

# Internet2 Collaboration Special Interest Group Focus on Virtual Reality



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# VR Collaboration Challenges

- Multidisciplinary research teams, composed of various domain scientists who use different domain-specific tools, would like them to interoperate, as they are all working on related areas of a larger problem.
- Scientists want to utilize a variety of display devices, from smartphones and head-mounted displays to conference-room monitors to room-sized immersive environments

Omegalib aims to tightly couple 2D/3D visualizations and virtual environments with computing and display platforms to create an ecosystem that allows scientists to focus their time on analysis and discovery.



# Omegalib



- OmegaLib is middleware to ease development of applications for virtual-reality systems
  - Omegalib can tightly couple multiple libraries to create combined or linked visualizations
  - Omegalib utilizes the power of today's graphics capabilities of the web to render complex graphics and then stream to 2D/3D personal devices using a web browser ("cloud computing")
- Currently in early prototype stage, but early adopters welcomed!

# SAGE2™: Scalable Amplified Group Environment

- Middleware to access, display, and share high-resolution digital media on scalable resolution display environments
- SAGE2 is a total rewrite of SAGE using web technologies
- Multi-touch interaction (one or many people)
- Push laptop windows or laptop screens onto a wall



[www.sagecommons.org](http://www.sagecommons.org)

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# CAVE2™ Hybrid Reality System



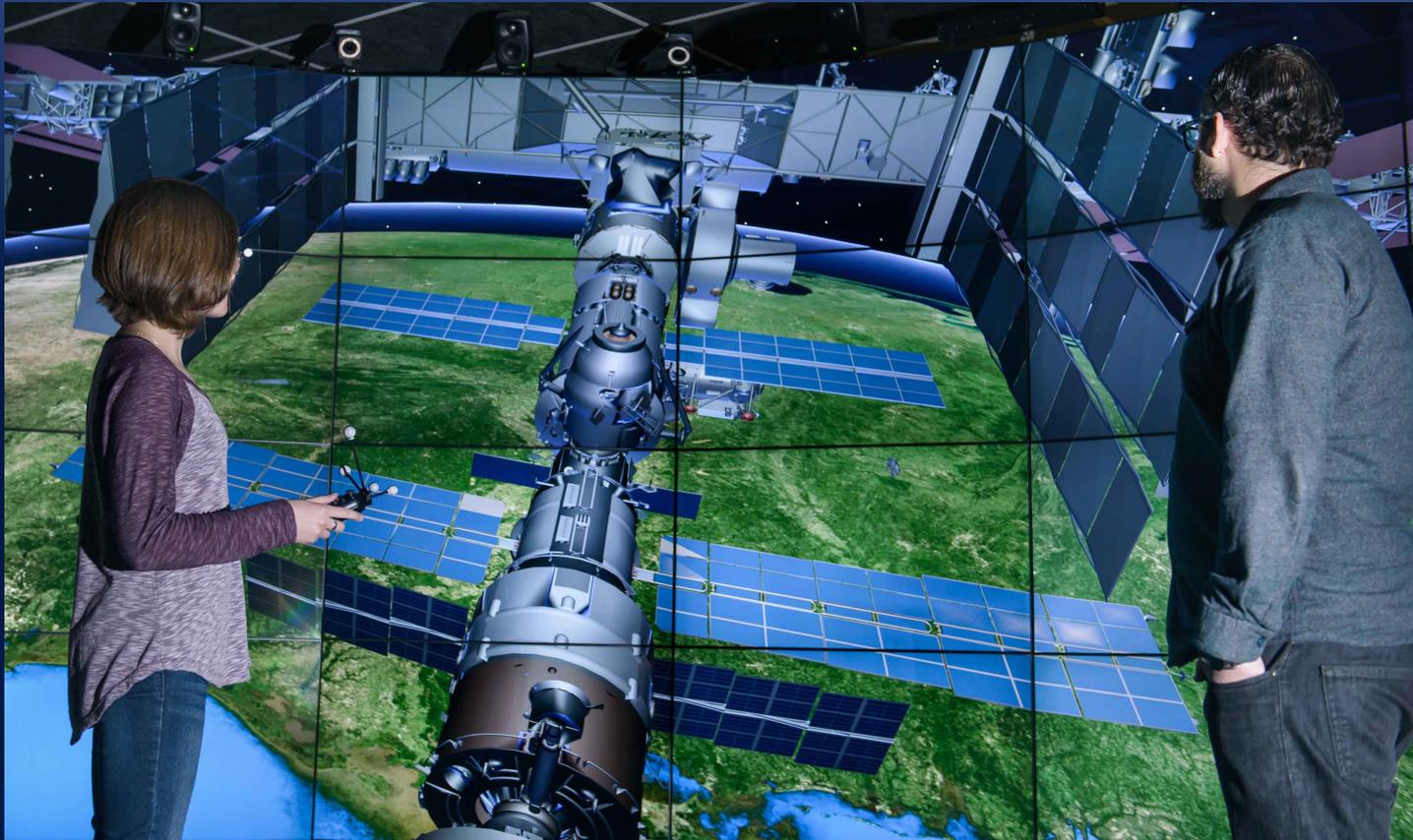
72 passive stereo displays  
36MPixel Resolution per eye  
22 channel audio system  
Cluster-driven (36 nodes)  
Developed by EVL; sold by Mechdyne

