# Helmet-Mounted Radiation Attenuation for Astronaut Brains

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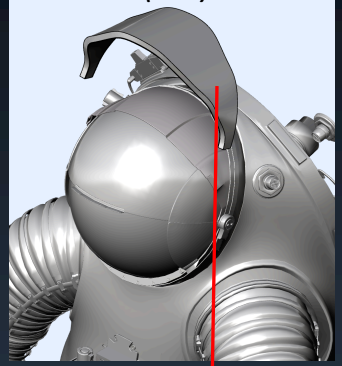
The UC Davis Human/Robotics/Vehicle Integration and Performance (HRVIP) Lab is part of the NASA REVEALS SSERVI. The REVEALS SERVI is designing and testing novel formulations for surface-conductive high-density polyethylene (HDPE) for radiation attenuation

HDPE layers for radiation attenuation may be added:
- Internal to the EMU helmet as a skull-conforming flexible layer, or
- External to the EMU helmet design

Although maximum HDPE is desired for maximum radiation attenuation / scattering, large helmet dimensions become a safety hazard

Anticipated outcomes of the project include: Design, mechanical modeling, radiation analysis, and operational cost/benefit analysis for adding internal and/or external HDPE to the NASA EMU helmet

***xEMU Artemis Helmet (2022)***

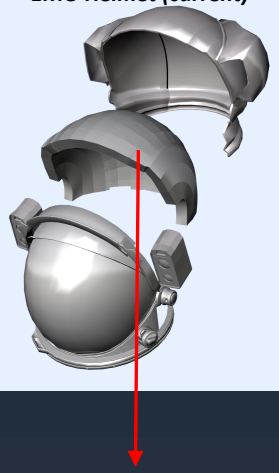


External layer of ~1 cm HDPE applied to NASA xEMU Artemis Helmet

***EMU Helmet (current)***

External layer of ~2 cm HDPE applied to NASA EMU Helmet

***EMU Helmet (current)***



Inner lining of ~1.5 cm HDPE applied to NASA EMU Helmet

The design and dimensions of the EMU helmet affects the net safety status of astronauts in the following ways:
- Ease of head rotation and situational awareness
- Ease of egress/Ingress operations from airlock

A trade study for the addition of HDPE in respect to the potential for maximum radiation attenuation relative to the above considerations much be performed.

***EMU Helmet (current)***

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