



HUMAN HEALTH AND PERFORMANCE

Exploring Space | Enhancing Life

Operational Environment Lighting Analysis

The Operational Environment Lighting Analysis team provides internal and external lighting requirements verification for ISS, ISS commercial cargo and crewed vehicles, and Artemis vehicles. The team also provides lamp and system lighting design, modeling, and test and measurement of lighting and camera systems in their unique lighting lab.

Renowned Skills and Unique Capabilities

Controlled lighting facility with test equipment for measurement of spectral, radiometric, and photometric light properties. Spacious facility with dimensions of 25' W x 300' L x 17' H, including a dedicated dark room for controlled lighting & imaging tests.

Testing & Analysis Services

- Interior / exterior lamp and system lighting design
- Lighting requirements development and verification
- Simulation of orbital and planetary surface lighting environments
- Human anthropometric modeling analysis (volume, reach and clearance)
- Glare and shadow simulation and analysis
- Camera system testing with calibrated lights and solar simulator

Software Modeling Tools

- Radiance: Radiometric and photometric architectural lighting simulation of interior / exterior spacecraft
- Zemax: Spectral optics & lamp development using anthropometric modeling & simulation
- Jack: Anthropometric human modeling and simulation
- Creo Parametric & Rhino: Processing of CAD models & model manipulation
- Dojo: Database of models, materials, and lights; custom utility for setting up lighting simulations

Light Testing Equipment



Spectral Radiance

Spectral Irradiance

Luminance

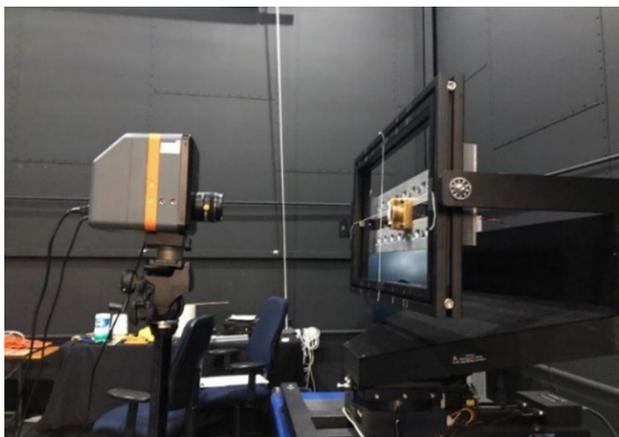
Illuminance

Colorimetry

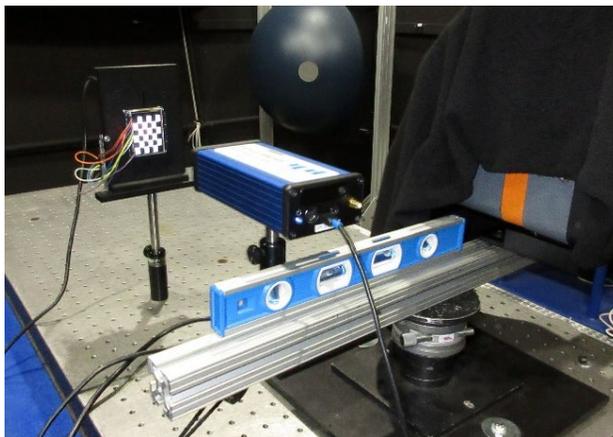
Spectral Reflectance

Multi-angle Reflectance

Johnson Space Center



Beam Pattern Measurement in 180 FOV



Display Illuminance Measurement



Orbital Light Level Simulation



Lighting Environment Test Facility Tunnel



www.nasa.gov

For the benefit of all

For more information:
NASA Human Health and Performance Directorate
www.nasa.gov/hhp/

Points of Contact

Jurine Adolf

jurine.a.adolf@nasa.gov

281.483.2541



William Foley

william.a.foley@nasa.gov

281.792.7512

