This paper describes objective technical results and analysis. Any subjective views or opinions that might be expressed in the paper do not necessarily represent the views of the U.S. Department of Energy or the United States Government.

SAND2022-9136C

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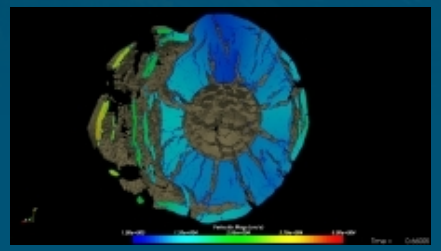
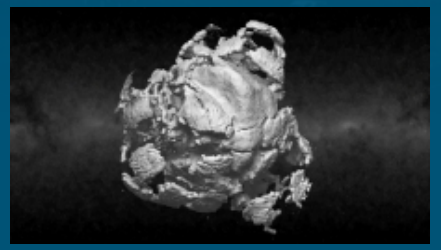
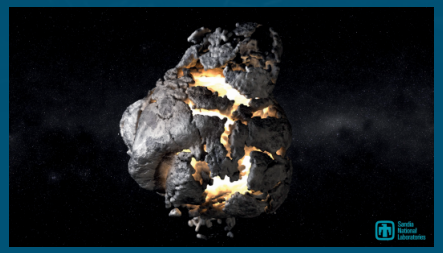
Paraview & Omniverse XR







PRESENTED BY

Brad Carvey

Approved for Unlimited Release:

July 2022

BRAD CARVEY

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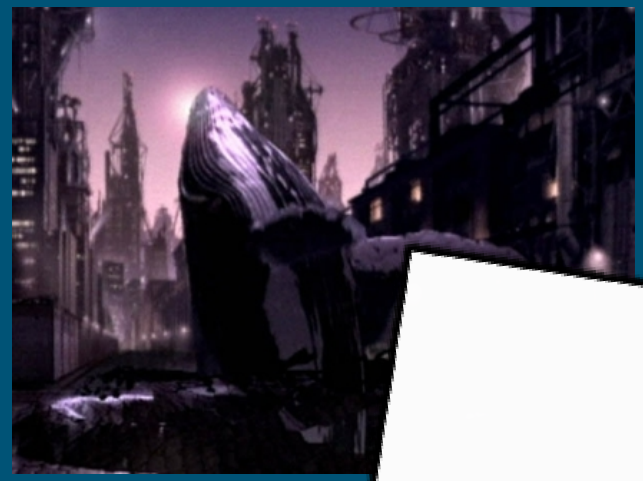
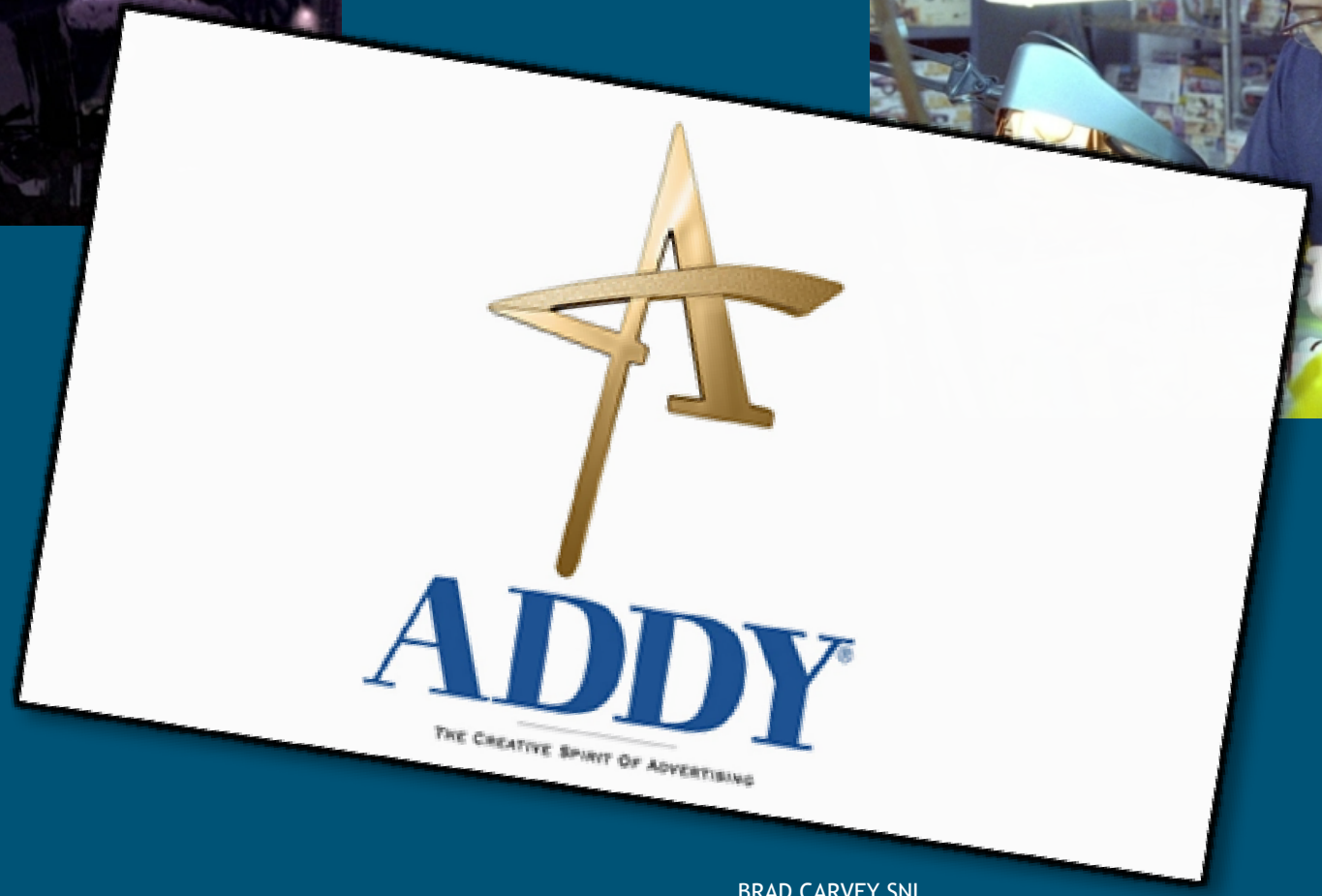
Outstanding Achievement in Engineering

BRAD CARVEY SNL

Addy Award





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Nature Magazine

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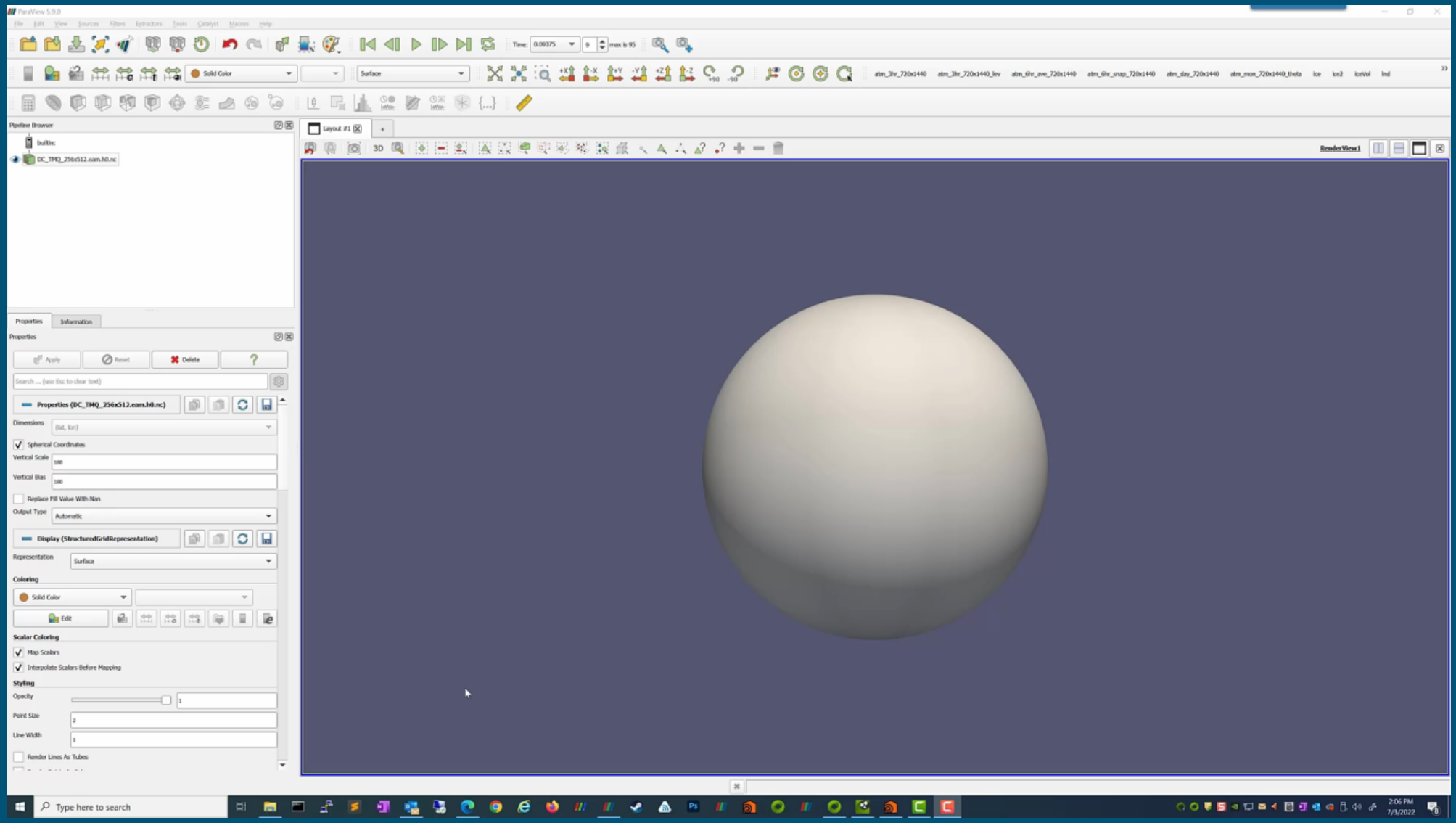
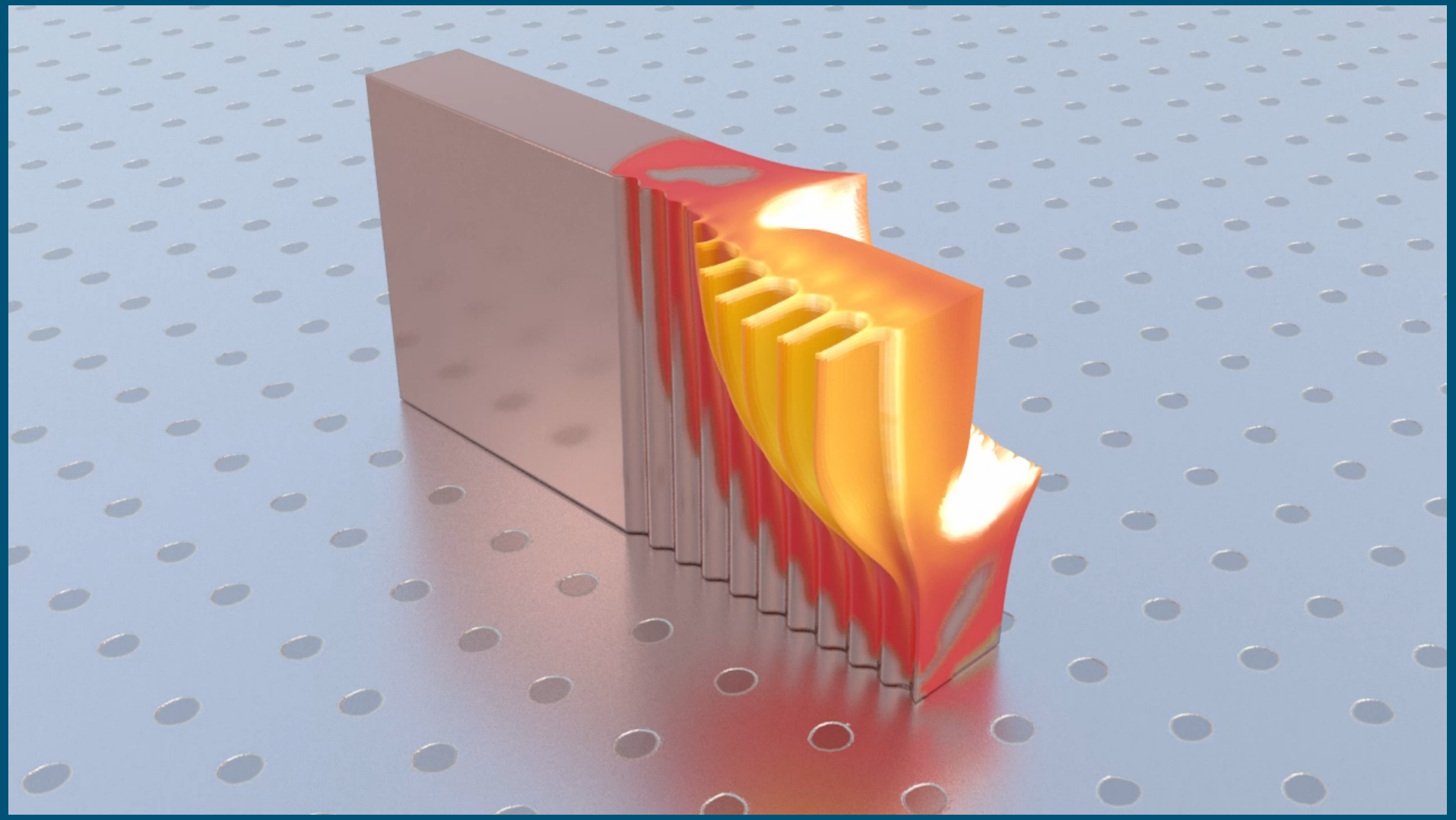
Quick Paraview to Omniverse VR demo



