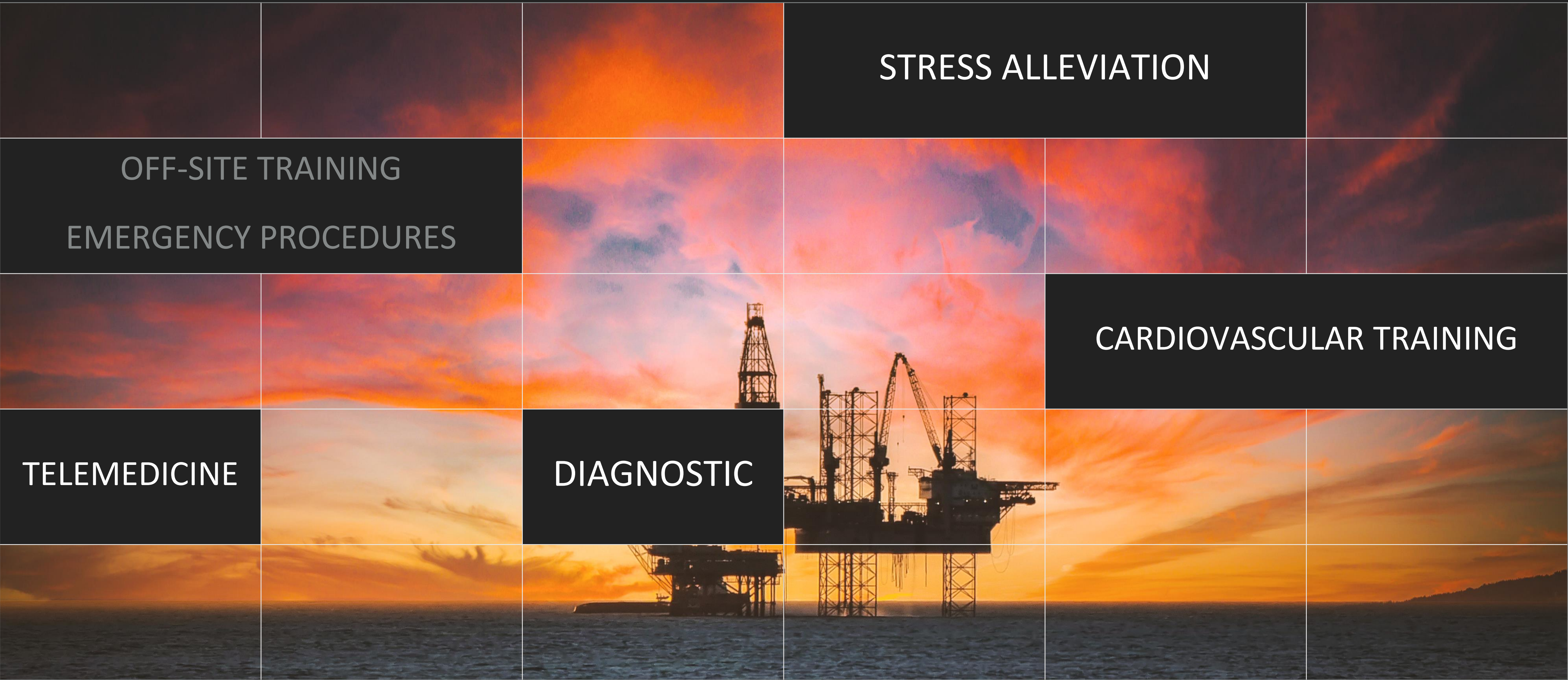
BERGEN INTERNATIONAL DIVING SEMINAR, 2023

# EXPANDING RESEARCH FRONTIERS IN DIVING AND AEROSPACE THROUGH VR





# HOW CAN VR CONTRIBUTE TO BETTER DIVING RESEARCH?



STRESS ALLEVIATION

OFF-SITE TRAINING  
EMERGENCY PROCEDURES

CARDIOVASCULAR TRAINING

TELEMEDICINE

DIAGNOSTIC

# VR AND RESEARCH: STRESS ALLEVIATION

- ▶ Use of multisensory VR immersion in a virtual world for saturation divers
- ▶ Aim: ensure the well being of specialized workers by alleviating physiological and and reducing subjectively reported stress and pain.



