

# PRoViDE Envisaged Viewer

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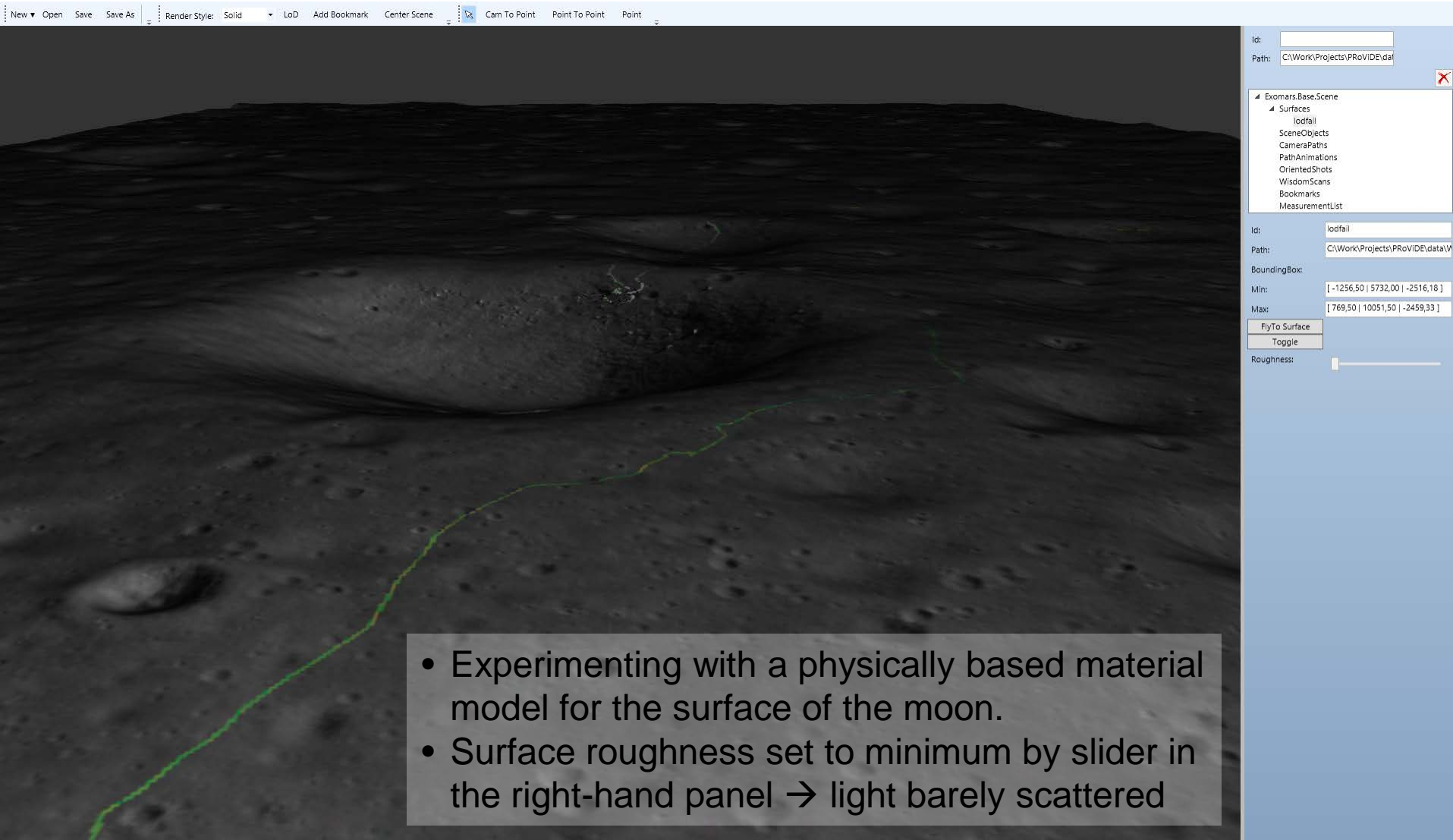