Creating a more Impactful Visualization



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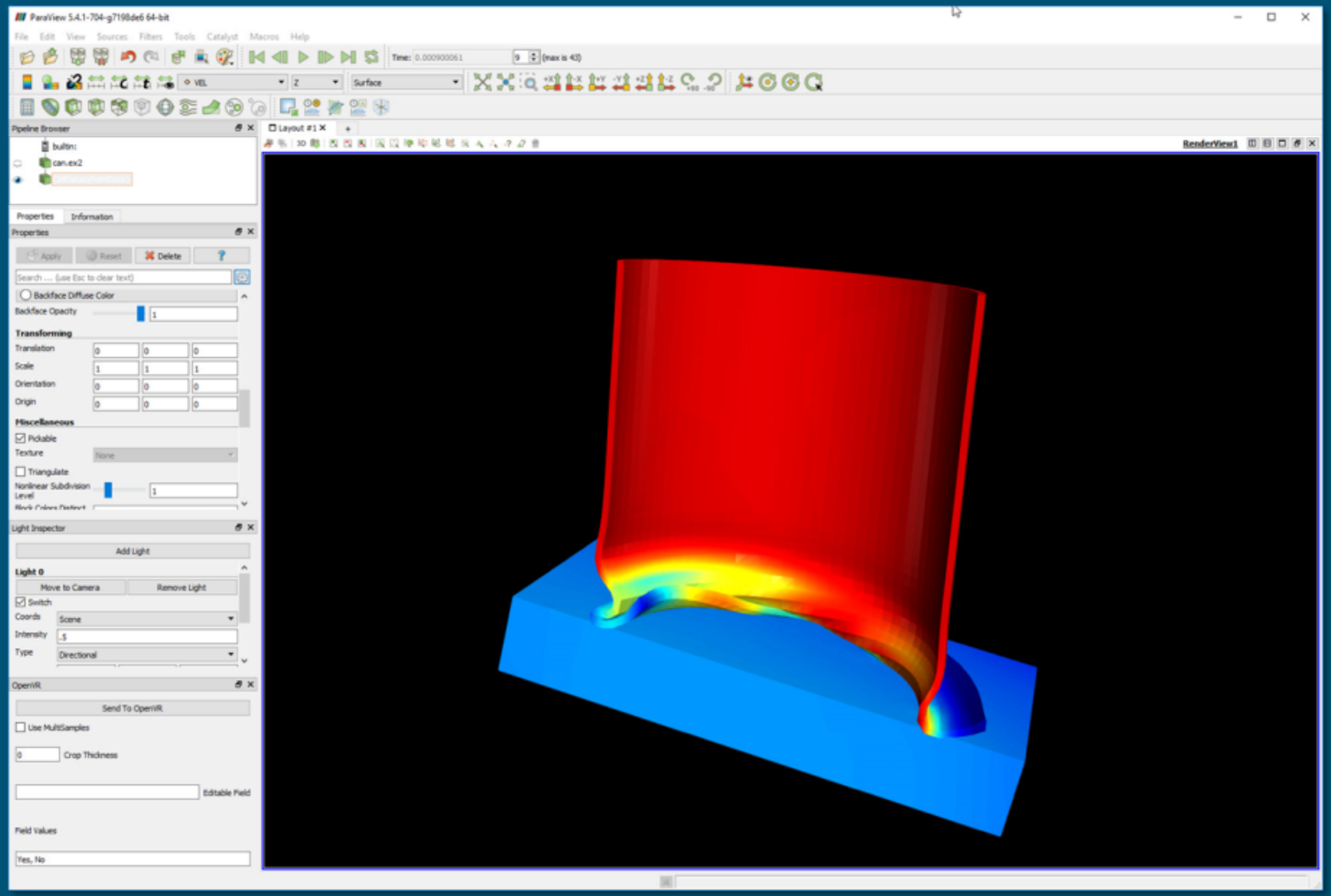
Paraview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File Edit View Sources Filters Tools Catalyst Macros Help
Pipeline Browser
builtin:
can.ex2
Properties Information
Properties
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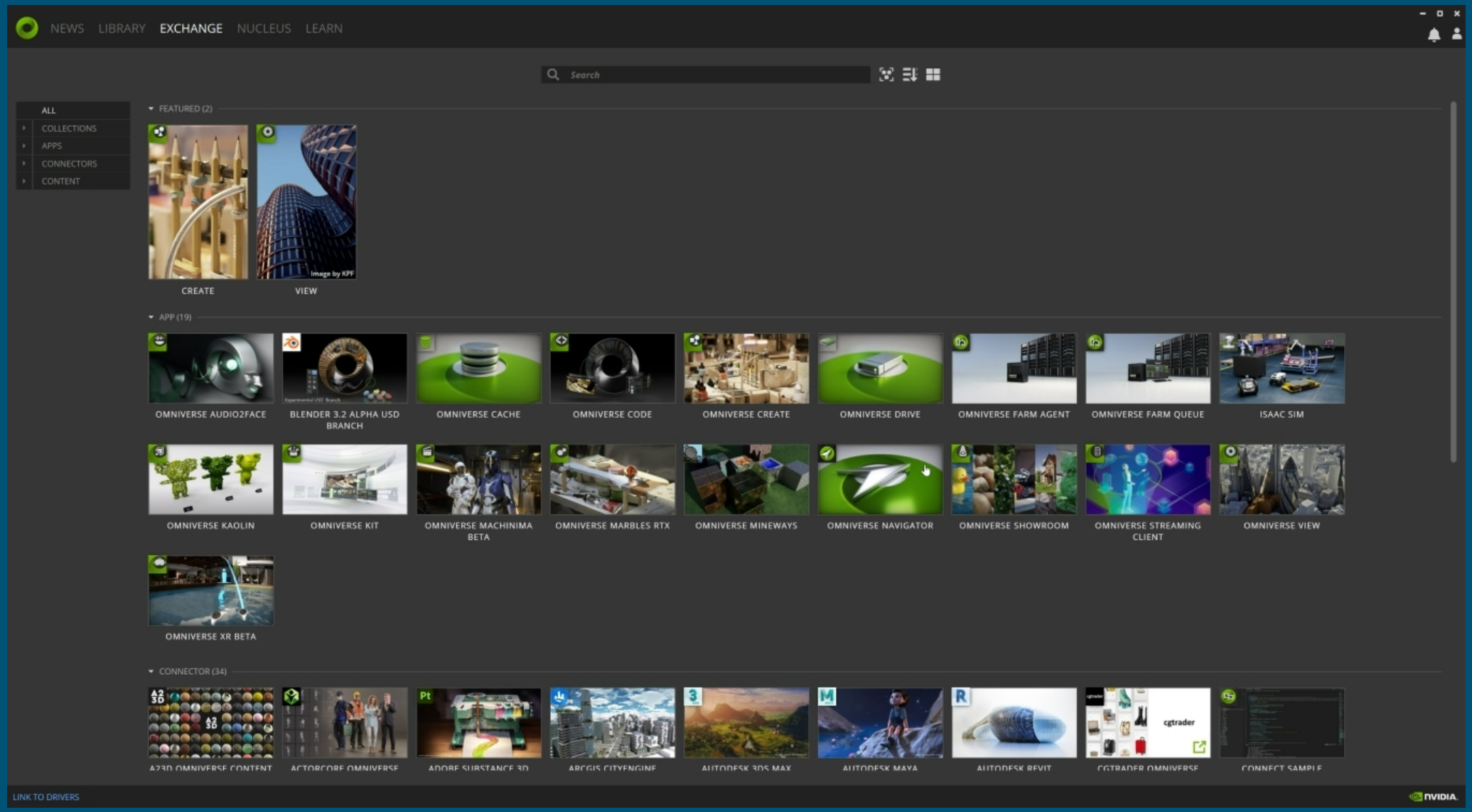
Backface Diffuse Color
Backface Opacity
Transforming
Translation
Scale
Orientation
Origin
Miscellaneous
Pickable
Texture
Triangulate
Nonlinear Subdivision Level
Light Inspector
Add Light
Light 0
Move to Camera
Remove Light
Switch
Coords
Intensity
Type
Directional
OpenVR
Send To OpenVR
Use MultiSamples
Crop Thickness
Editable Field
Field Values
Yes, No
Layout #1
RenderView1

