VOLUMETRIC VIDEO // PLENOPTIC LIGHTFIELD // MULTI CAMERA METHODOLOGIES

JORDAN HALSEY // VR PLAYHOUSE

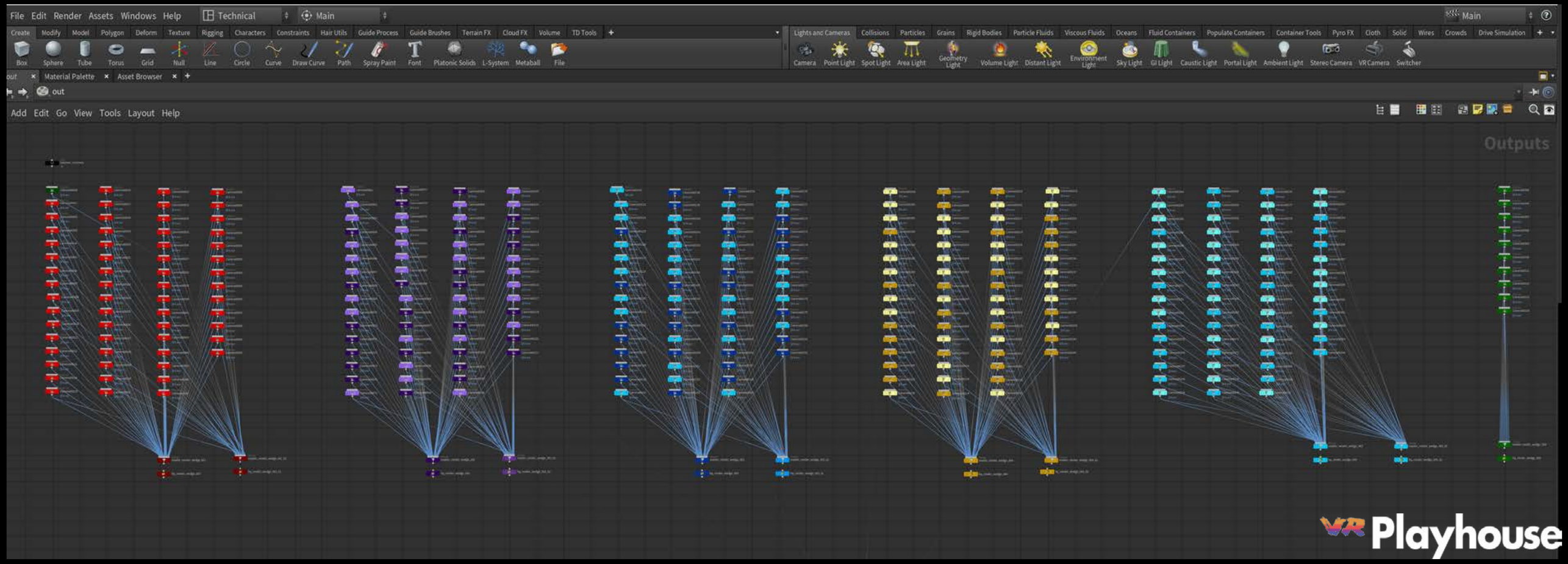
VOLUMETRIC VIDEO // PLENOPTIC LIGHTFIELD // MULTI CAMERA METHODOLOGIES

Pro: Highly realistic seated viewing experience
Large lighting datasets
Reflections and refractions behave as n the real world

Con: Extremely large datasets
Playback is view dependent

Cgi integration and post effects need to be rendered with exact camera matching

Rendering, rendering, rendering...
Complicated file structure



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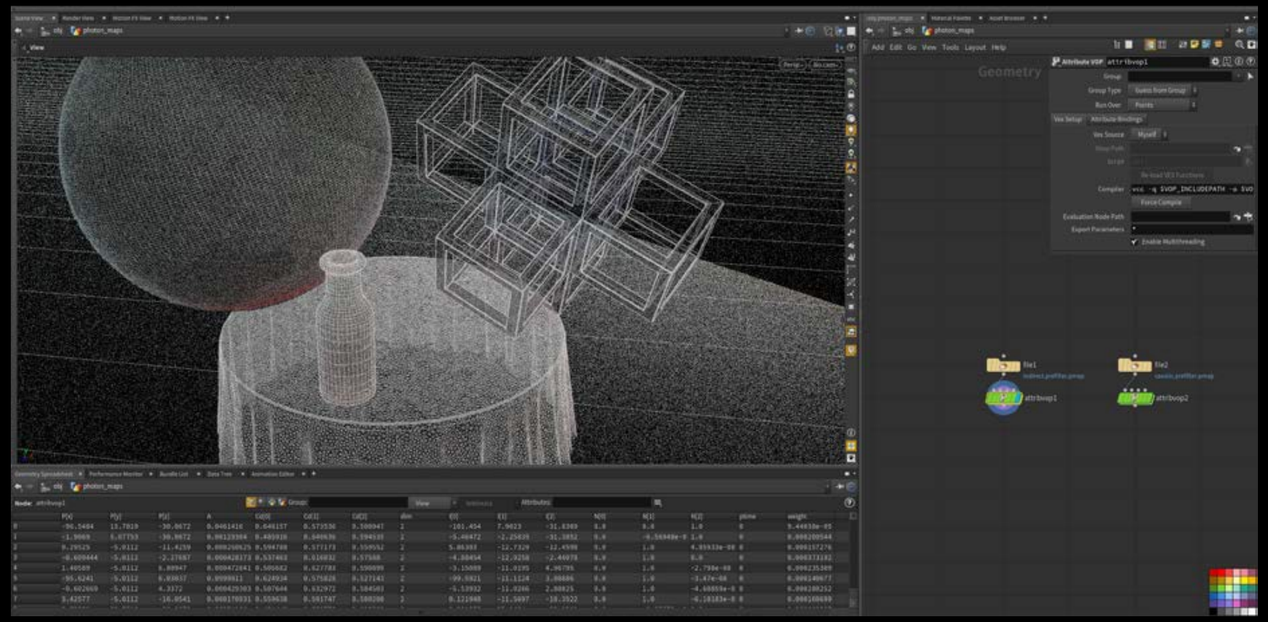