[www.evl.uic.edu/cave2](http://www.evl.uic.edu/cave2)



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# Omegalib: Overlaying Data from Multiple Tools

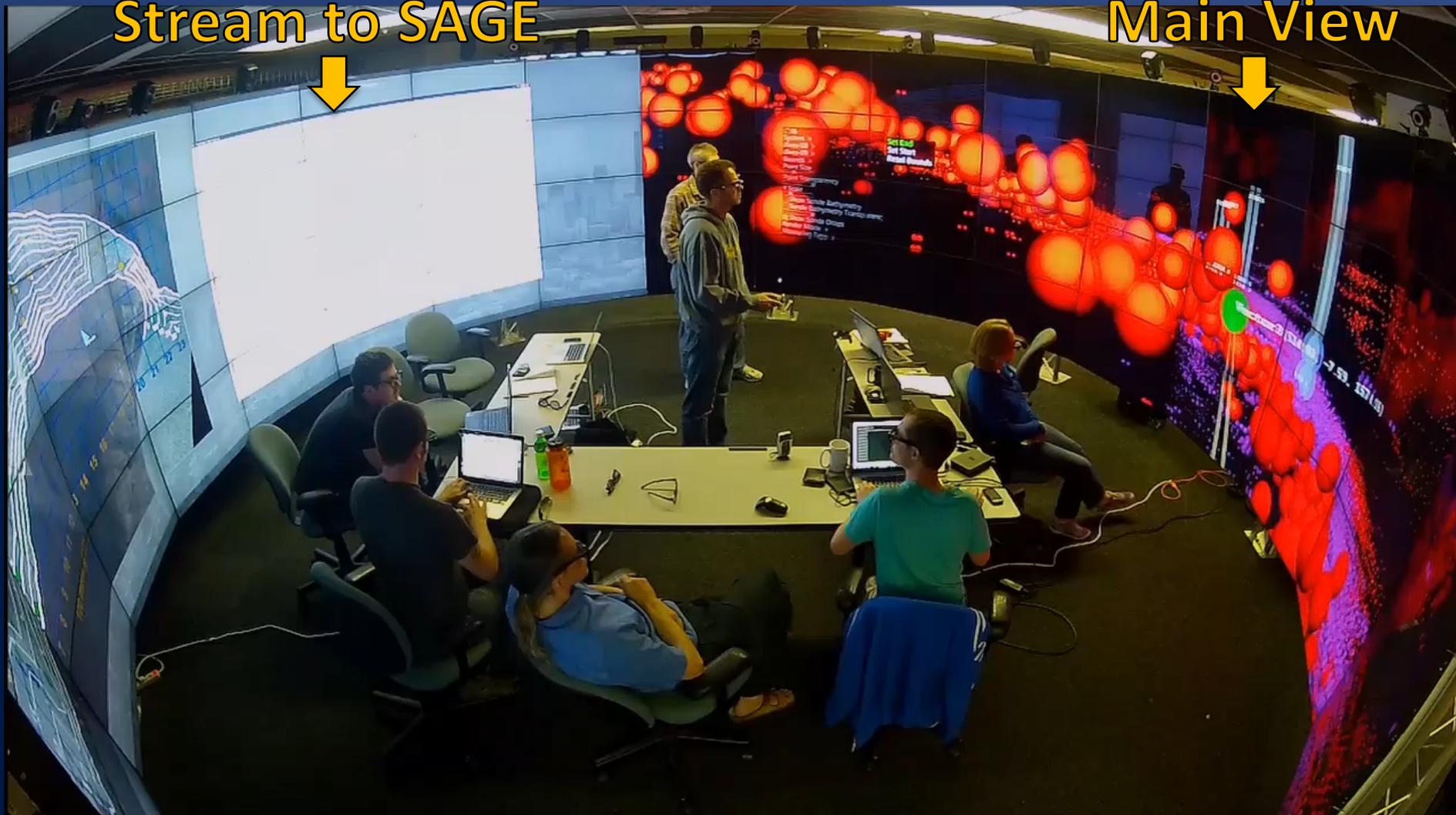


OmegaLib combines a model of the International Space Station (ISS) from Google Sketchup 3D Warehouse, the ISS position data from NASA, and the Earth rendered using osgEarth, shown in CAVE2.

