Exploring Shadows Through OpenSpace: Creating 3D Visualization Assets and Simulations

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Data Collection
- Gathered KMZ files that uses NASA's FIVE MILLENNIUM CATALOG data on solar eclipses to create eclipse paths and ensure correct simulations.

Coding Assets
- Developed coding that calculated and rendered an ecliptic plane with nodes and 3D cone-shaped shadows of the umbra and penumbra.

3D Modeling and Rendering
- Used 3D modeling and rendering to visually portray the moon's shadow, moon's orbit, ecliptic plane and nodes during a solar eclipse.

Visualization Development
- Developed interactive, immersive simulations and animations showcasing solar eclipses with a captivating travel-along experience.

Methodology: Creating Immersive 3D Solar Eclipse Visualization Assets

Total/Partial Eclipse
- Annular "Ring of Fire" Eclipse

OpenSpace 3D Simulation Results

Discussion
In summary, we have developed simulation and visualization assets using OpenSpace to provide a captivating and immersive opportunity to travel along with the moon's shadow to explore and understand this celestial phenomenon. The integration of OpenSpace into this project has allowed us to share this knowledge with others by creating 3D visualization assets that can be displayed on a computer at home or your local planetarium. The immersive and interactive nature of OpenSpace makes it a robust tool for educational outreach by engaging and captivating audiences while instilling scientific knowledge.