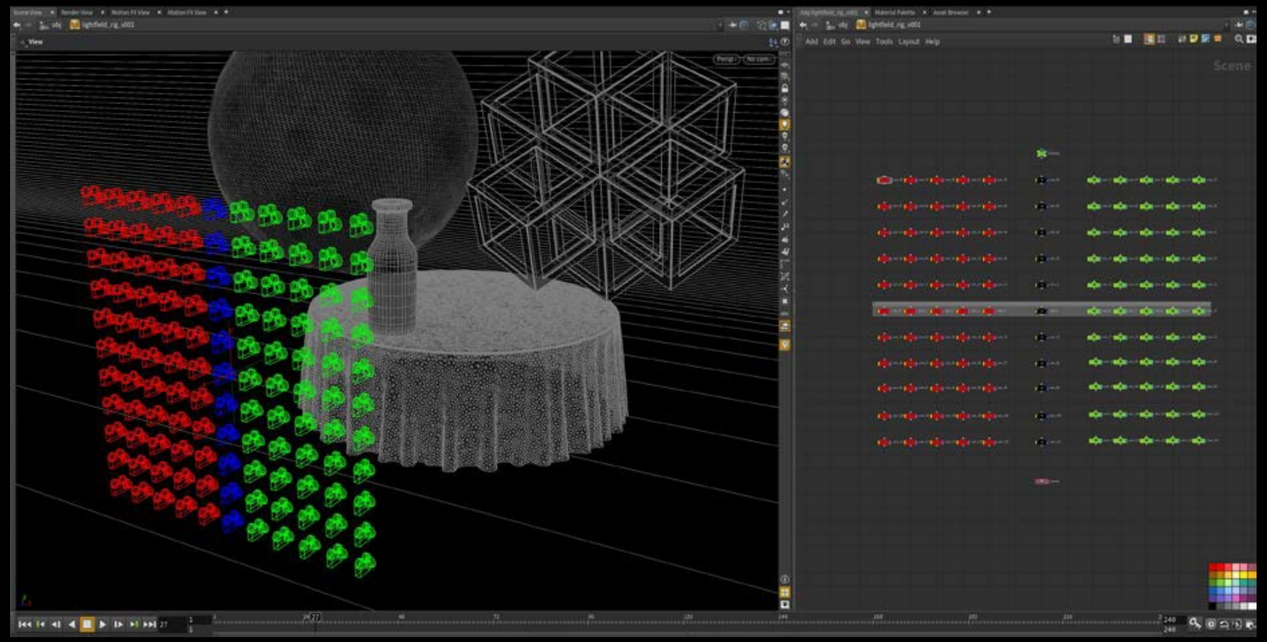

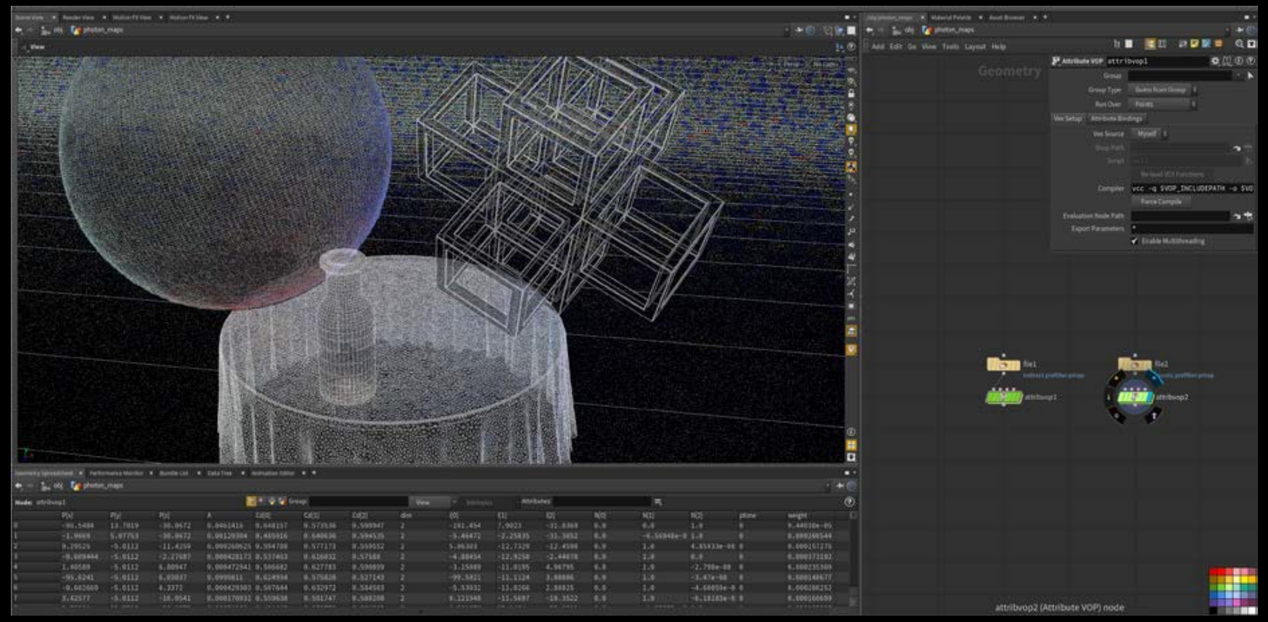

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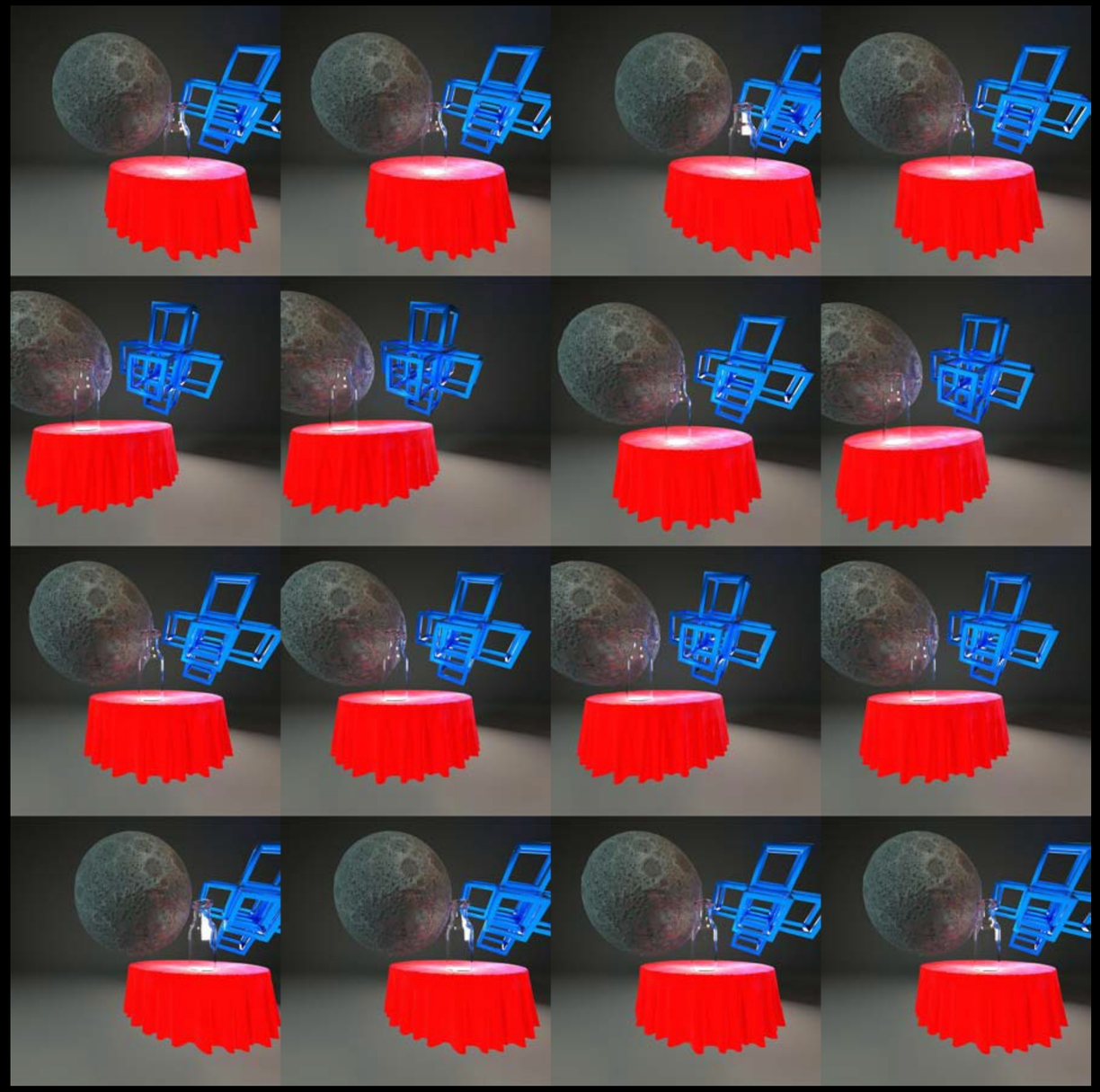