Omniverse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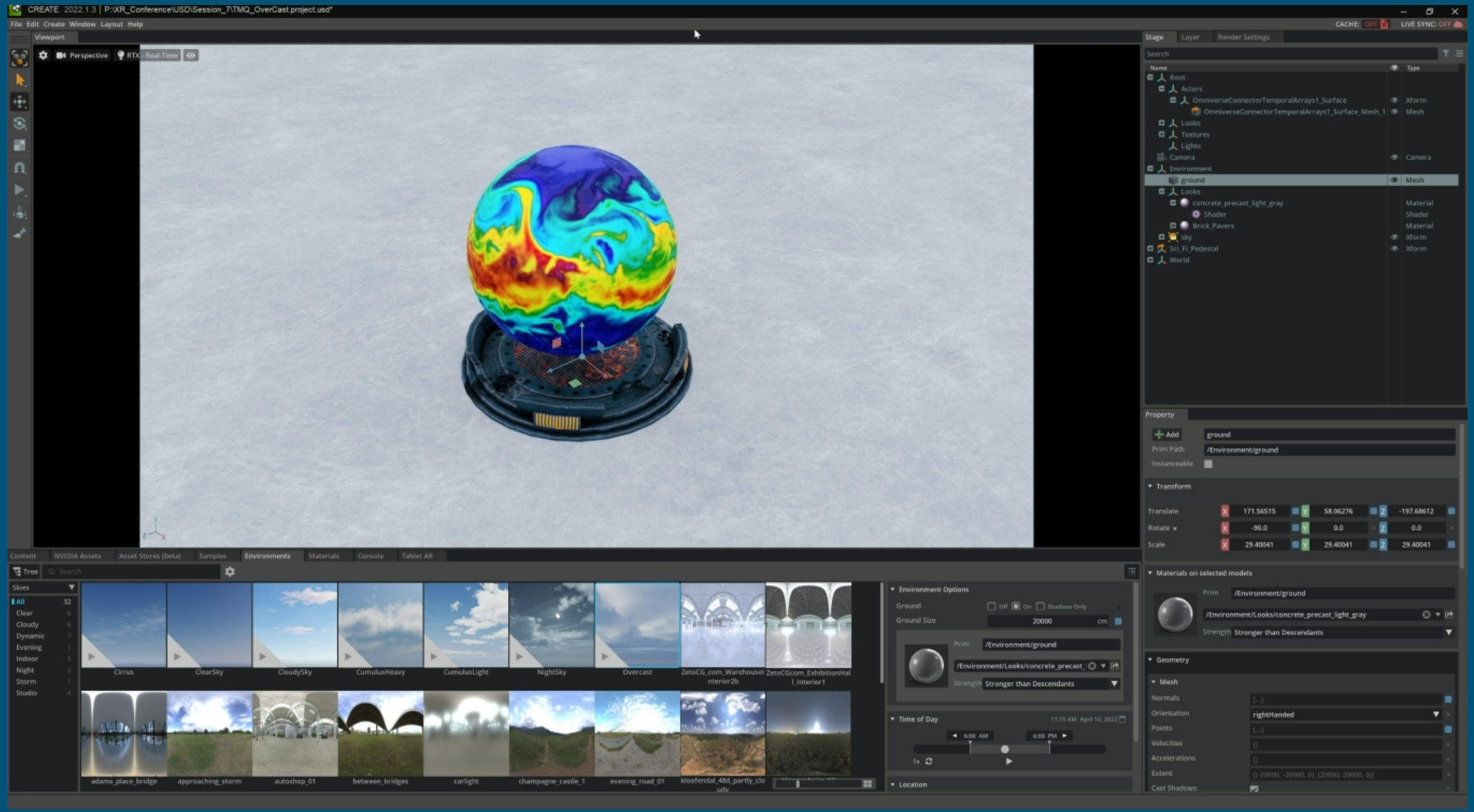
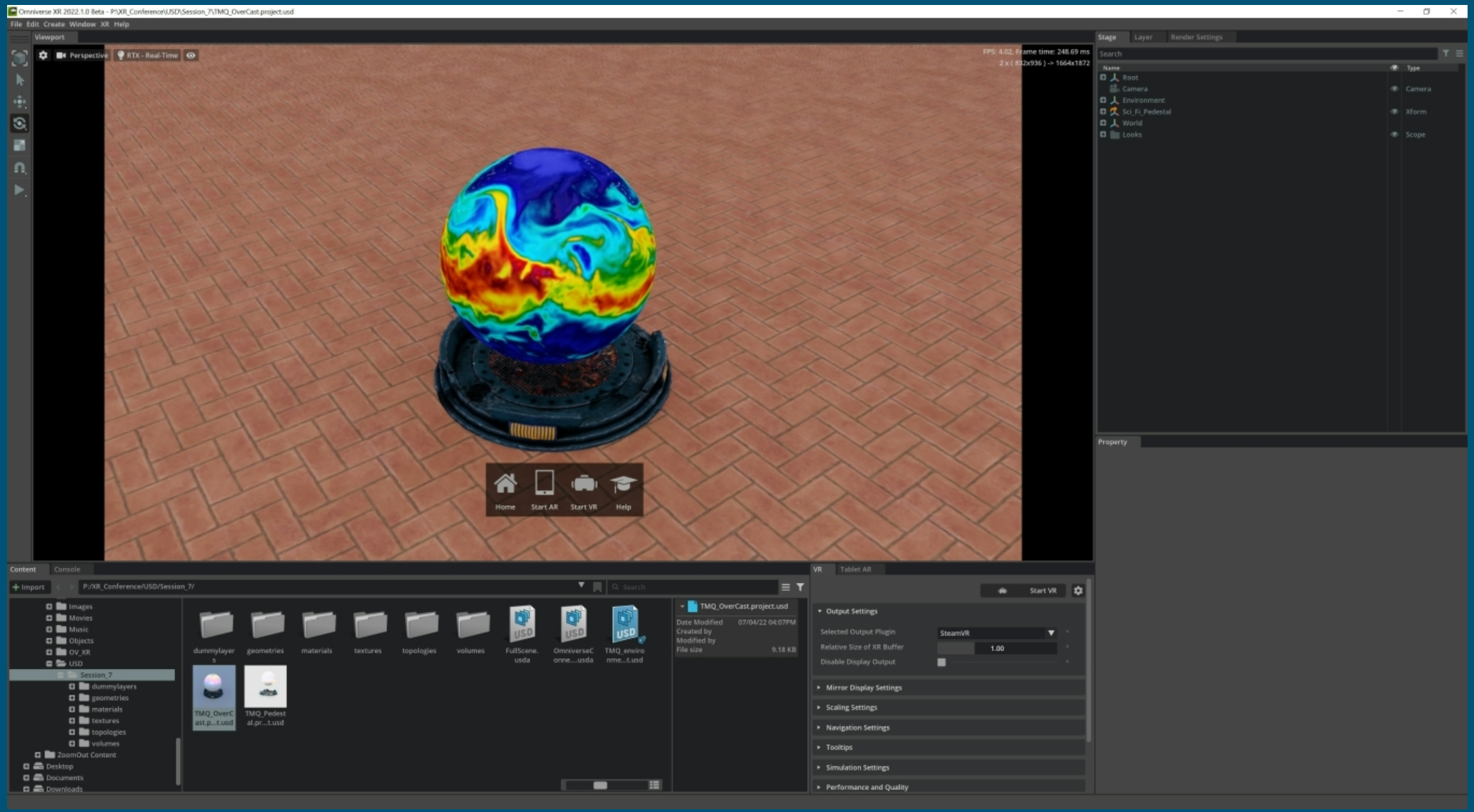
NUCLEUS
LEARN
Search
ALL
COLLECTIONS
APPS
CONNECTORS
CONTENT
FEATURED (2)
CREATE
VIEW
APP (19)
OMNIVERSE AUDIO2FACE
BLENDER 3.2 ALPHA USD BRANCH
OMNIVERSE CACHE
OMNIVERSE CODE
OMNIVERSE CREATE
OMNIVERSE DRIVE
OMNIVERSE FARM AGENT
OMNIVERSE FARM QUEUE
ISAAC SIM
OMNIVERSE KAOLIN
OMNIVERSE KIT
OMNIVERSE MACHINIMA BETA
OMNIVERSE MARBLES RTX
OMNIVERSE MINEWAYS
OMNIVERSE NAVIGATOR
OMNIVERSE SHOWROOM
OMNIVERSE STREAMING CLIENT
OMNIVERSE VIEW
OMNIVERSE XR BETA
CONNECTOR (34)
LINK TO DRIVERS
NVIDIA

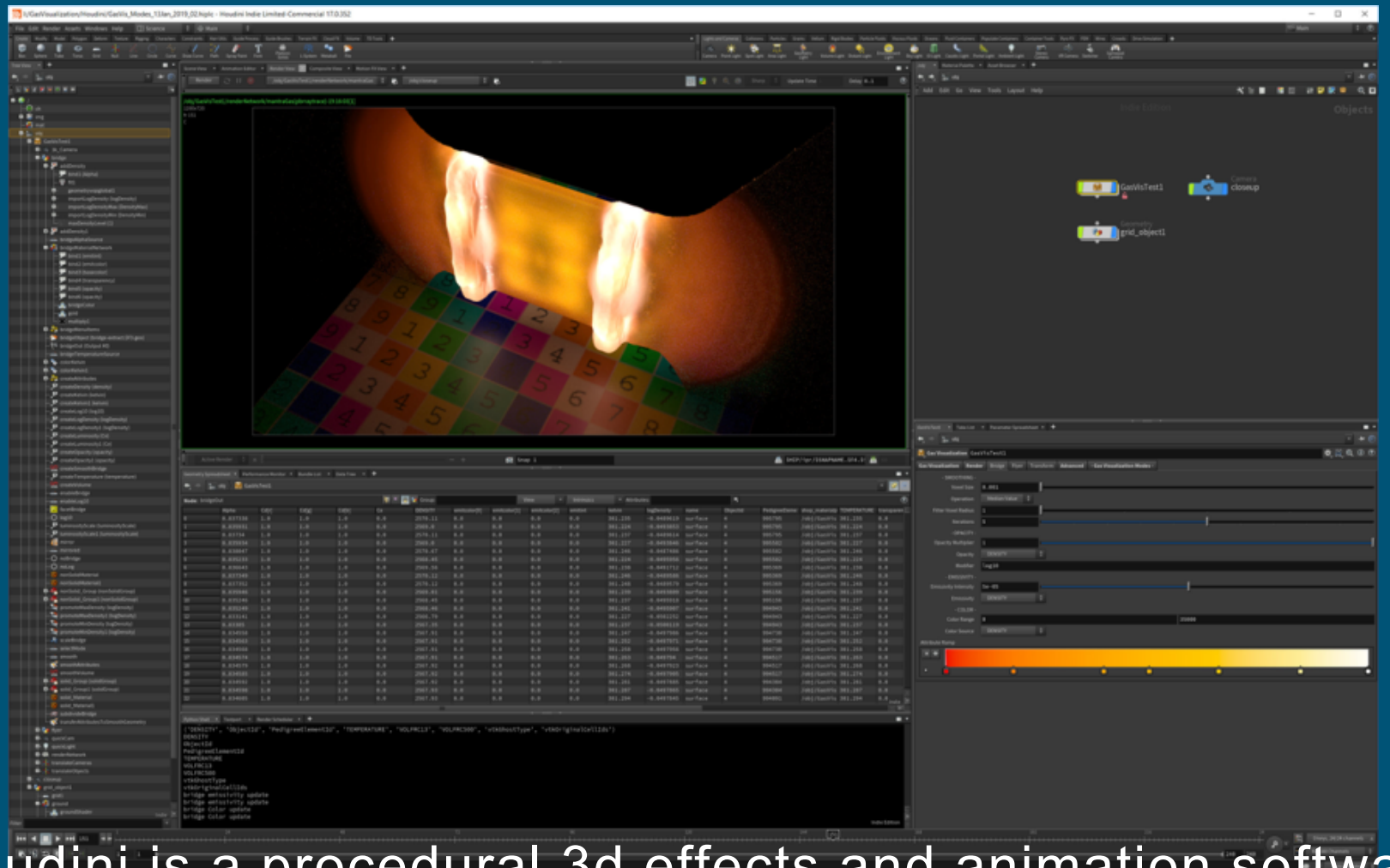
Omniverse Create



Omniverse XR



Houdini



Houdini is a procedural 3d effects and animation software application, used by major VFX studio for the creation of Feature Films and Games.

