Research Challenge

- Visualize supercomputer datasets in a cinematic way while maintaining scientific accuracy
- Few existing tools handle both cinematic animation and scientific visualization

Methods & Codes

- yt, a scientific analysis and visualization package for Python
- Houdini, a visual effects tool
- Created middleware and a pipeline to connect yt and Houdini named Ytini.
- Created a Python tool named Blurend to prepare Houdini scene files for rendering on Blue Waters.

Results & Impact

- Rendered “First Light in the Renaissance Simulations” in 4k stereoscopic and planetarium dome formats.
- Rendered “El Reno 2011 Tornado” in 4k planetarium dome format.
- Processed data on Blue Waters for “Cosmic Bubble Bath” for the documentary “Seeing the Beginning of Time” (available on Amazon Prime)
- Processed data on Blue Waters for “Formation of the Moon” for a planetarium dome show.

Why Blue Waters

- Blue Waters reduced data preparation time from 4 days to 4 hours, speeding development of visualizations significantly.
- Blurend software, created for Blue Waters, facilitated rendering of “Seeing the Beginning of Time” and a tornado simulation in 4k planetarium dome format.
- Collaborators already used Blue Waters which made data transfer unnecessary, making things easier and saving time for scientists and visualization team.