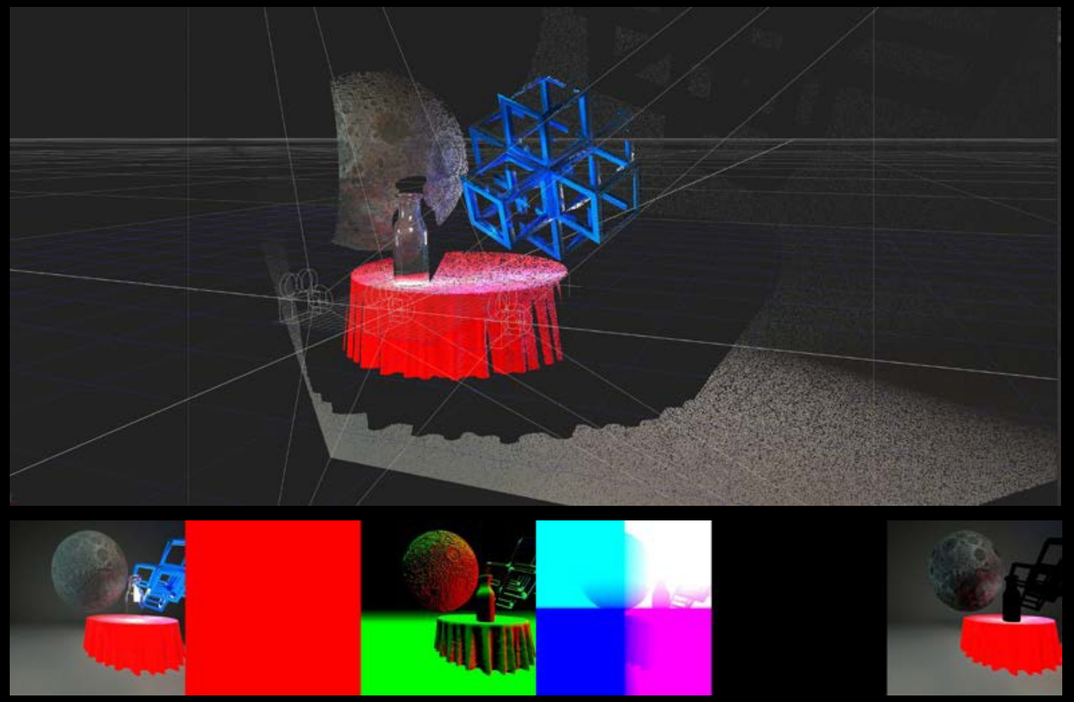

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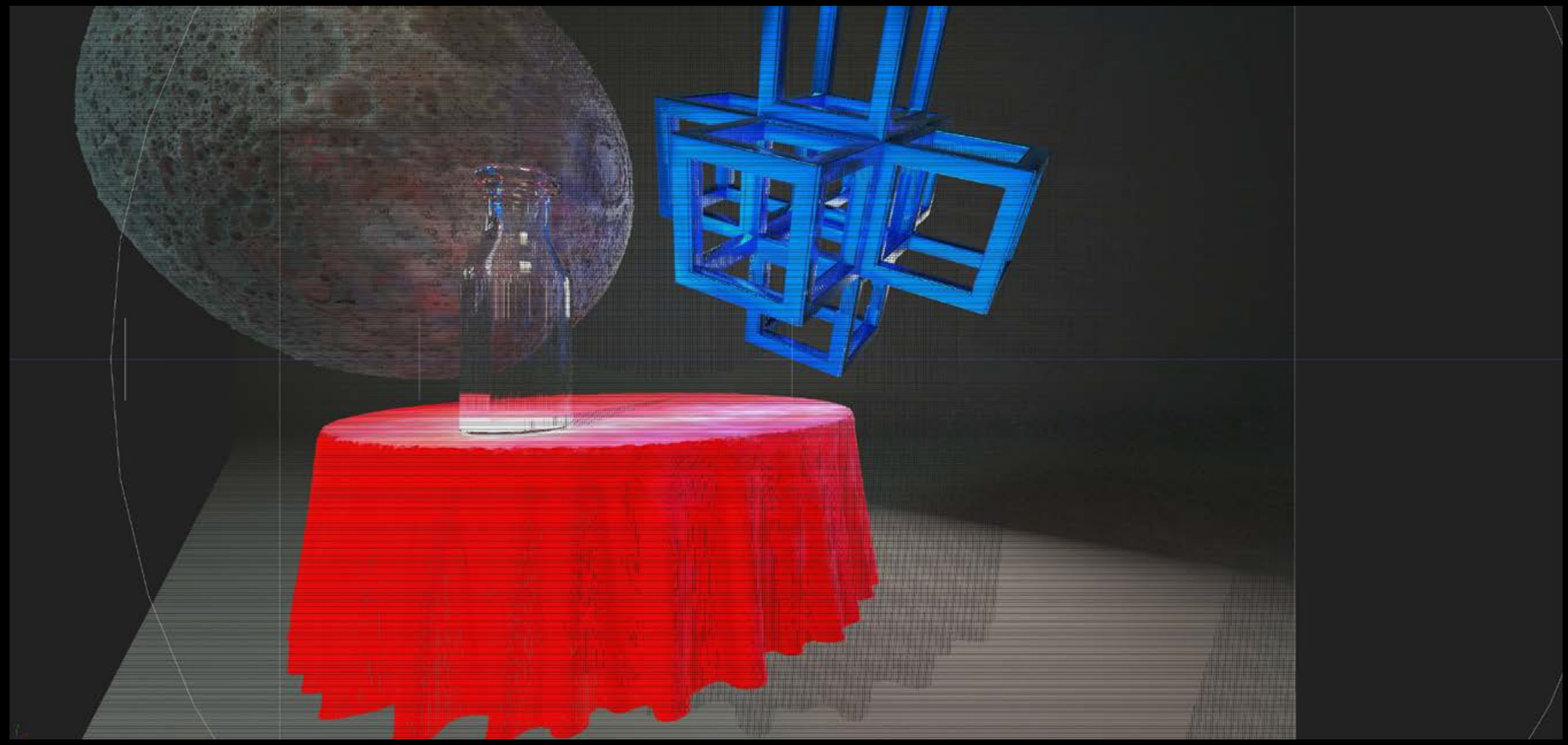
Lightfield, as we know it will never be other than a view dependent solution

Combining Lightfield for volumetric reconstruction

Specular/Reflection information based off per camera calculations
View Dependent



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GEOMETRY RE-CONSTRUCTION // LIDAR DATA // PHOTOGRAMMETRY

Geometry reconstruction techniques
Filling in missing or incomplete data
Photogrammetry for object re-construction