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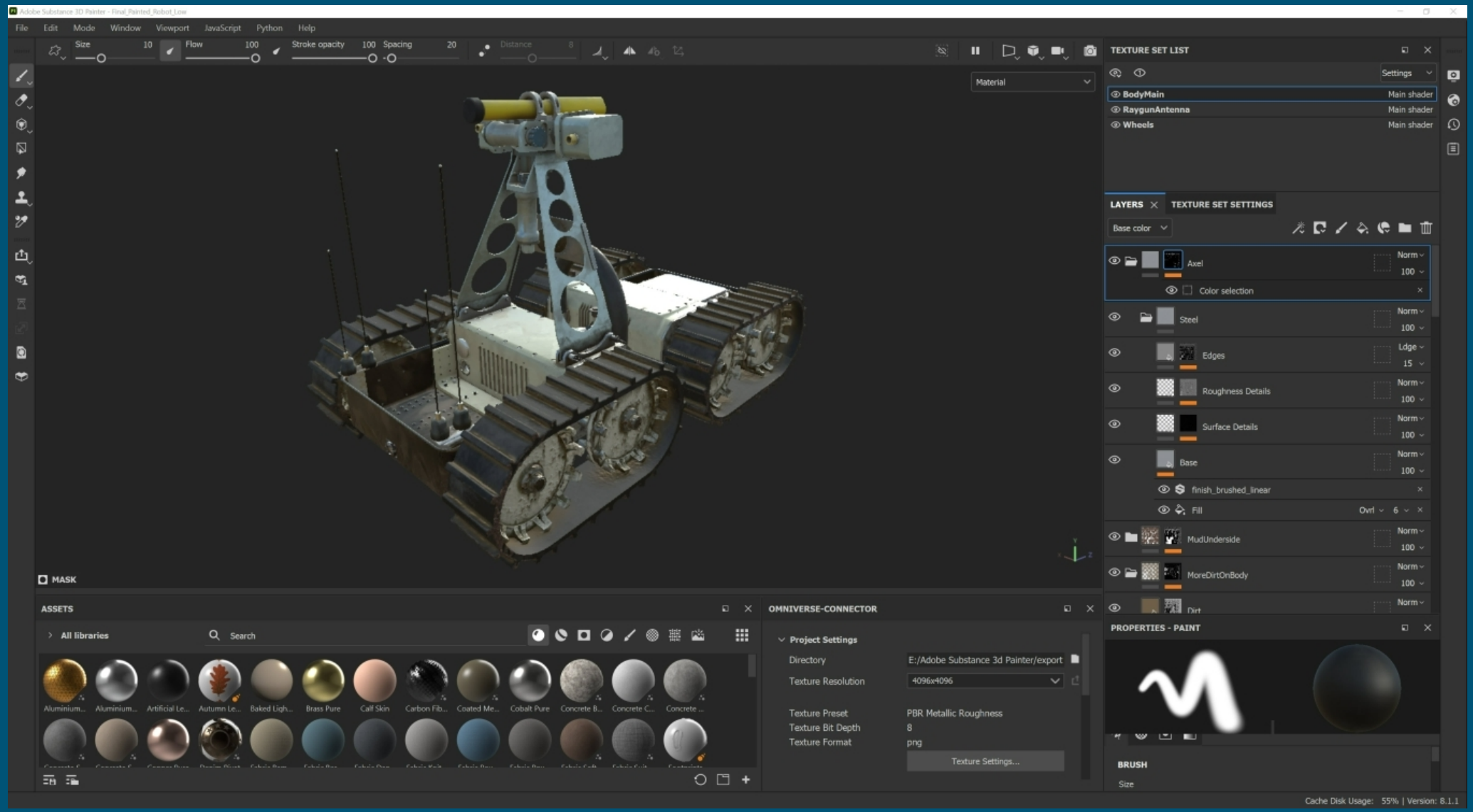
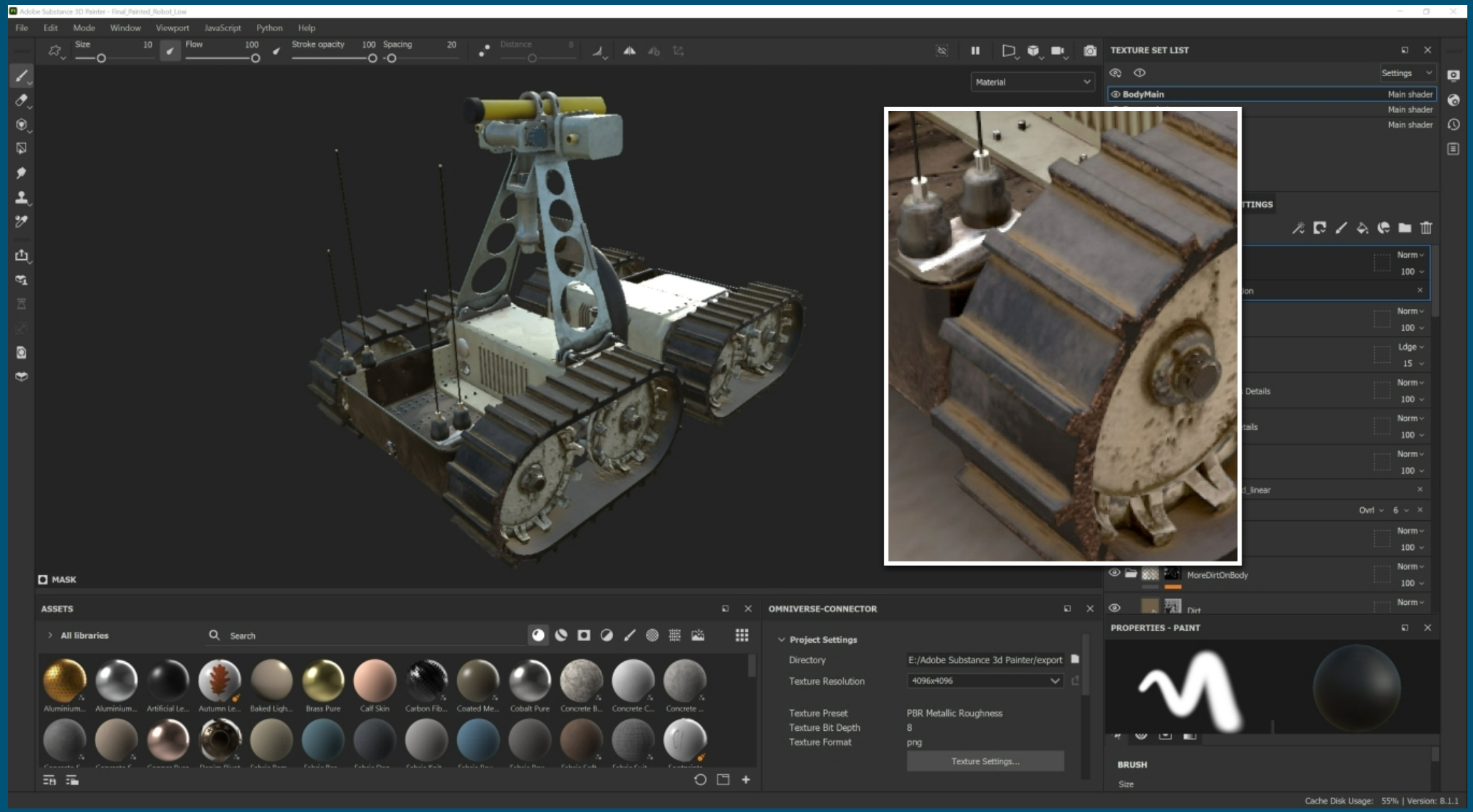
Substance Painter



Substance Painter



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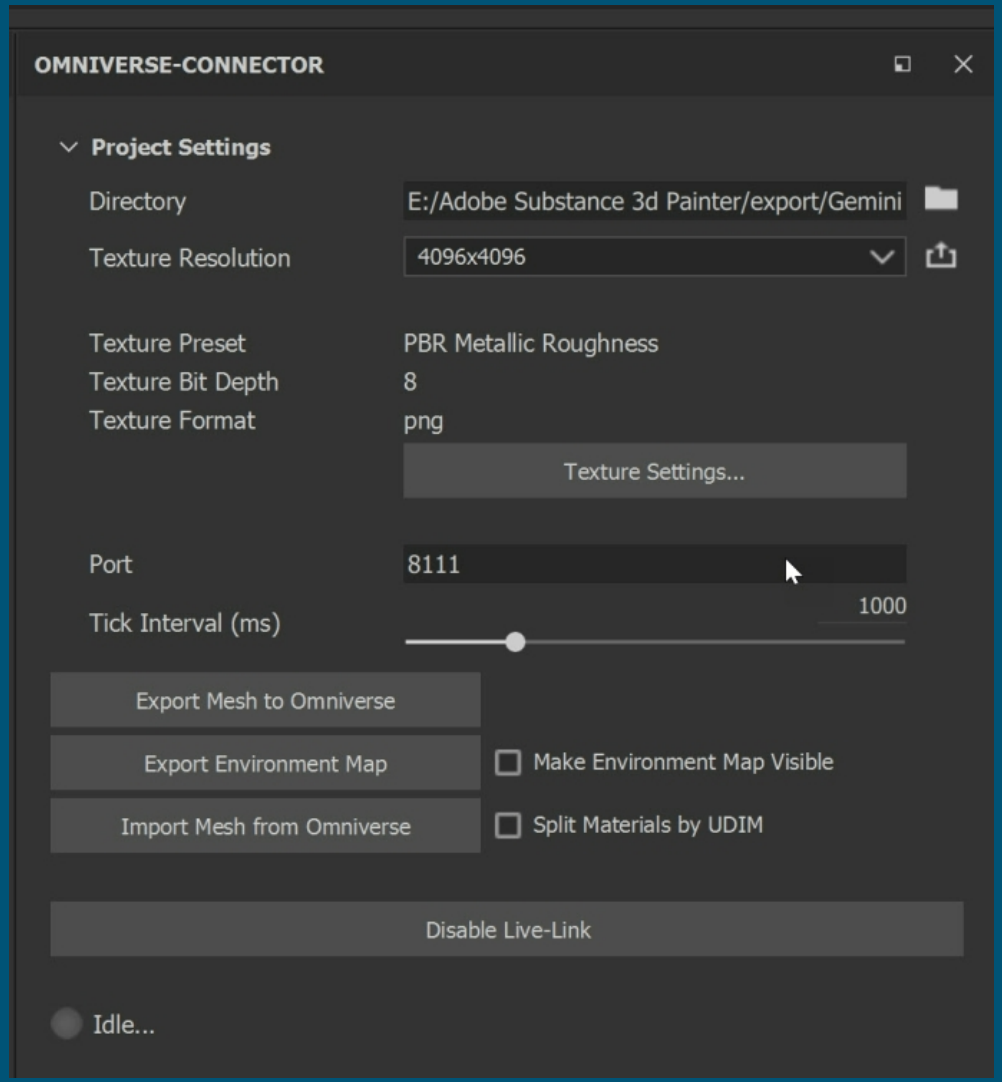
Substance Painter Connector