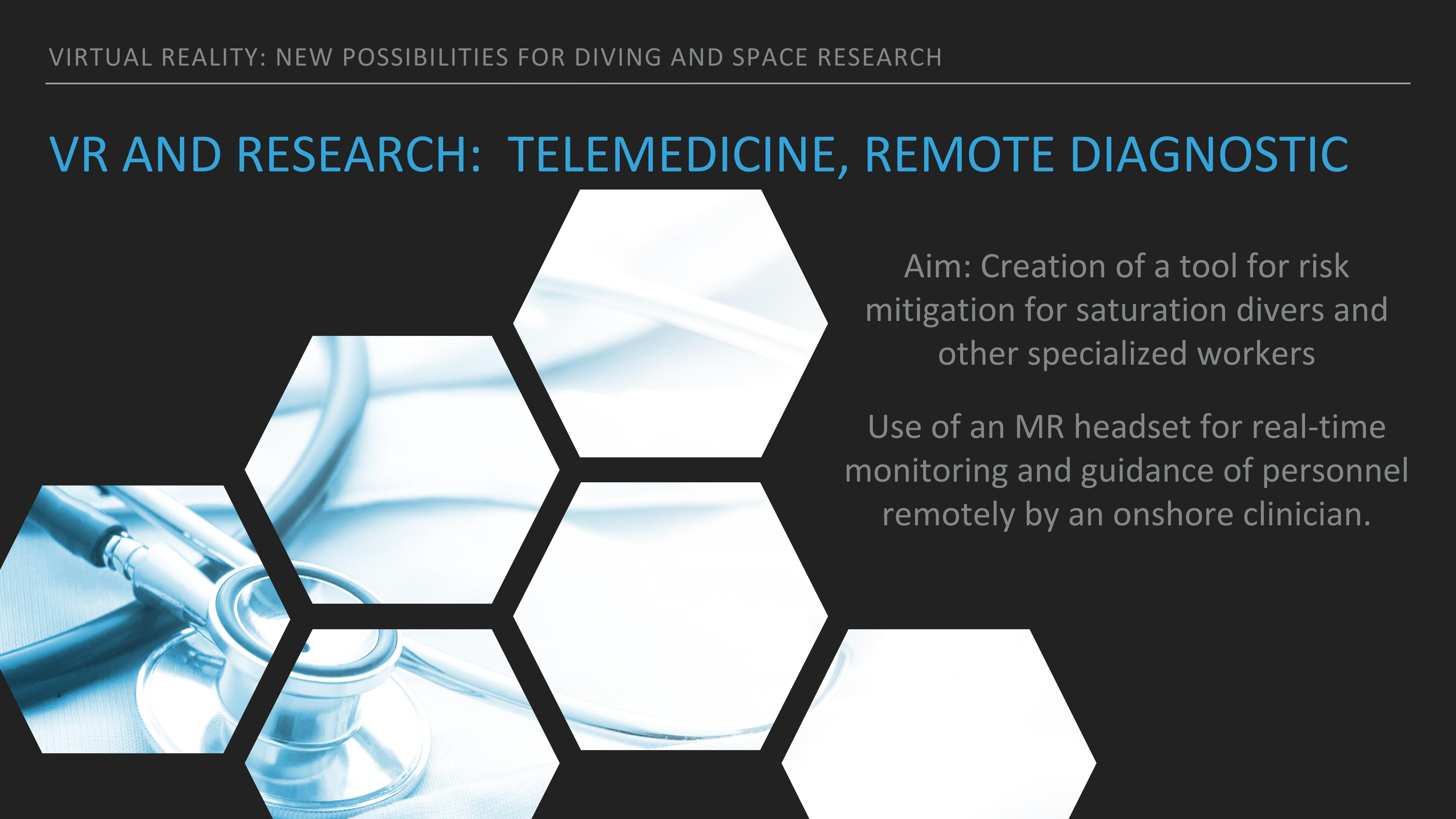


**Aim: quality of life improvements for the users, maintain interest during cardiovascular training, avoid boredom**

**Superimposition of a VR environment during cardiovascular training for astronauts and other personnel**



## VR AND