# Envisaged Viewer

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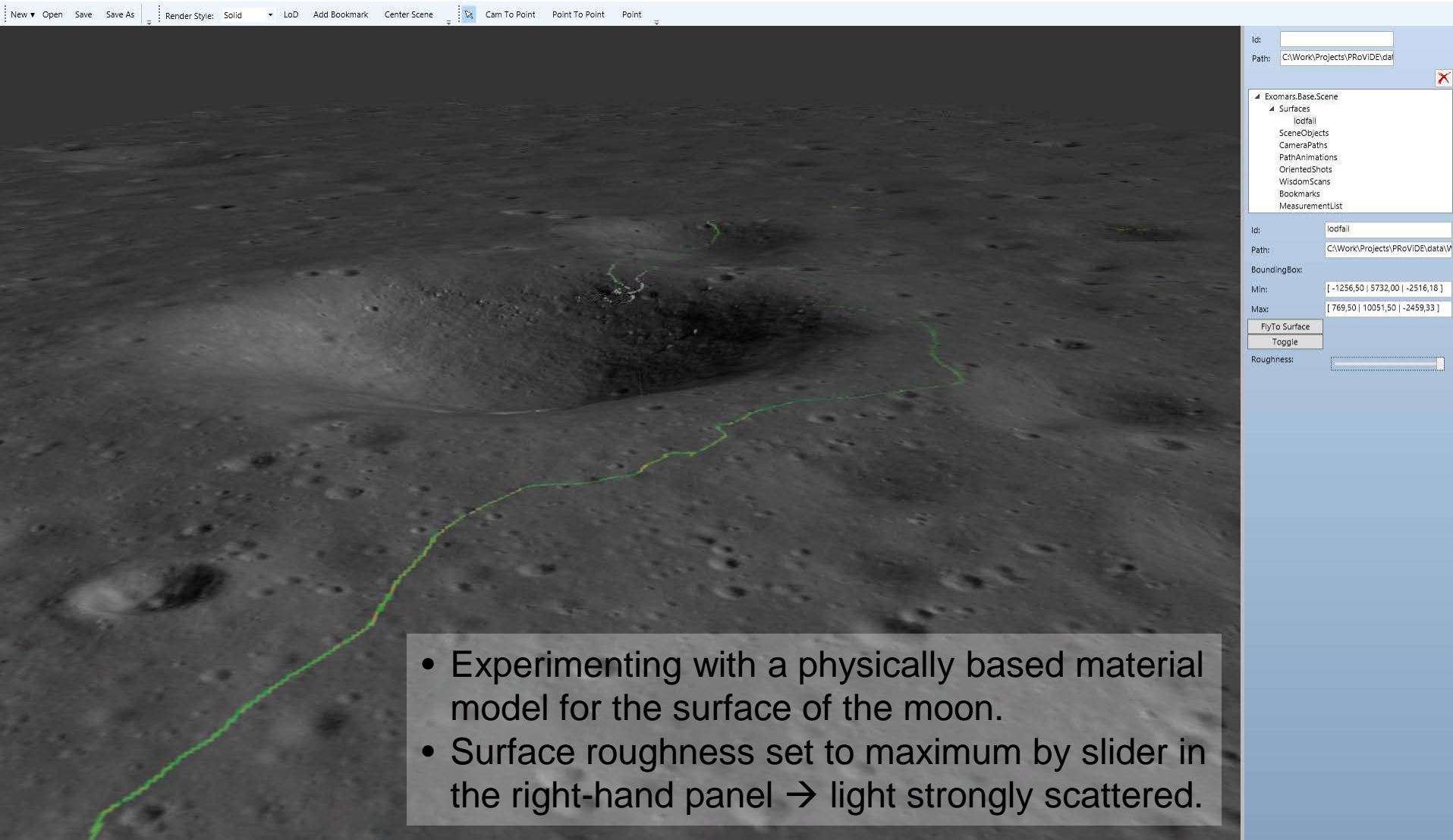
- **Real-time rendering solution for scientific exploration and planning**
- **Visual quality sufficient for geological assessment**
- **Measurement and simulation of physical material properties of rock surfaces**
- **Implemented as “shaders” that run directly on the Graphics Processing Unit (GPU) and hence in real-time**

# Envisaged Viewer



- Experimenting with a physically based material model for the surface of the moon.
- Surface roughness set to minimum by slider in the right-hand panel → light barely scattered

# Envisaged Viewer



- Experimenting with a physically based material model for the surface of the moon.
- Surface roughness set to maximum by slider in the right-hand panel → light strongly scattered.

# Envisaged Viewer

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- **Illumination:**
  - **Switch between skylight models of Earth and Mars**
    - See rocks as they would appear on Earth to support geological assessment
  - **Set date and time to define position of the sun (primary light source)**
  - **Consider Aerosol Optical Depth (AOD) for Mars skylight model**
    - Scattering of sun light as secondary light source

# Envisaged Viewer

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- **Navigation:**
  - **Seamless zoom in a broad range of scales**
    - **Orbital to close-up of terrain features (rock outcrops)**
  - **Provide standard modes like in games**
    - **Make them more useable for different scales by automatically adjust sensitivity**
  - **Switch between walk and fly mode**
    - **First one is constraint by terrain**

# Envisaged Viewer

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- **Geo-referenced images:**
  - Embedded in 3D scene as image plane
  - Choose among a list of source images
  - Compare images with 3D reconstruction to study spatial context
    - Can be switched on or off
    - Adjust transparency
  - Examine image details in 2D image viewer
  - Ortho-image provided in separate panel as navigation aid (like a map)



# Envisaged Viewer

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- **Annotations:**
  - Add annotations at arbitrary positions in 3D scene or 2D images
  - They are shown as coloured labels containing text and links
  - Can be switched on and off
  - Listed in a GUI panel
  - Can be used as landmarks to jump to the corresponding location
  - Exchange annotations with ProGIS



# Envisaged Viewer

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- **Measurements:**
  - Provide tools for direct measurements in 3D scene and in source images
  - Get geo-location of selected terrain point or image pixel
  - Measure distance between two terrain points or image pixels
  - Measure distance from viewpoint to terrain point

# Envisaged Viewer

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- **Measurements:**
  - Listed in a GUI panel
  - Jump to location of selected measurements
  - Visualize measurements in 3D and 2D viewer
    - Lines, points, labels
  - Export measurements as text or CSV

# Envisaged Viewer

- **3D models and animations:**
  - Import auxiliary 3D models and position them in 3D scene
    - Rover model, yardsticks, ...
  - Import animation curves for rovers
    - From simulator or animation tools
    - Control playback by GUI