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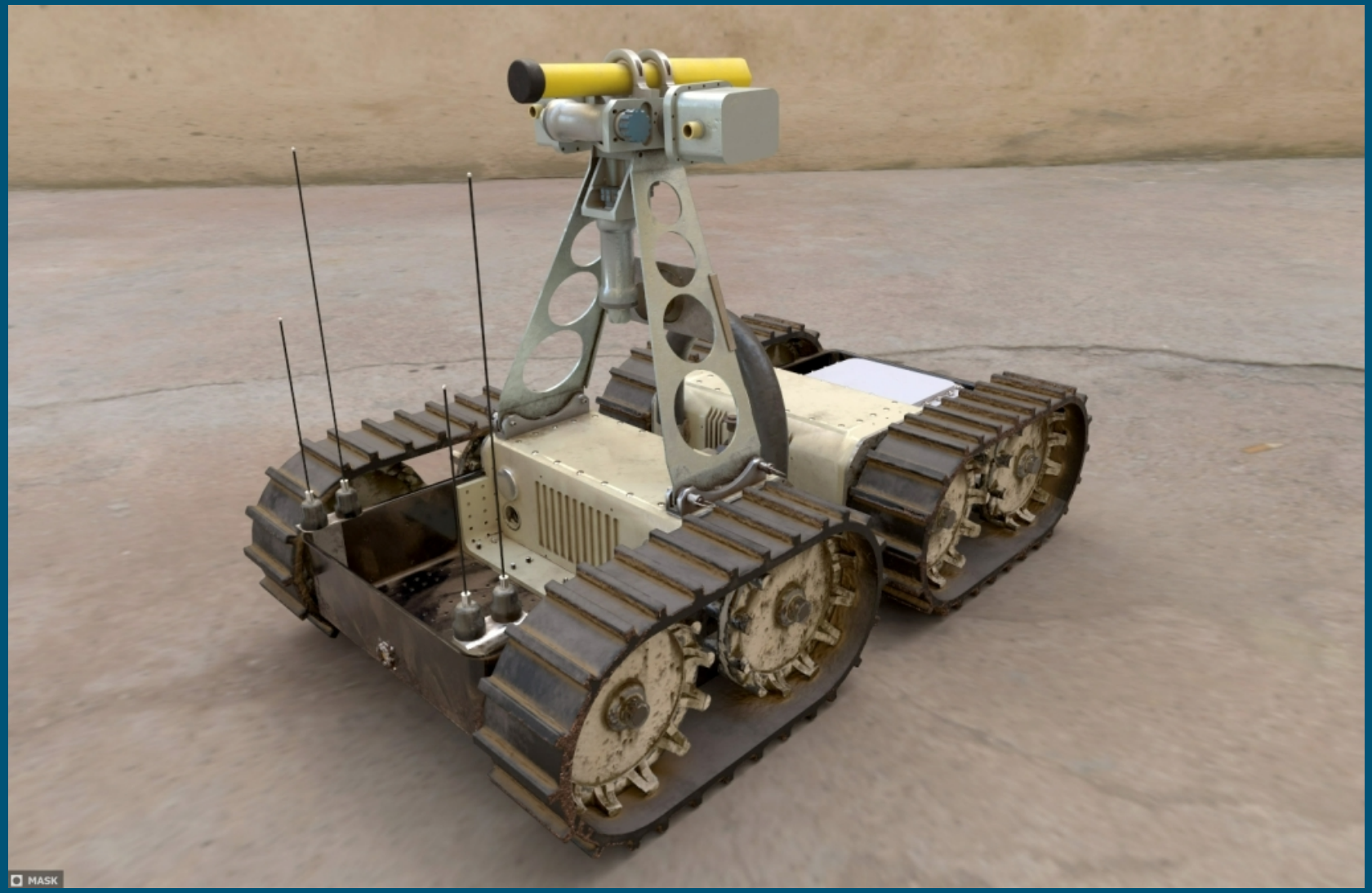
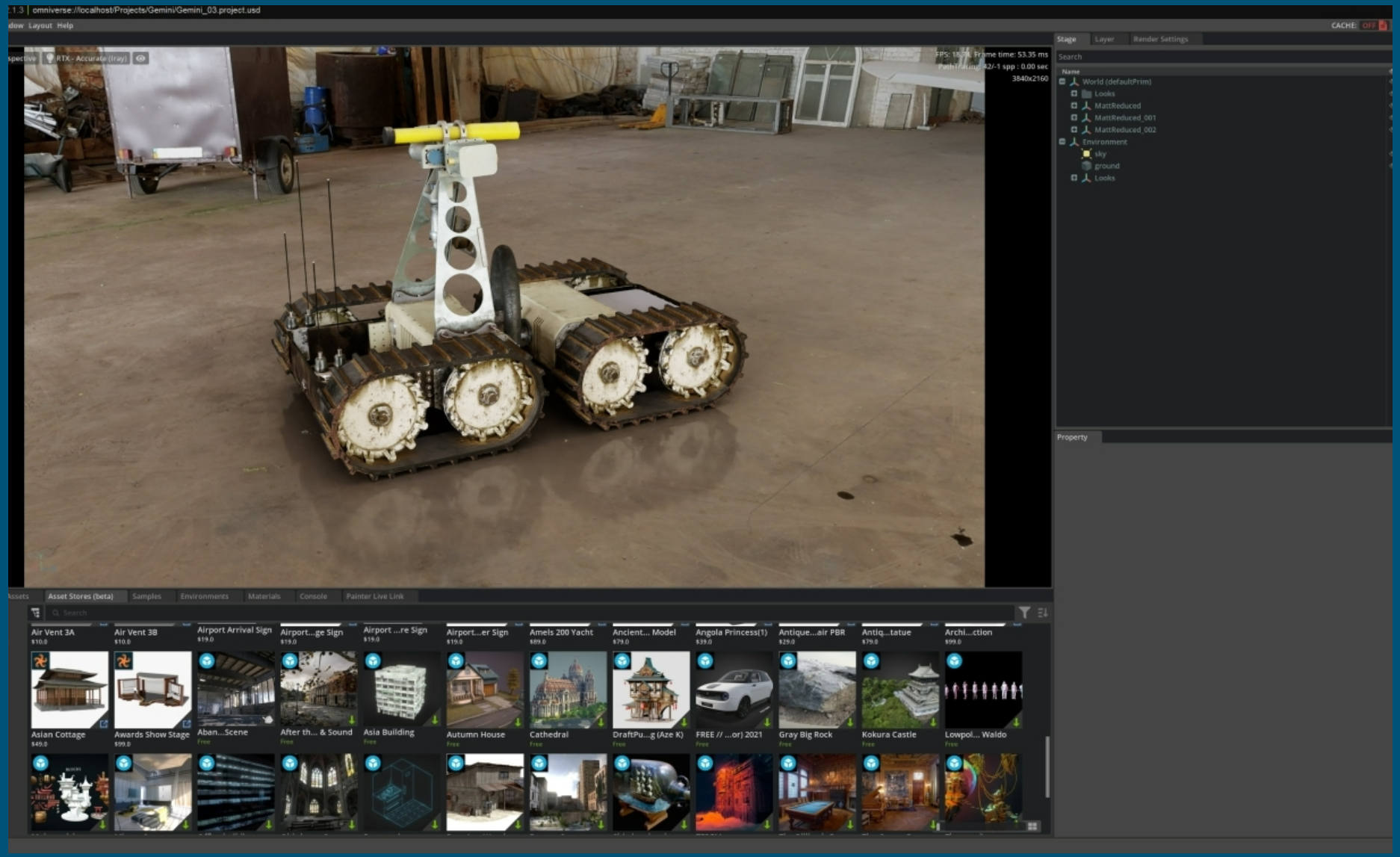


Omniverse Create



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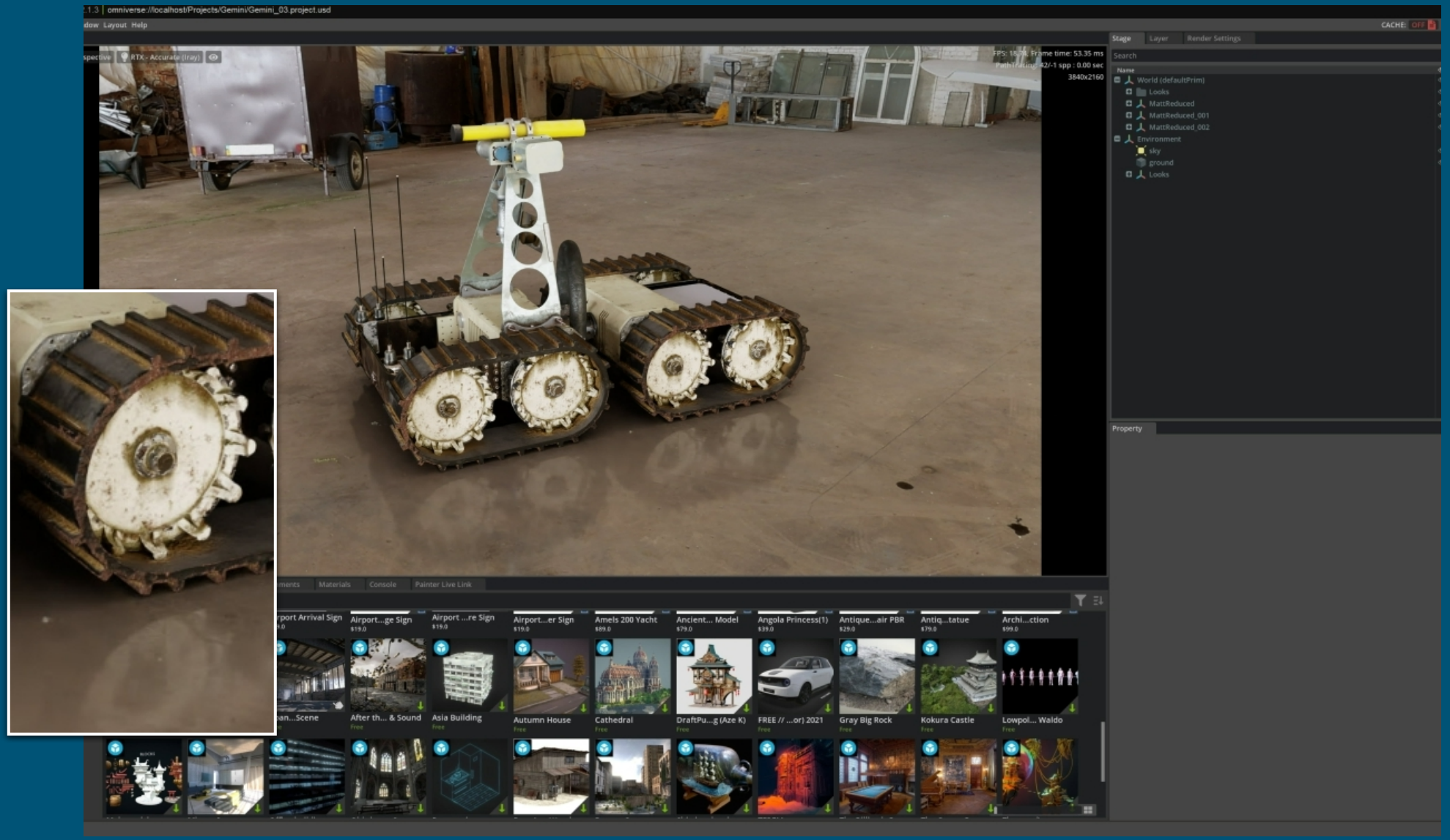
Omniverse Create



