



NESC Lunar Lighting Workshop



CONNECTING RIDGE
July 20, 2030

Connecting Ridge

JSC Engineering Lunar Surface Visualization Team Lunar Surface Simulation Presentations

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ELEVATION: 1.496
AZIMUTH: 141.492

Press "t" to toggle fly-cam



Acknowledgments

- NASA collaboration between planetary science and space systems simulation
 - Astromaterials Research and Exploration Sciences (ARES) Team (JSC)
 - NASA Exploration Systems Simulations (NExSyS) Team (JSC)
 - Engineering Simulation and Graphics Lab (ESGL) (JSC)
 - NASA Planetary Geology, Geophysics and Geochemistry Laboratory (GSFC)
 - NASA Dynamics and Real-Time Simulation (DARTS) Lab (JPL)



JSC Engineering (ER7) Visualization Team Members



- Civil Servants

- Eddie Paddock – Engineering VR Technical Discipline Lead
- Lee Bingham – Visualization Lead Engineer

- Contractor Visualization Development Support Team

- CACI

- Brad Bell
- Angelica Garcia
- **Tanner Hunt**
- Anand Patel
- **Billy Young**

- METECS

- Nick Davis
- Cory Foreman
- **Jack Kincaid**
- **Ben Weno**

- CYFOR

- Cheyenne McKeegan
- **Chris Raymond**
- Eric Richeson



Rendering Tools For Simulation Scenario Depictions



- Blender Animation Frame by Frame (Non-real-time) recording – **Chris Raymond**
 1. 1 meter Shape From Shading (SFS) terrain from VIPER site
 2. 1 meter SFS terrain from VIPER site plus enhanced 20 cm data with craters and rocks added
 - F-stop of 11 for aperture settings of view
 - xINFO suit lights (on at approaching boulder)
 - Global or reflective illumination
- Unity desktop real-time recording (comparable to VR real-time view) – **Bill Young & Tanner Hunt**
 - 1 meter SFS terrain from VIPER site plus enhanced 20 cm data with craters (no rocks)
 - F-stop of 11 for aperture settings of view
 - xINFO suit lights (on at approaching boulder)
 - No refraction
- Unreal5 desktop real-time recording (Not all features not available in VR) – **Jack Kincaid & Ben Weno**
 - 1 meter SFS terrain from VIPER site plus enhanced 20 cm data with craters and rocks added
 - F-stop of 5.6 for aperture settings of view
 - xINFO suit lights (on at approaching boulder)
 - Global or reflective illumination
 - Ray casting for sharper shadows
 - Virtual Shadow mapping with ray tracing for “soft shadows”
 - Double Precision capable for planetary data

Sun: ON, Blackbody 5900, Strength: 587.810 W/m², ounces 1024; Earthshine: OFF; xINFO Lights: OFF

f/1



f/2



Blender 1m SFS terrain
Global Illuminations/Reflections
Default aperture is F11

f/5.6



f/11



Sun: ON, Blackbody 5900, Strength: 587.810 W/m², ounces 1024; Earthshine: OFF; xINFO Lights: OFF

f/1



f/2



Blender 1m SFS terrain plus added craters & rocks (20
Global Illuminations/Reflections
Default aperture is F11

f/5.6



f/11



f/1

Unity 1m SFS terrain plus added craters (20 cm)
No Reflections
Default aperture is F11



Unreal5 1m SFS terrain plus added craters & rocks (20 cm)
Global Illuminations/Reflections
Default aperture is F5.6





Questions?