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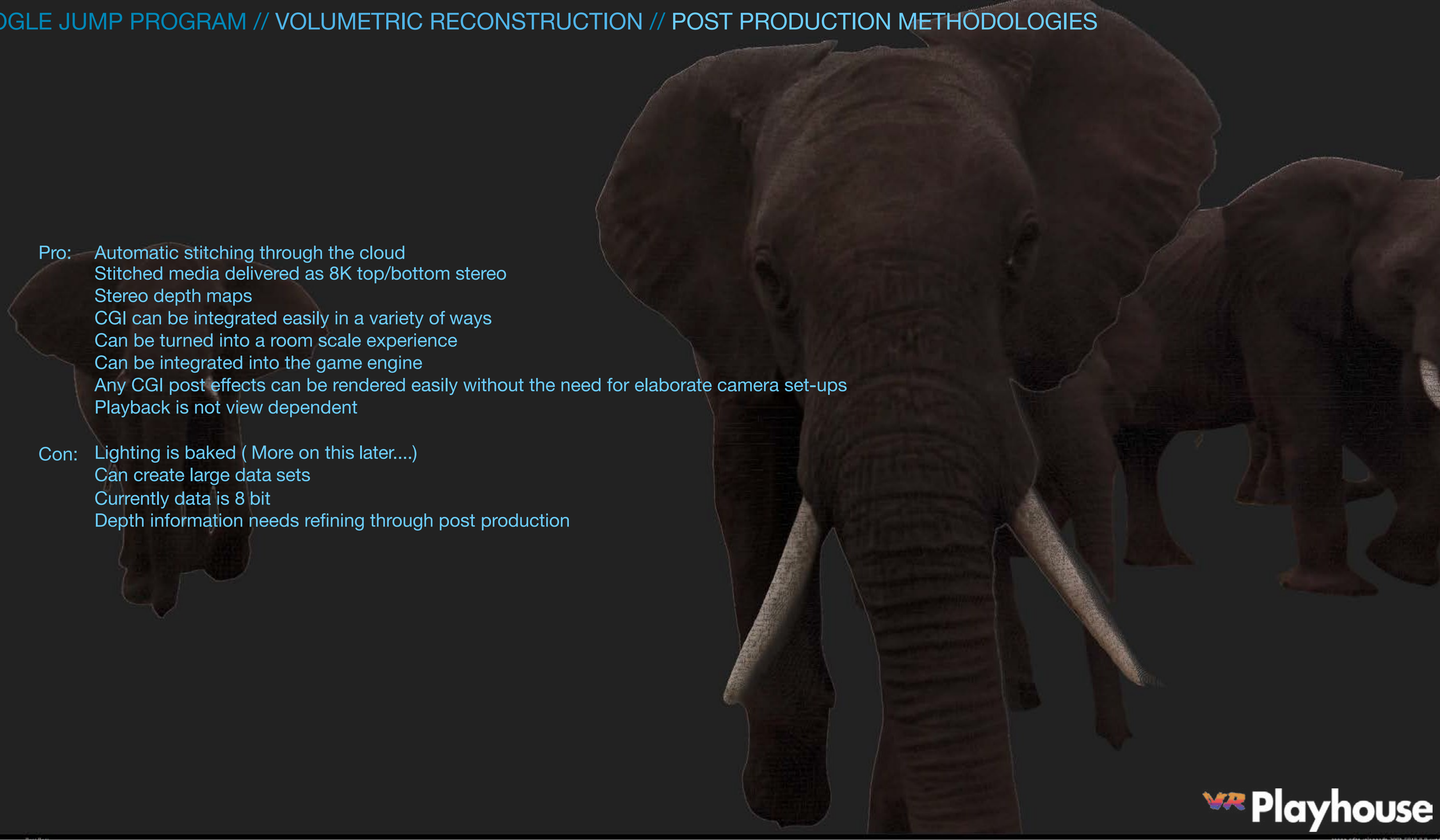

Pro: Automatic stitching through the cloud
Stitched media delivered as 8K top/bottom stereo
Stereo depth maps
CGI can be integrated easily in a variety of ways
Can be turned into a room scale experience
Can be integrated into the game engine
Any CGI post effects can be rendered easily without the need for elaborate camera set-ups
Playback is not view dependent

Con: Lighting is baked (More on this later....)
Can create large data sets
Currently data is 8 bit
Depth information needs refining through post production

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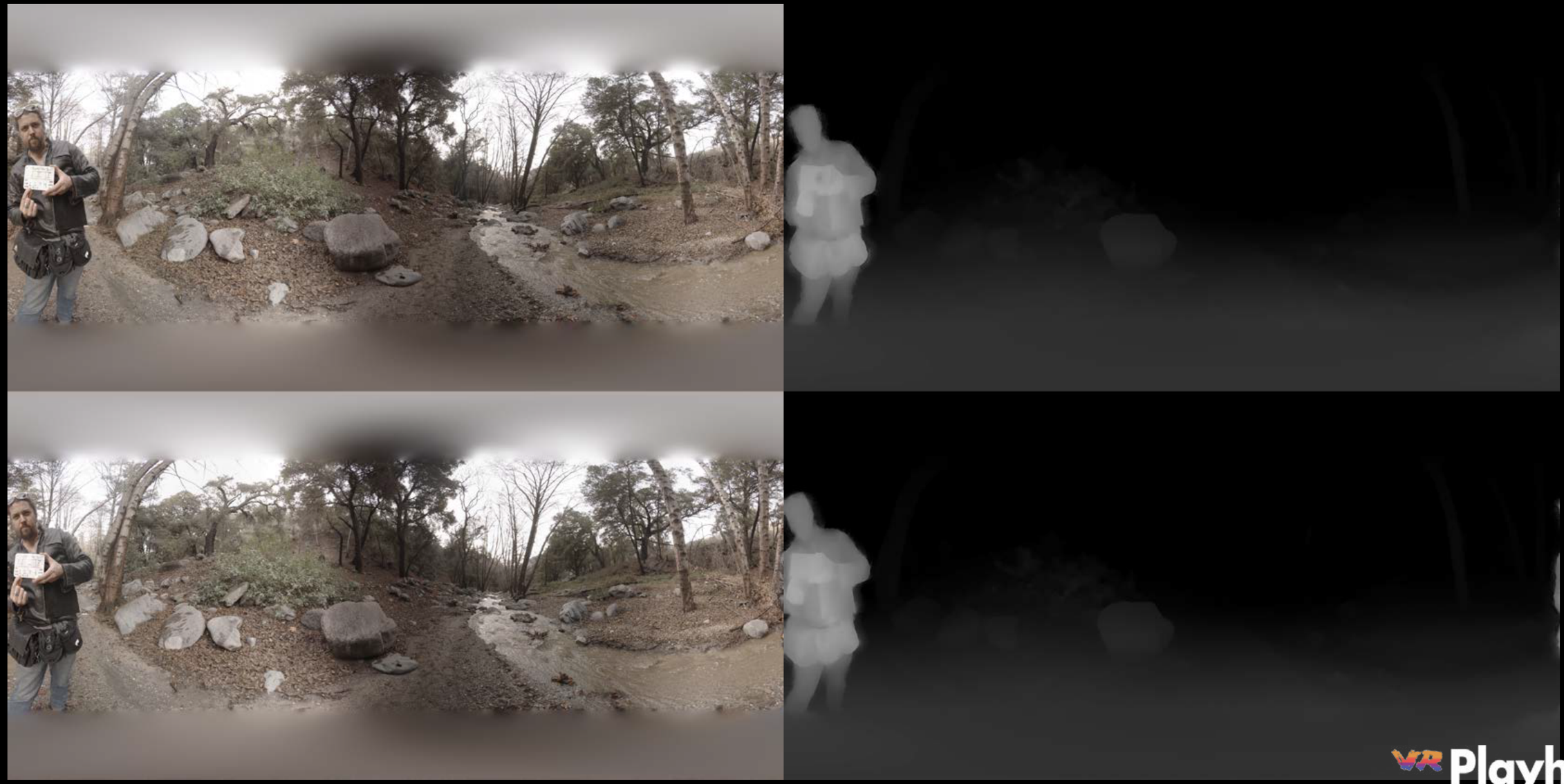
Top/Bottom stereo
Nadir fixes
Depth clean up



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Volumetric reconstruction pre-processed and post-processed.