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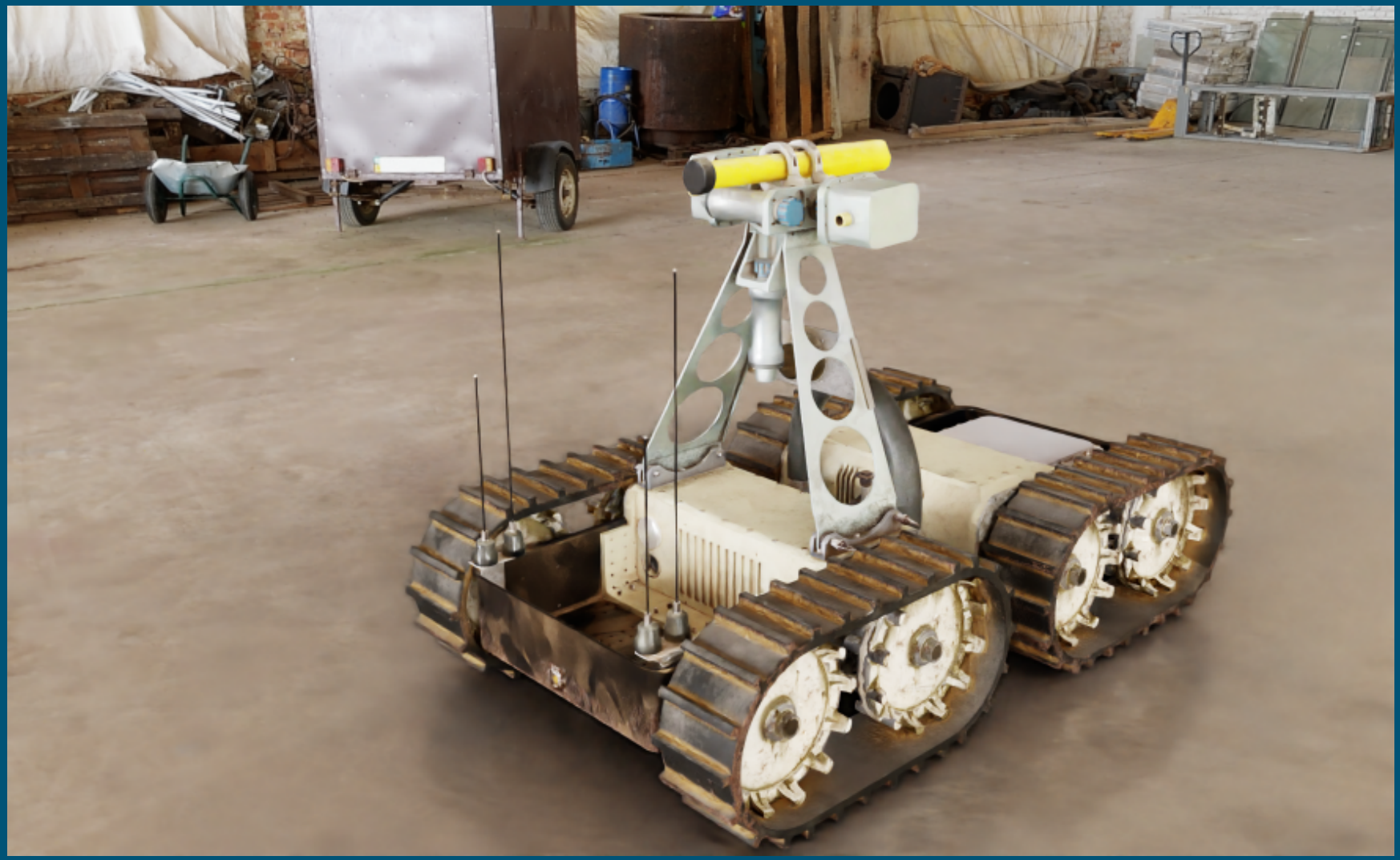
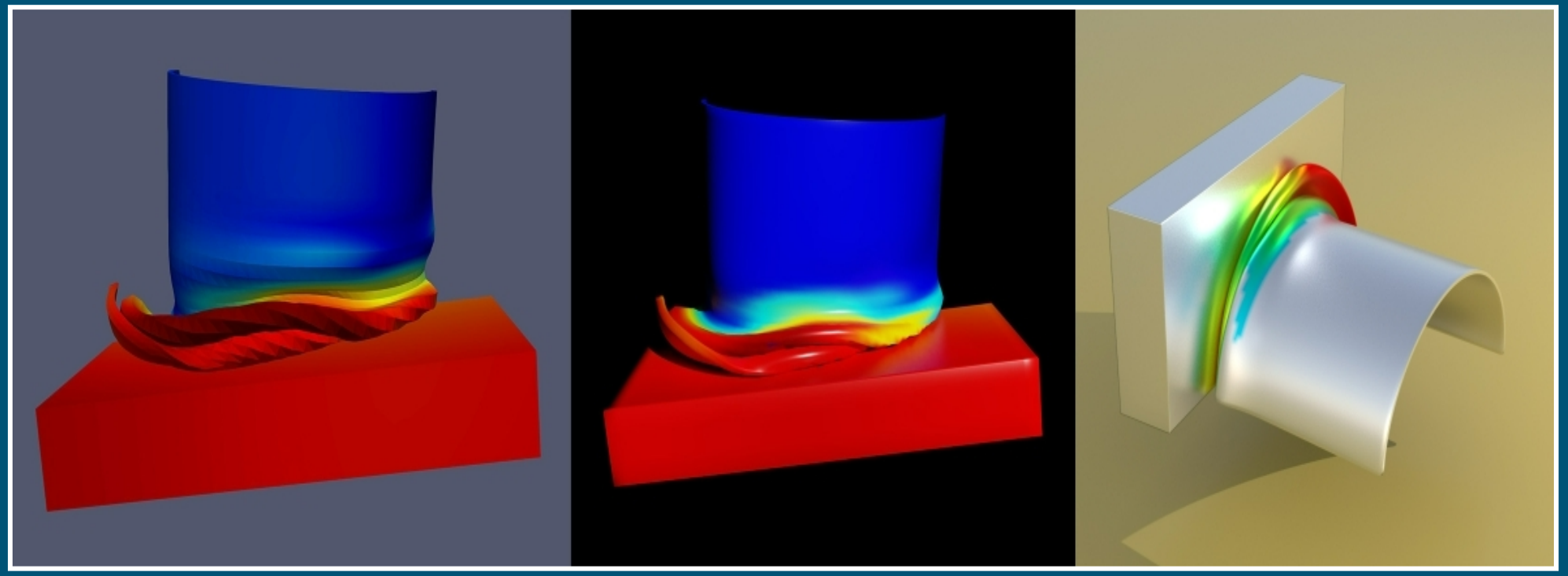
Omniverse Create

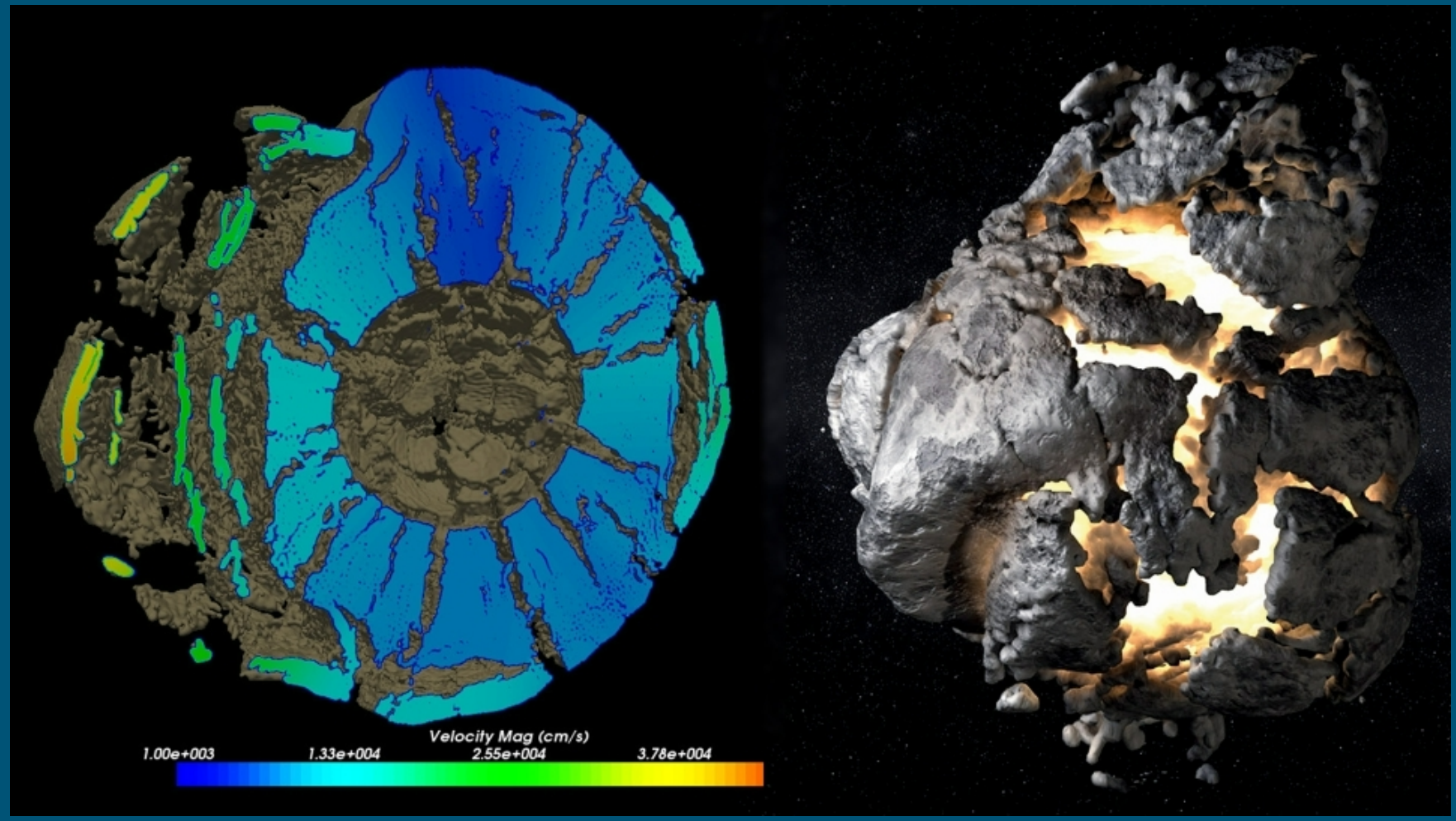


Paraview – Omniverse - Houdini



The NVIDIA Omniverse platform can be used to simplify the HPC impactful visualization creation pipeline. HPC simulation data is processed in Paraview using an open source Omniverse plugin. USD data is created and saved in a project folder. That data can be rendered with multiple GPUs, using the Omniverse Rendering application or read by Houdini for further processing.