RESEARCH: TELEMEDICINE, REMOTE DIAGNOSTIC

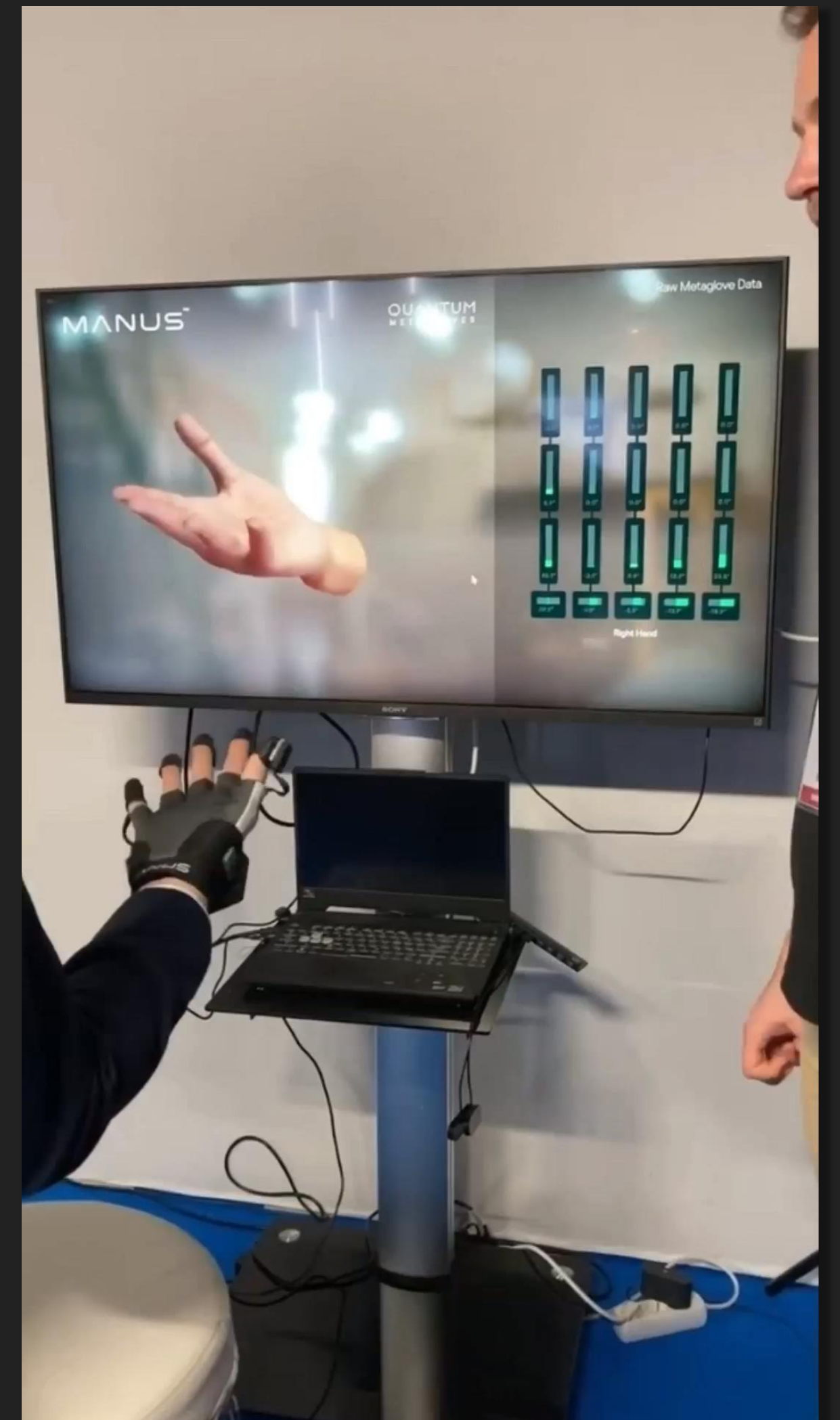


Aim: Creation of a tool for risk mitigation for saturation divers and other specialized workers

Use of an MR headset for real-time monitoring and guidance of personnel remotely by an onshore clinician.