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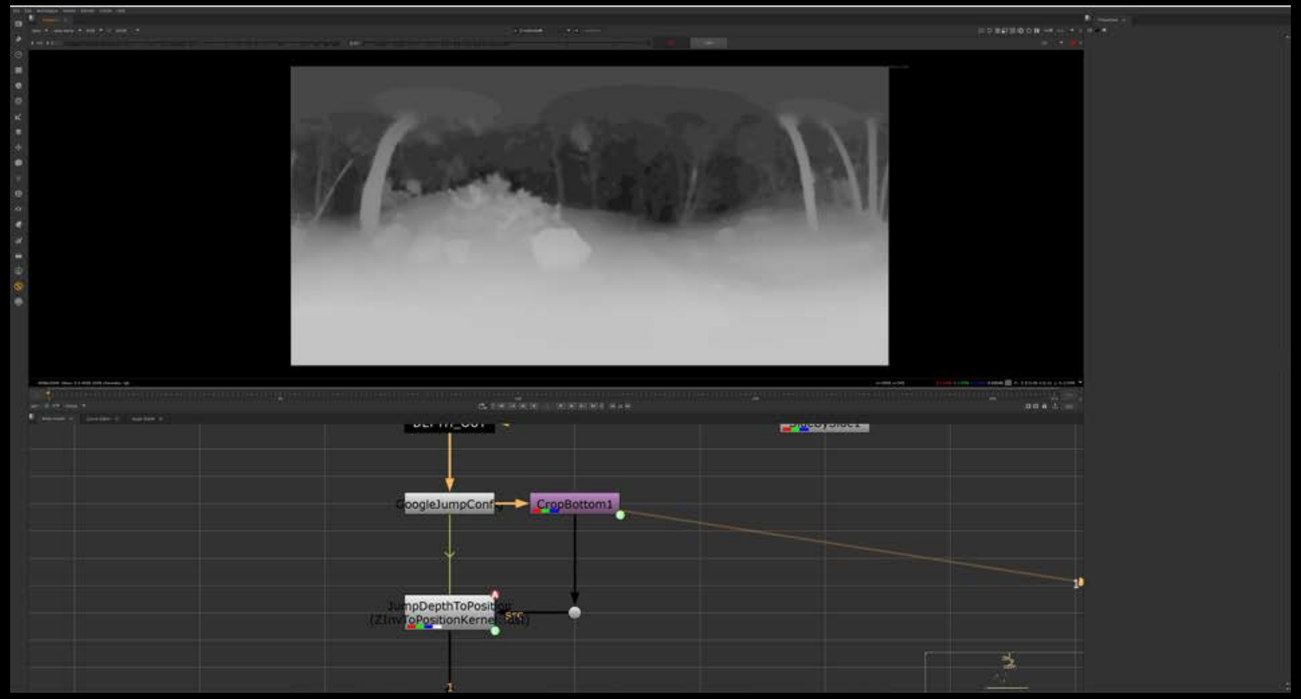
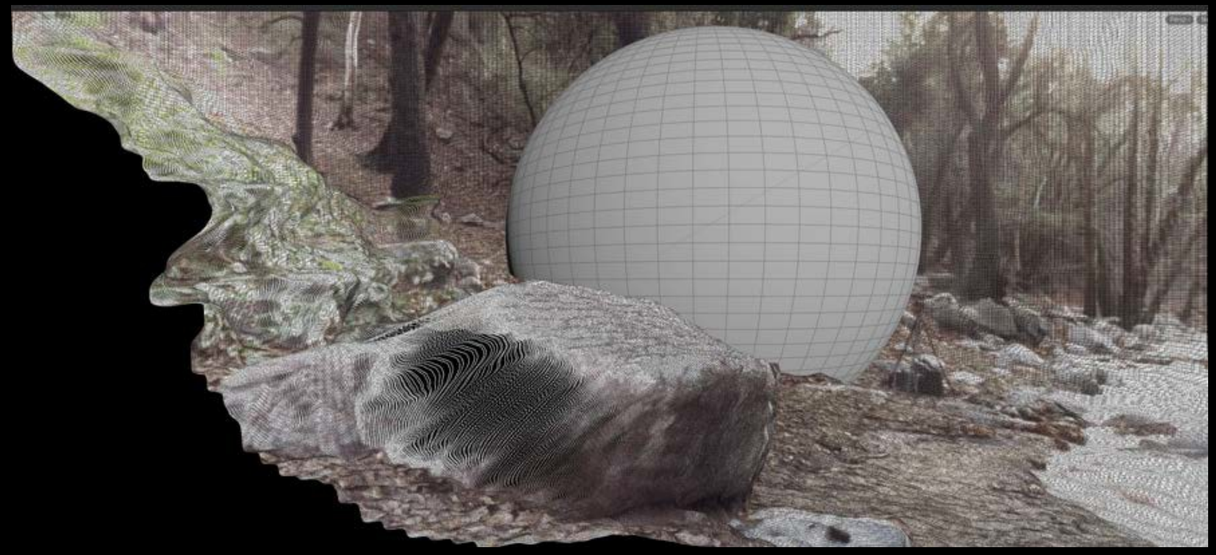
Over corrected right eye depth map

A sphere integrated with the volumetric video





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Distance based scale correction
Can be embedded as an attribute on the data for playback

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INTEGRATED CGI // DEEP BASED COMPOSITING

Deep based compositing techniques for cgi integration
Spatial rectification between the lat-long world and the cgi world
Matching z-depth for correct stereo between cgi and shot lat long