Golevka Visualizations



Generated from the same data

Creating Impactful Visualizations with Omniverse

- Omniverse Paraview Connector translates simulation data
- Houdini reads and manipulates the simulation data
- Omniverse Create application enhances Houdini simulation data
- Omniverse XR displays the simulation data in AR and VR

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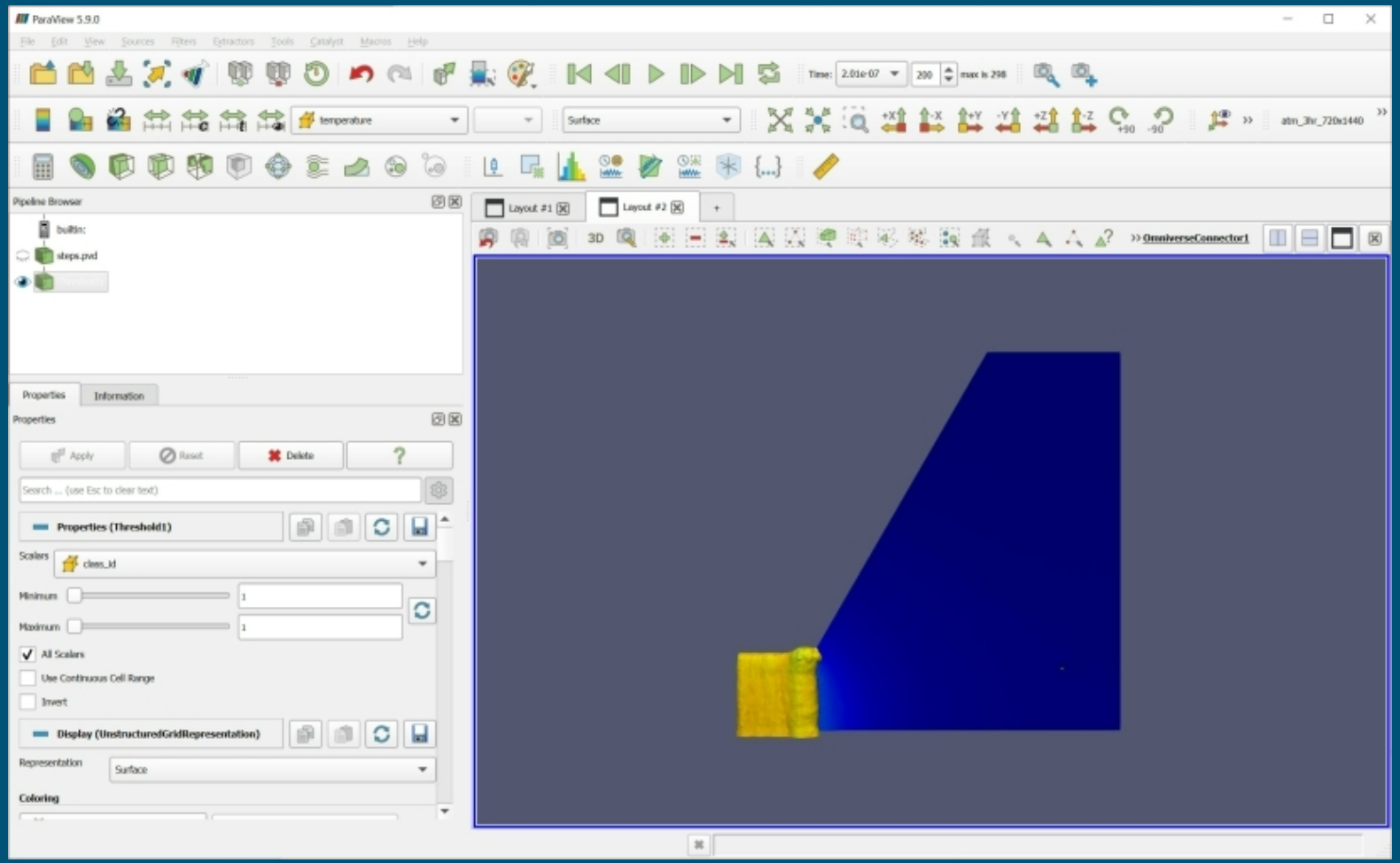
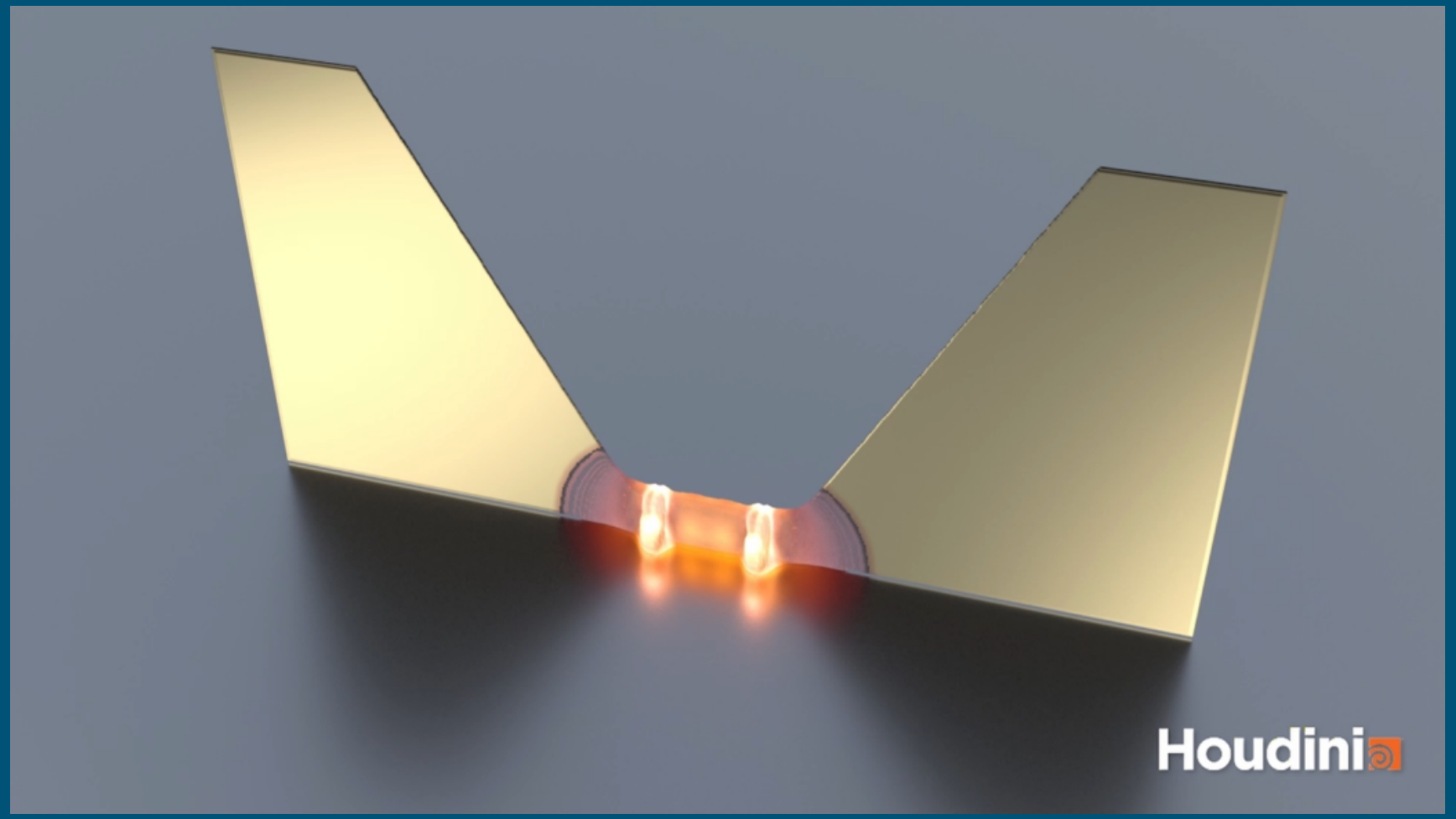
Omniverse Paraview Connector



Omniverse Paraview Connector translates simulation data

Houdini

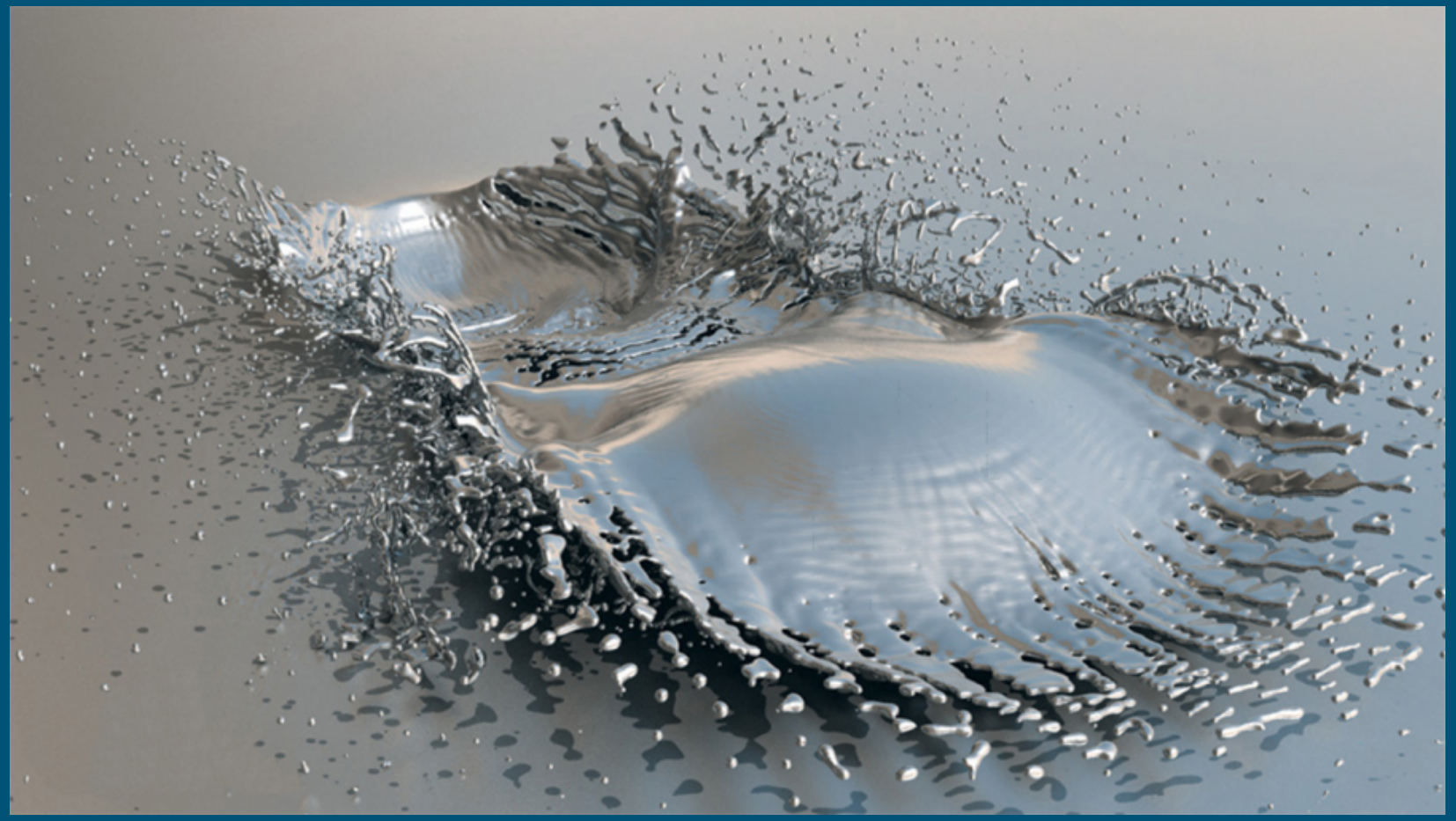


Houdini reads and manipulates the simulation data

Omniverse XR

iPad Screen Capture. Viewing USDZ file downloaded to iPad.