## VR AND RESEARCH: DIAGNOSTIC

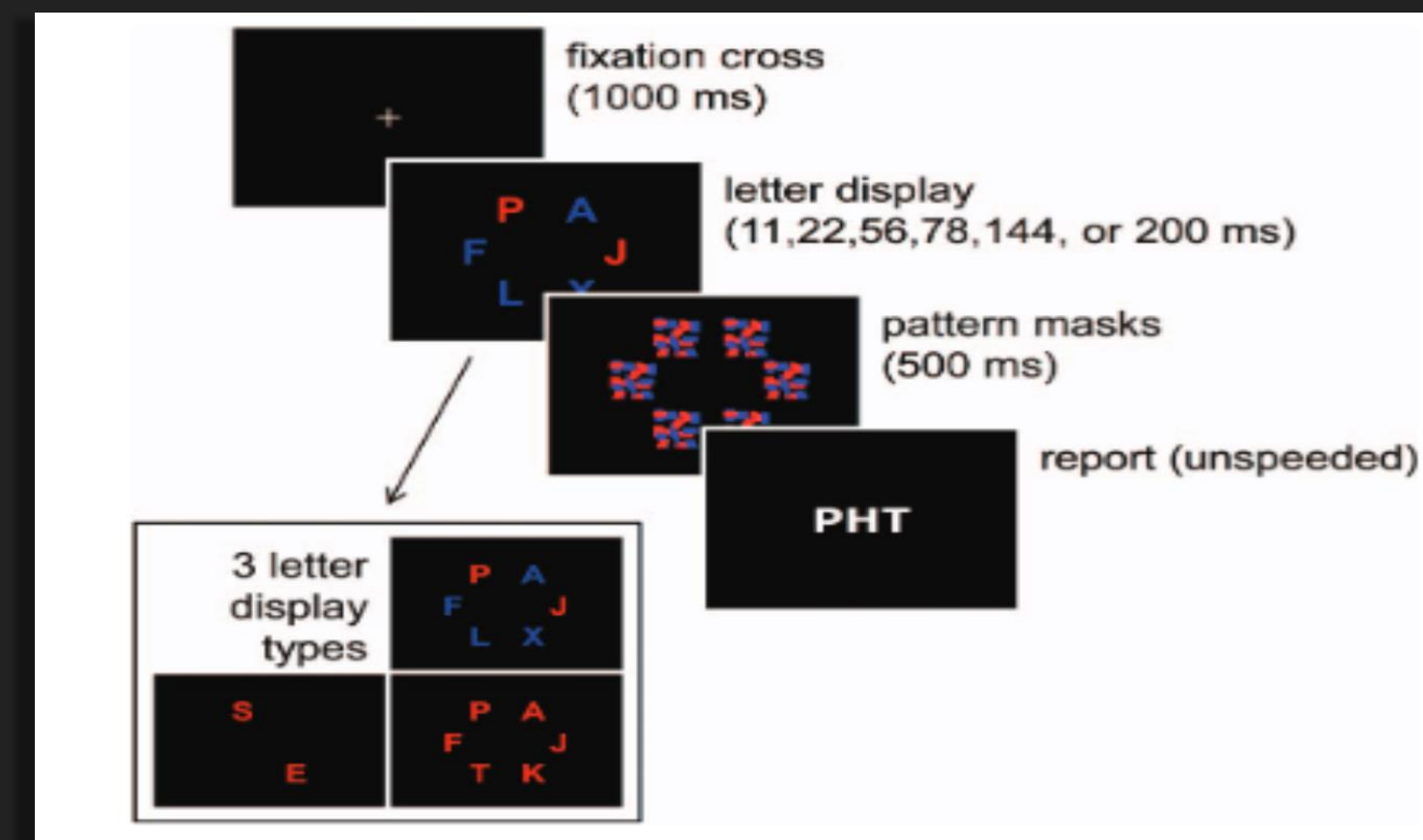
- ▶ Can the application of VR methods improve neurological symptom detection (i.e., HPNS detection)?
- ▶ Aim: to improve the reliability of data for early and precise HPNS detection
- ▶ Methods: Use of a dedicated software to monitor mental performance, tremors, eye movement, and coordination
- ▶ Possible use of motion capture gloves





## VR AND RESEARCH: DIAGNOSTIC

- ▶ Can the application of VR methods improve valid assessment of cognitive functions (i.e., attention, executive functions)?
- ▶ Aim: to improve the ecological validity assessment of cognitive functions of specialized workers.