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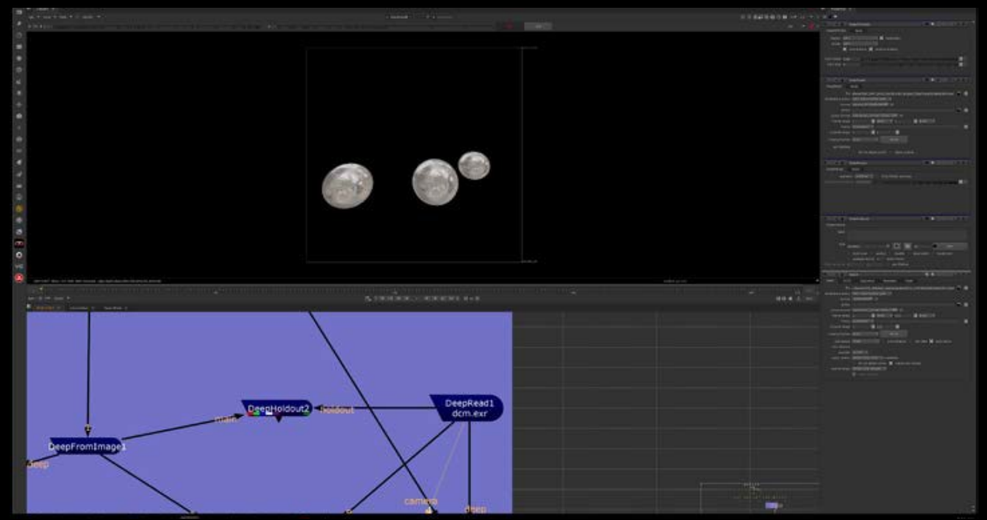
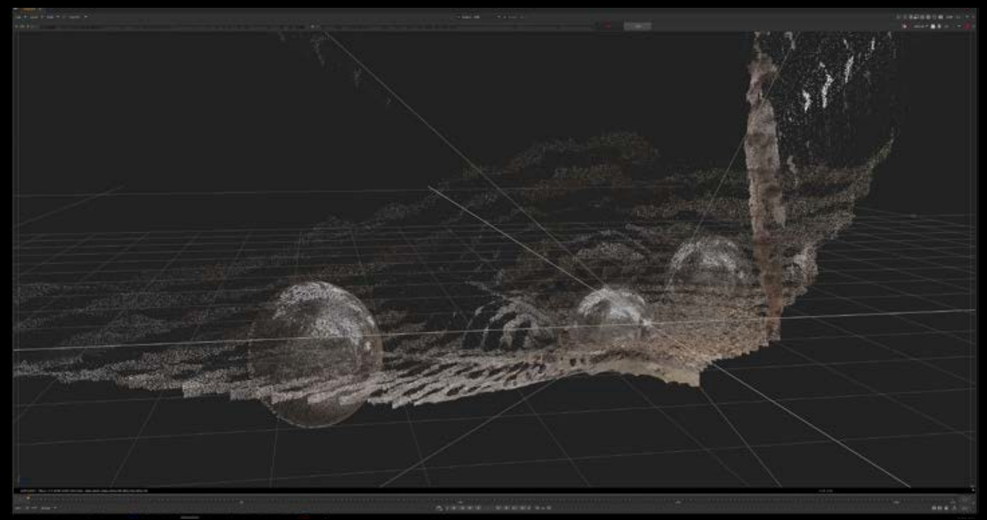
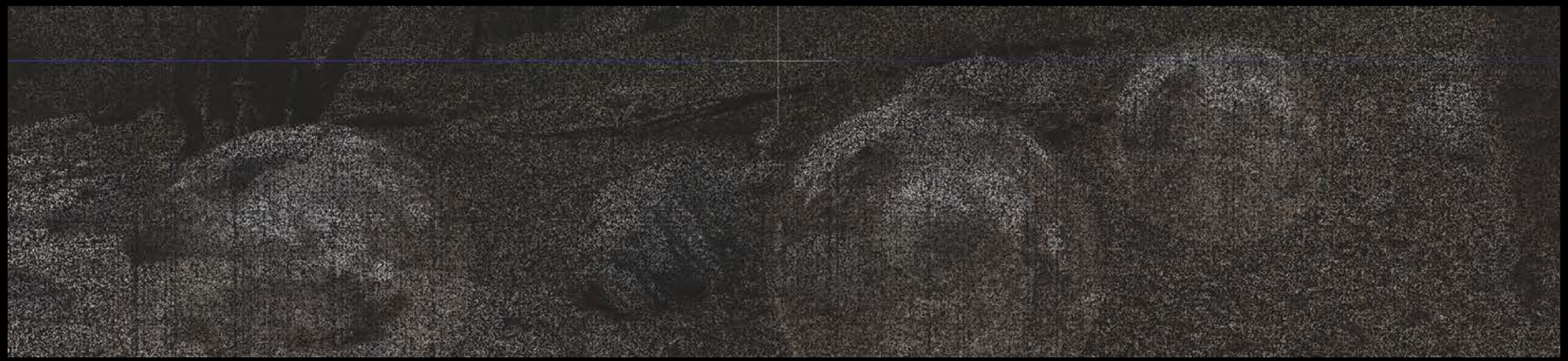
Deep re-construction in for CGI Integration