Omniverse XR



CTH simulation of an aluminum ball hitting an aluminum block at high speed. With Omniverse XR viewing this data with reflections should be possible.

Importance of Texturing

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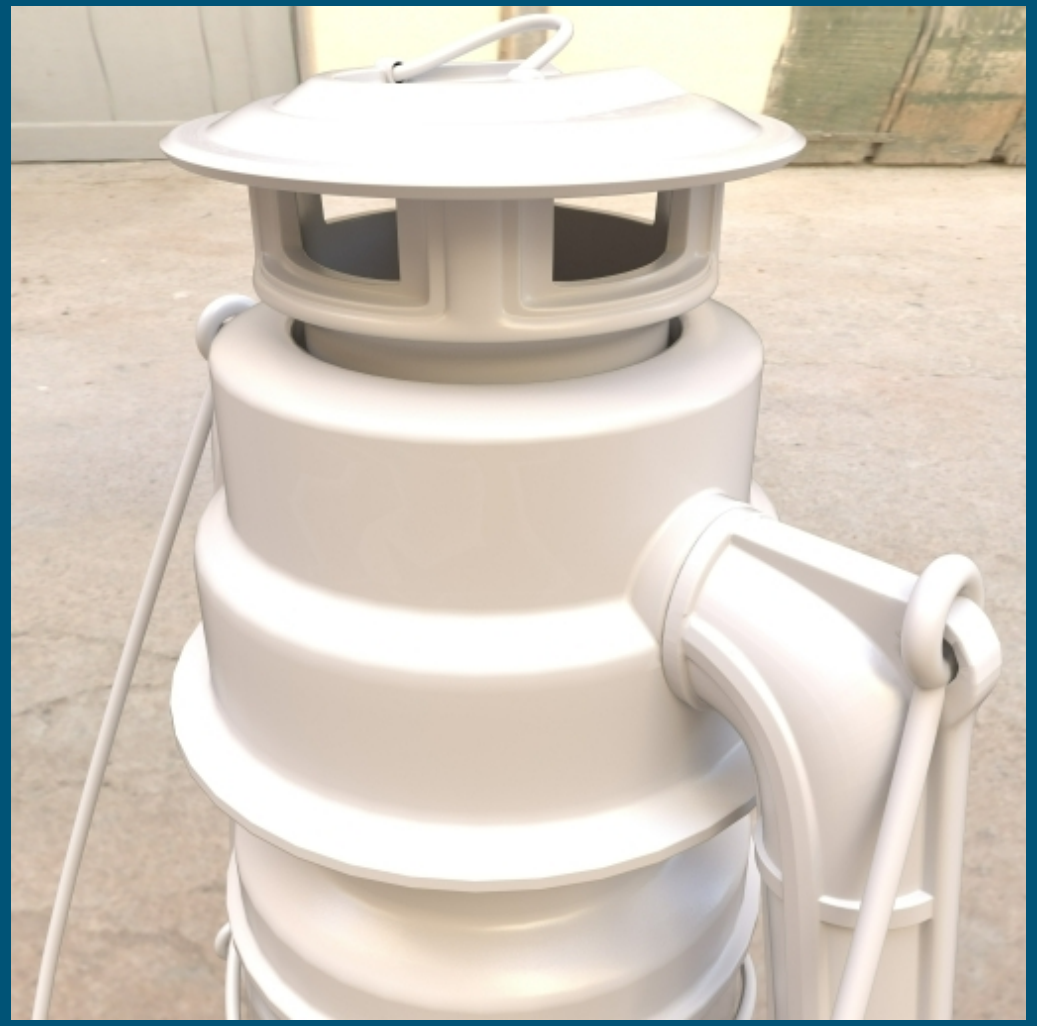
Simple Object

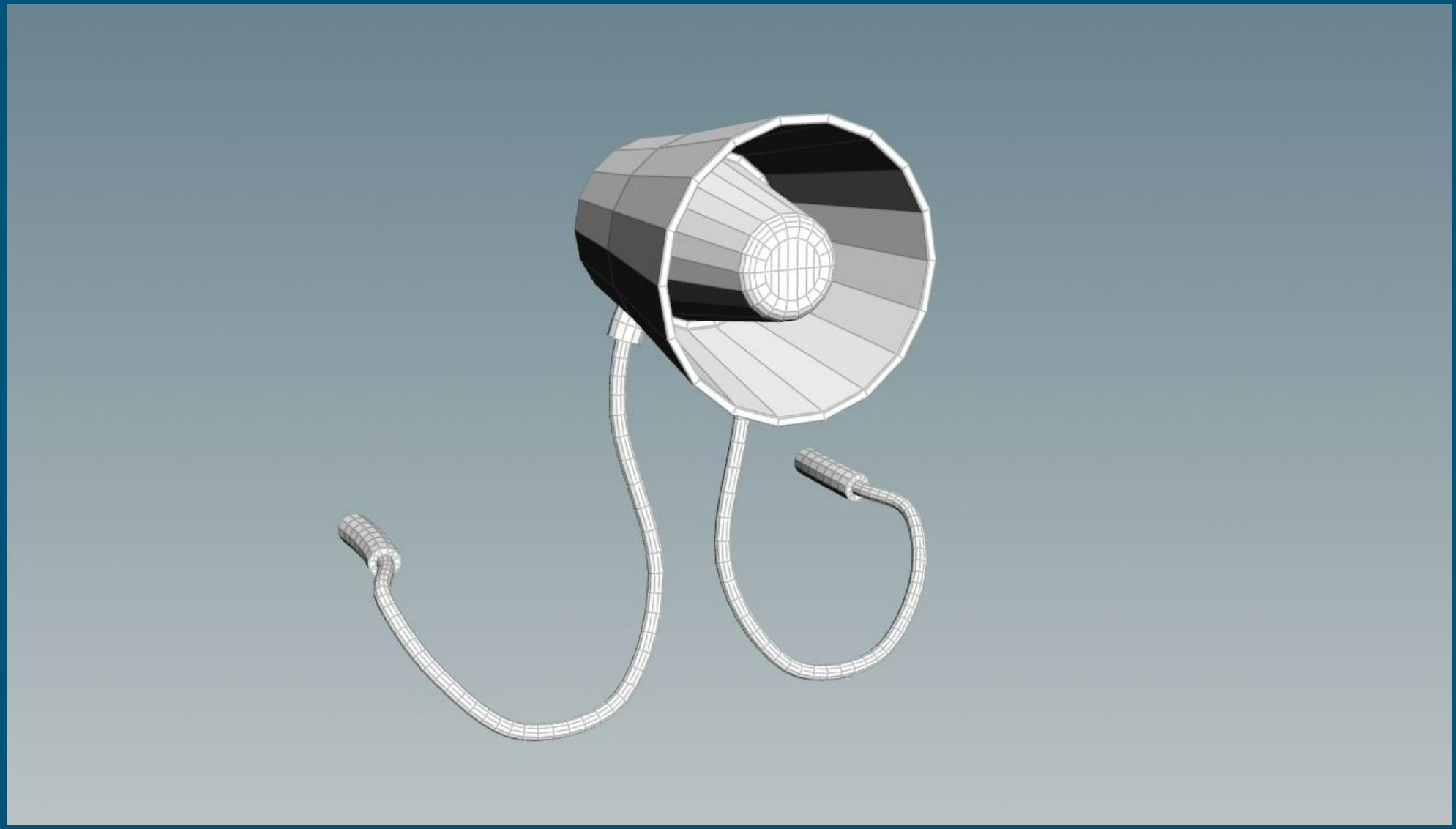
Simple Object Textured

Simple Object Textured

Real Time Textures



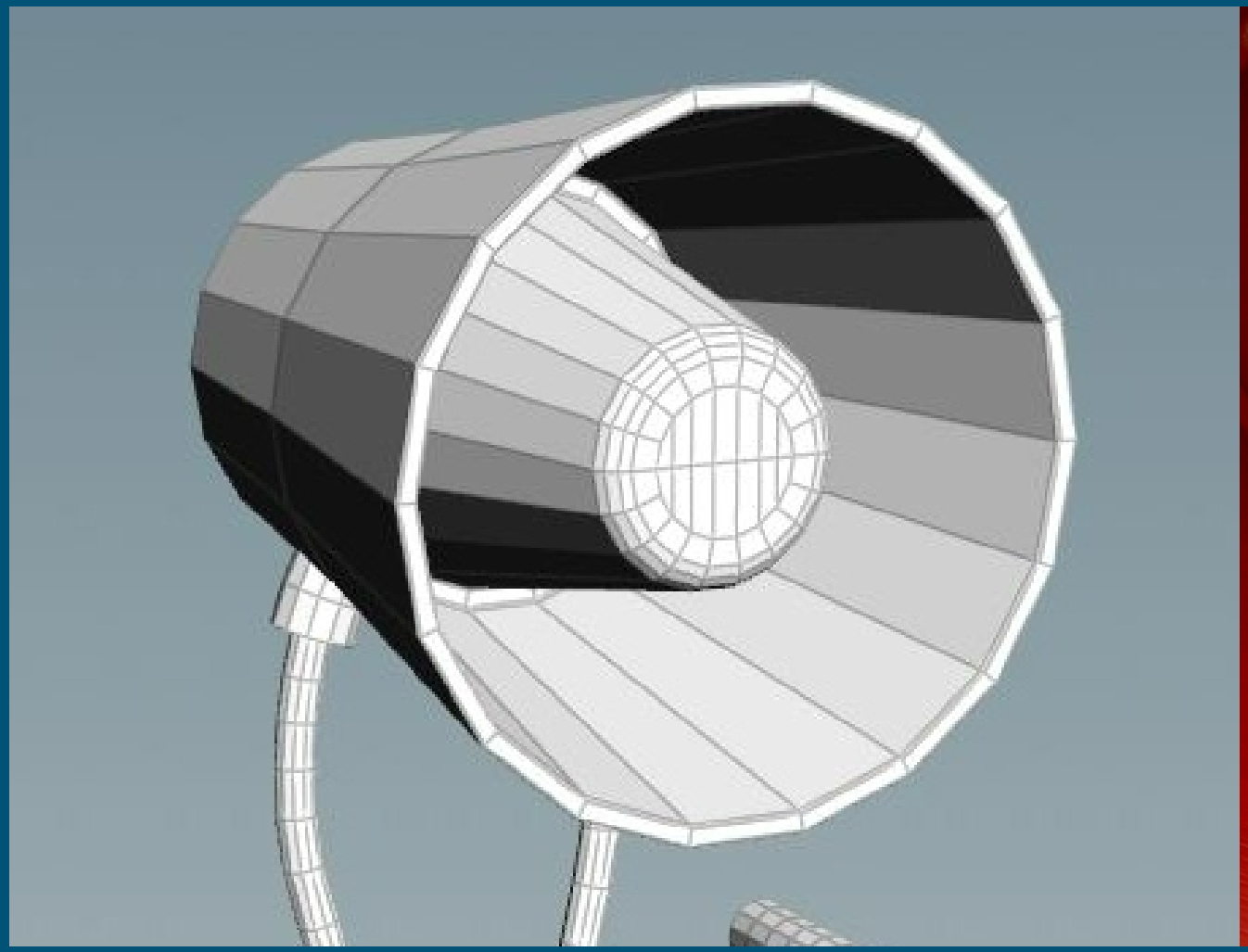
Loudspeaker



Loudspeaker Textured

Loudspeaker Close Up

Real Time Textures



High Bay VR screen shot

Quest 2 Screen Shot from Half Life Alyx Game

Gestures and hand tracking

Oculus Quest 2

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