Neuropsychological Assessment of Visual Selective Attention and Processing Capacity With Head-Mounted Displays (Foerster, et. al., 2019)

## RELEVANCE FOR SPACE TRAVEL

Develop immersive VR software:

Simulate lunar environment

VR immersion during cardiovascular  
training

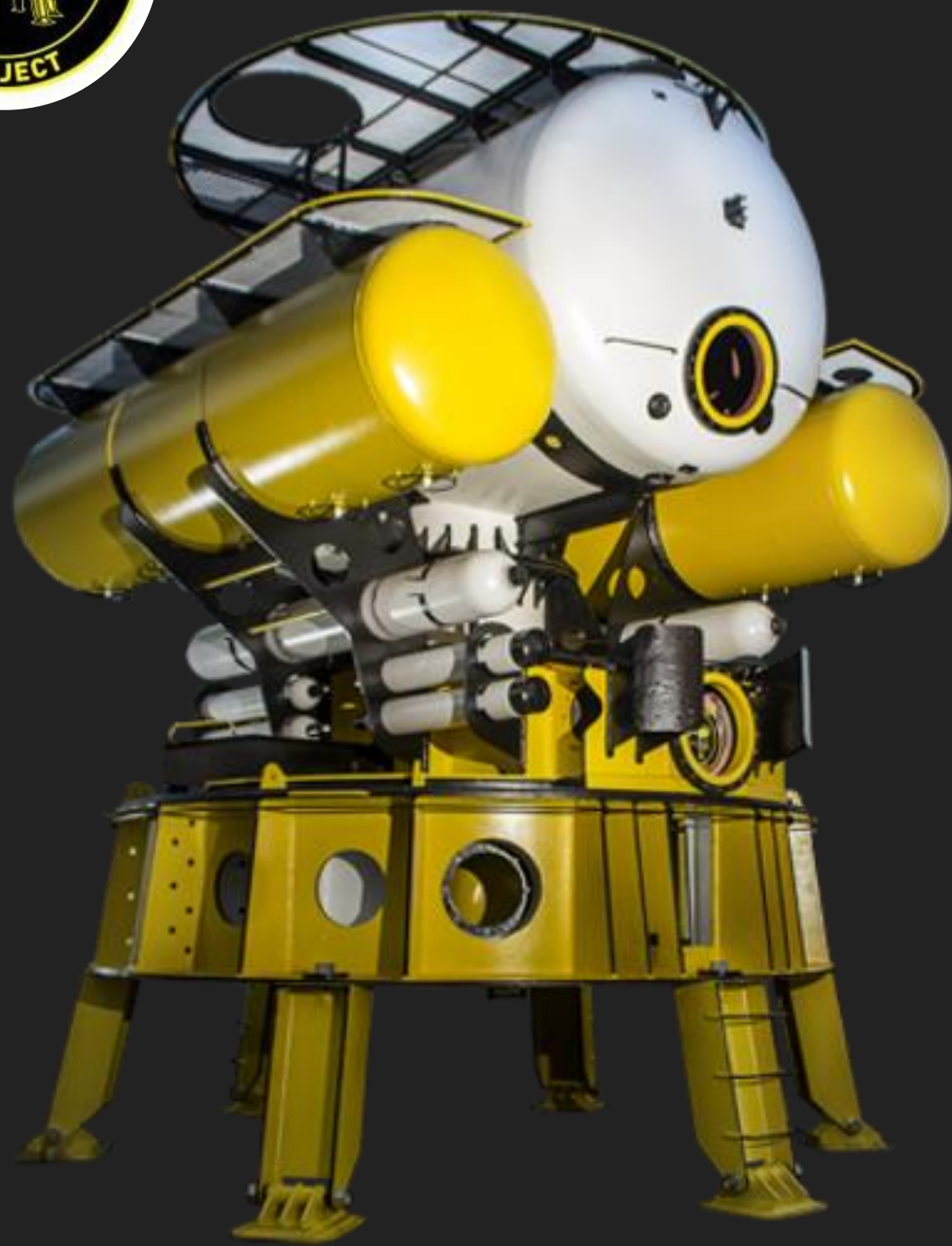
Possible use of VR for stabilometry, hand  
and eye coordination

Motion sickness training



VIRTUAL REALITY: NEW POSSIBILITIES FOR DIVING AND SPACE RESEARCH

# VR IMMERSION DURING CARDIOVASCULAR TRAINING



# EXPANDING RESEARCH FRONTIERS IN DIVING AND AEROSPACE THROUGH VR

Innovation

Collaboration

Health and safety  
improvements

Bridge between  
aerospace and  
diving