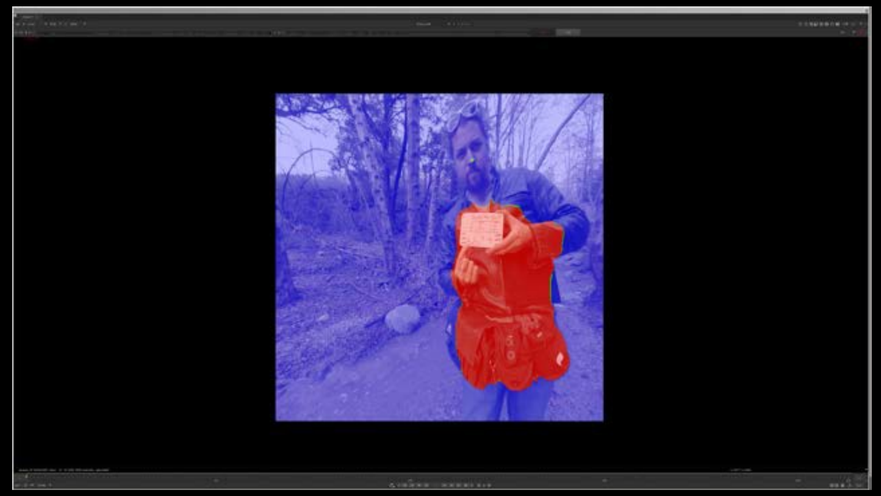


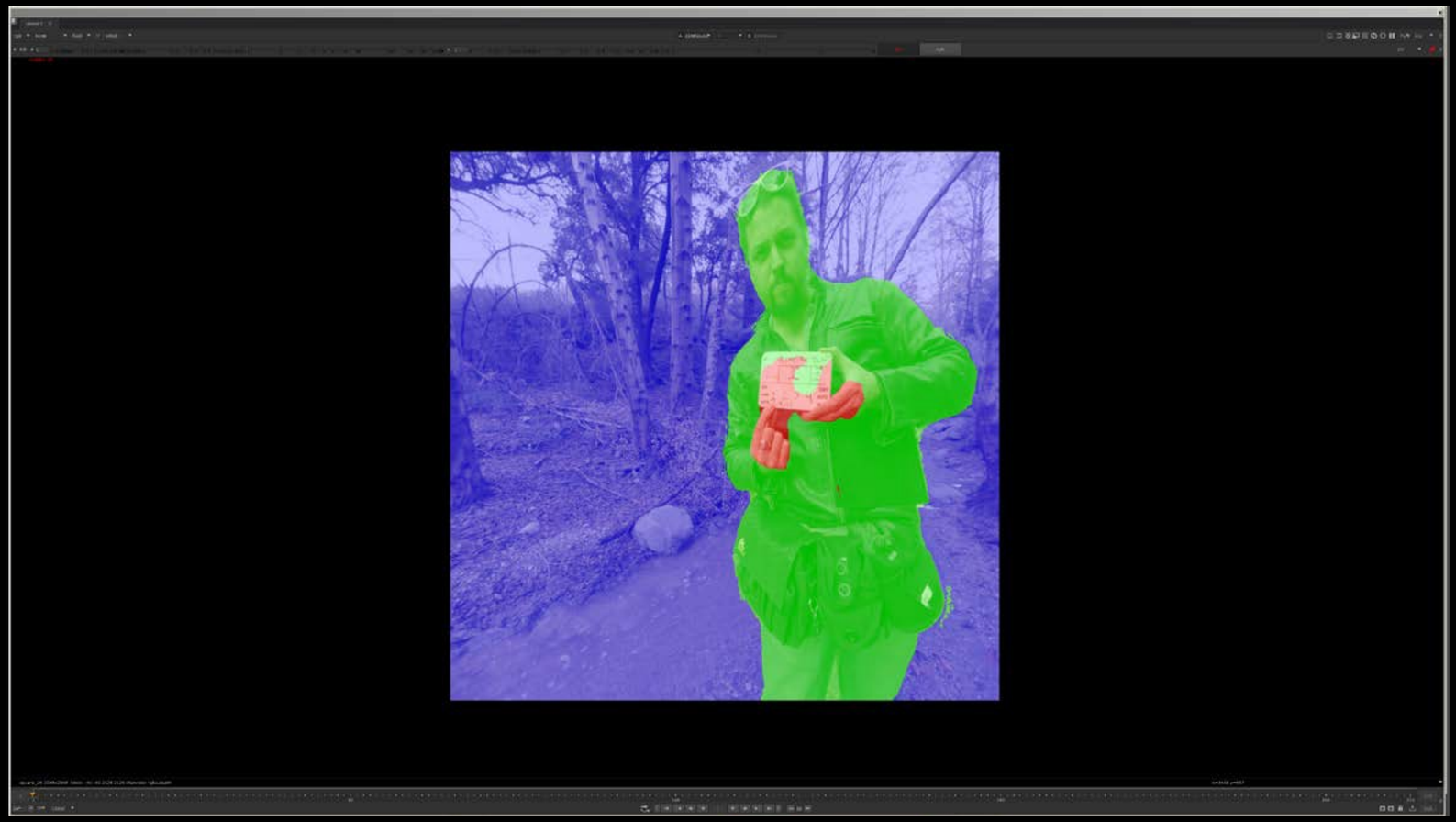




OBJECT EXTRACTION AND ISOLATION THROUGH DEPTH SLICING

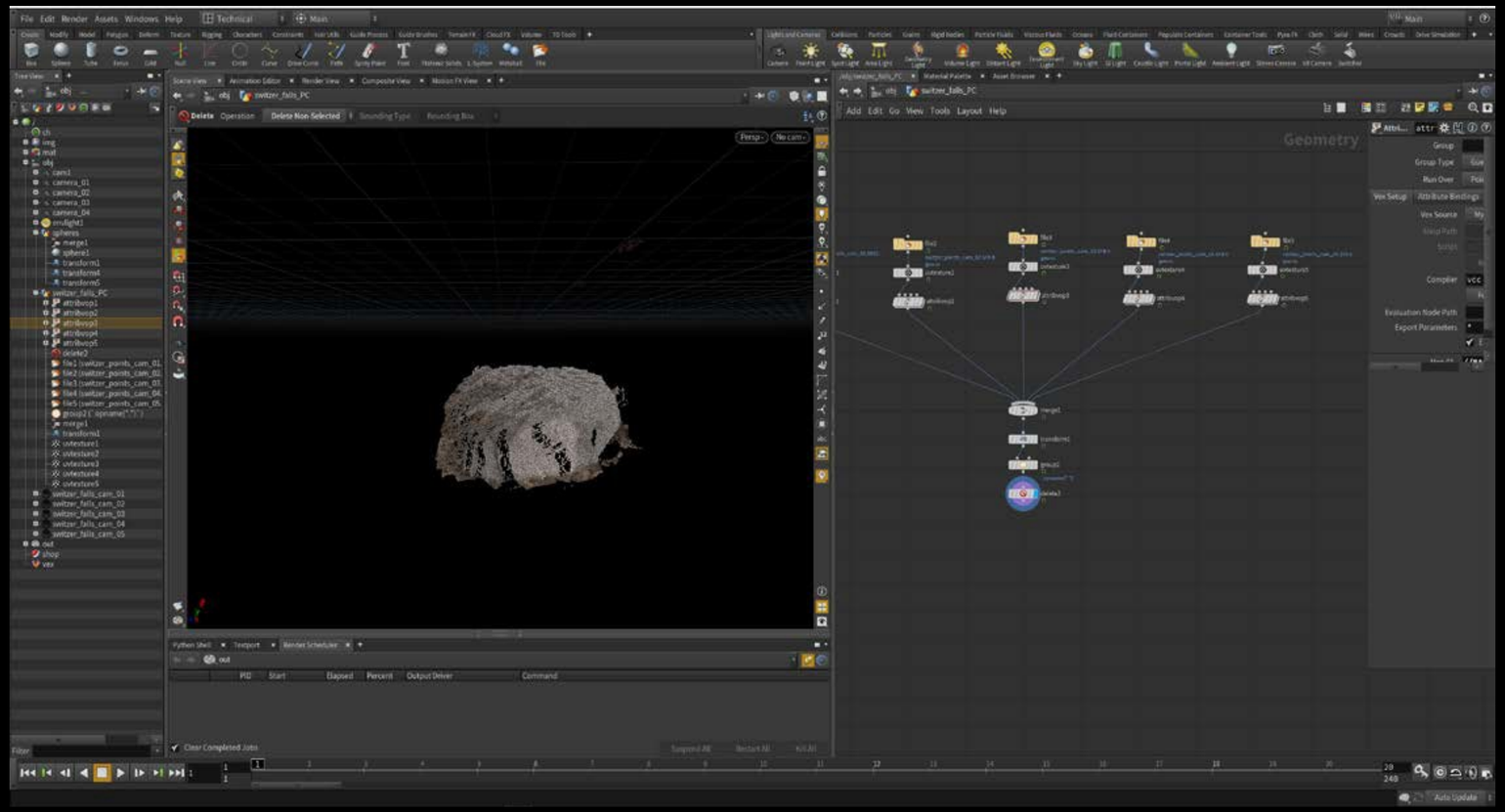
Automatic z through depth data
Altering depth of field
Re-lighting effects through normals





GEOMETRY RE-CONSTRUCTION THROUGH POINT CLOUD MESHING AND TEXTURE RE-PROJECTION

Using the data for geometry isolation
Using the data for geometry creation
Texture projection



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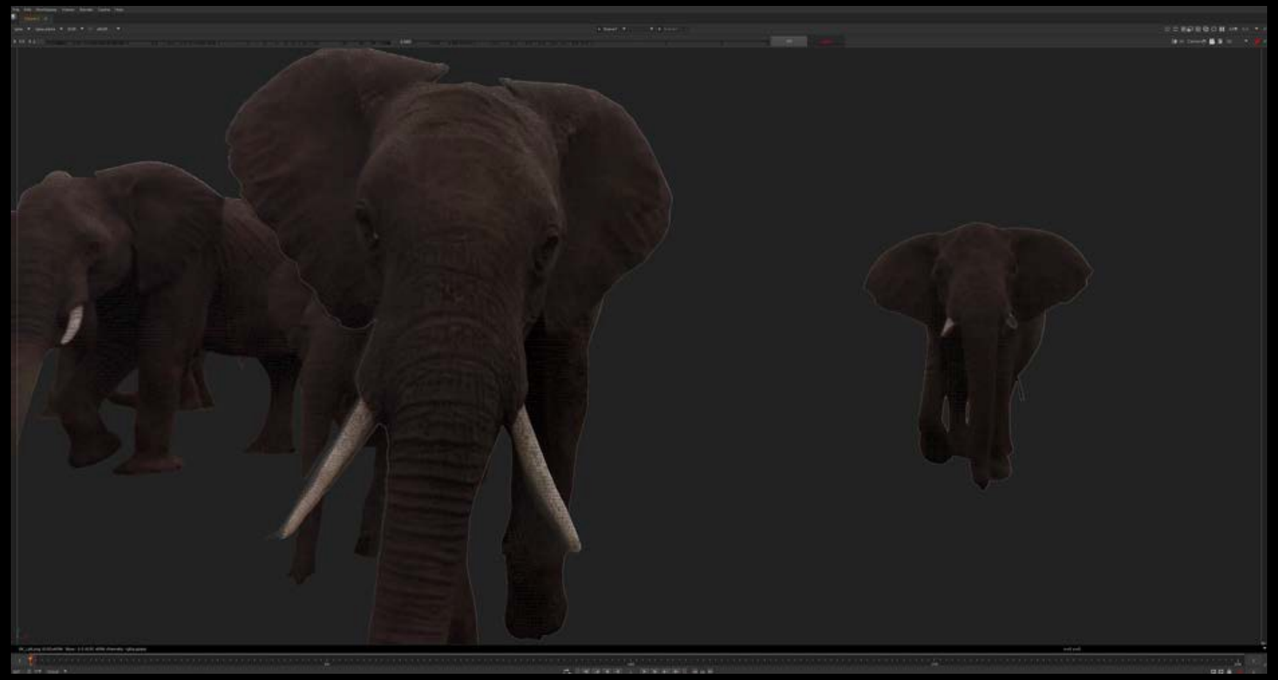
CGI Integration with Stereo footage from the Google Jump program



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Object isolation for integration with CGI

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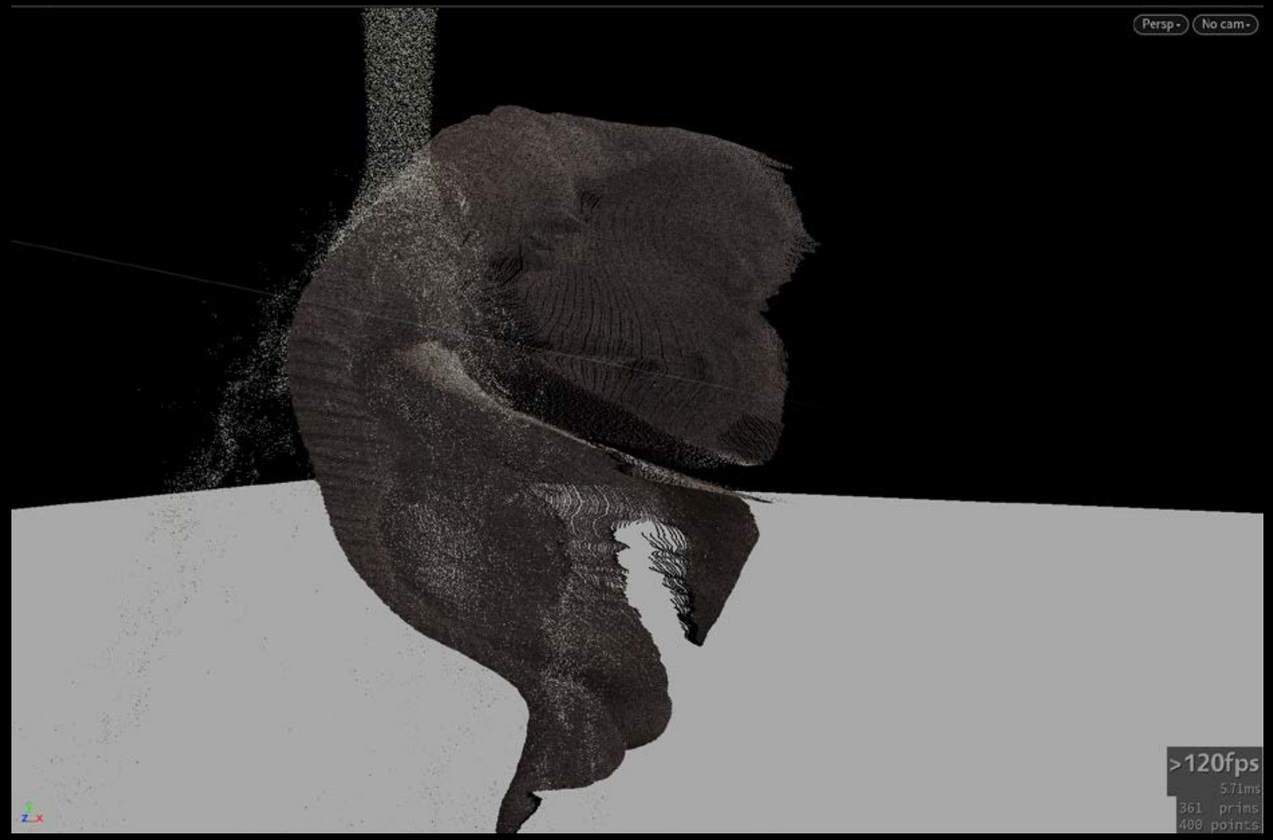
Fluid interaction with collisions



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GOOGLE JUMP PROGRAM // VOLUMETRIC RECONSTRUCTION // DE-LIGHTING

Using the provided environment we are able to sample the diffuse lighting contribution
With the provided lighting contribution we can project a ray on the data

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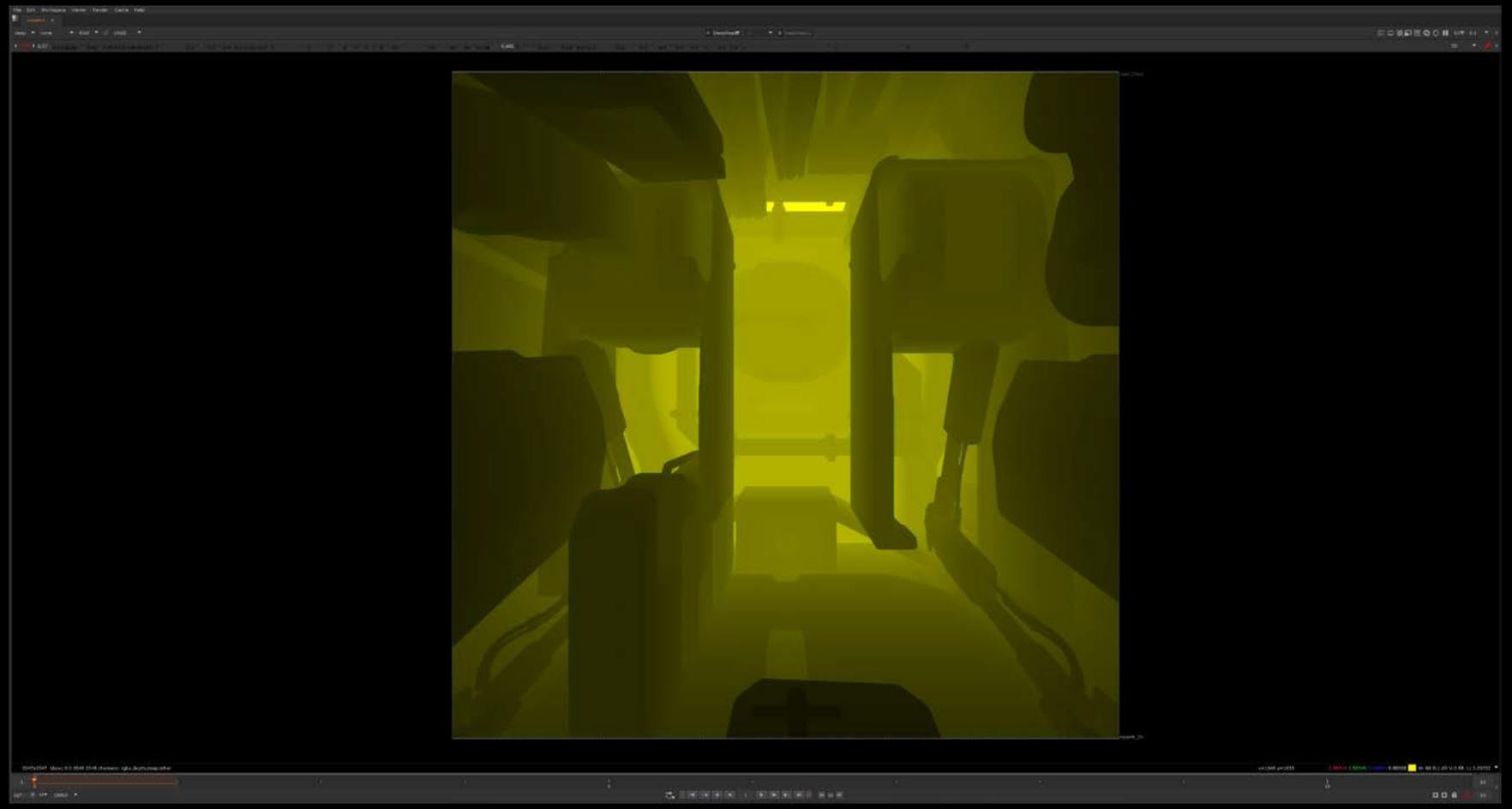
DEEP RENDERING // VOLUMETRIC RECONSTRUCTION // POST PRODUCTION METHODOLOGIES

Using deep renders for volumetric reconstruction
Deep represents multiple float values per pixel



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