# Omegalib and SAGE2: Display Streaming

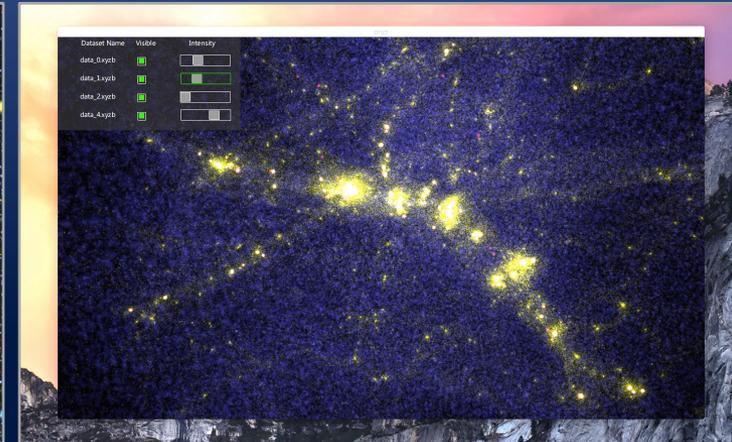
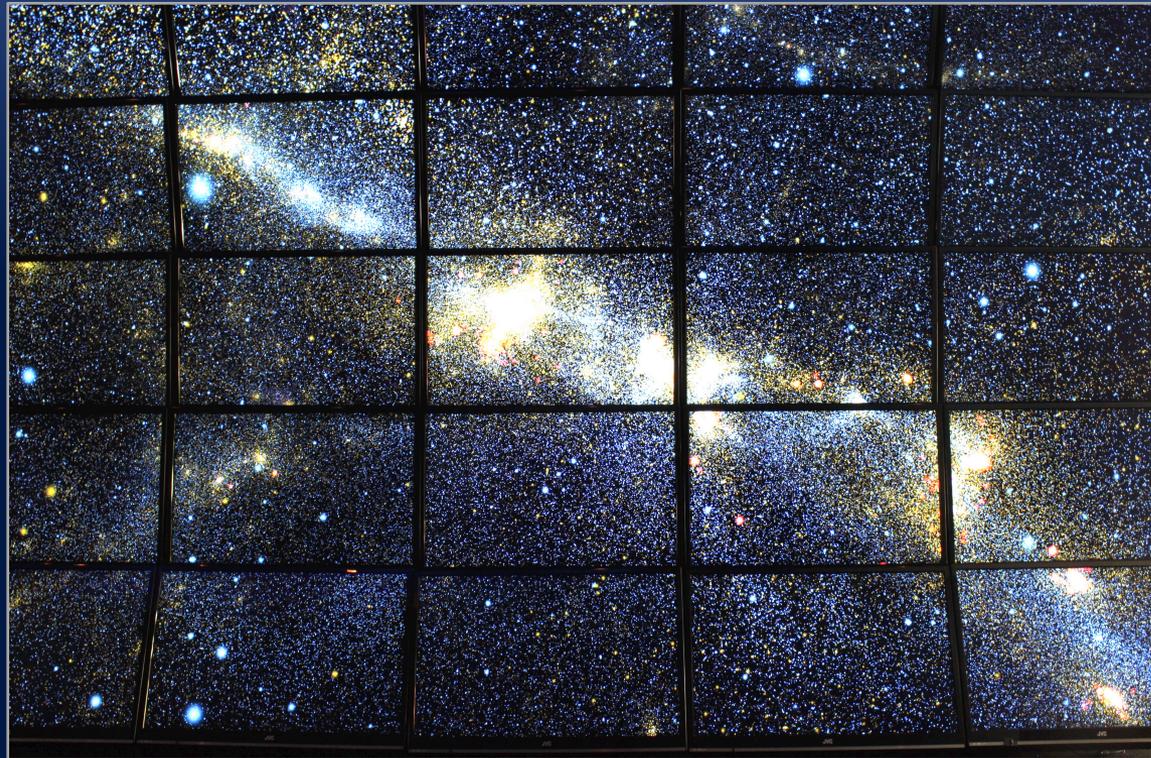
Stream to SAGE

Main View



NASA ENDURANCE project, Peter Doran, UIC  
Electronic Visualization Laboratory, University of Illinois at Chicago

# Omegalib: Multiple 2D/3D Display Platforms



An Omegalib-based galaxy visualization runs on a cluster-driven 3D display wall, a desktop, and streams from a remote machine to a browser on a tablet. Data from the Northwestern University GALFORM group.

# Omegalib: Private Secondary View Streaming

## Main View



Stream To Browser



# Omegalib Availability

- Omegalib available on Github
  - <https://github.com/uic-evl/omegalib/>
- Omegalib Forum
  - <https://groups.google.com/forum/#!forum/Omegalib>



# Thank You!

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[www.youtube.com/evltube](http://www.youtube.com/evltube)

[www.facebook.com/UIC.EVL](http://www.facebook.com/UIC.EVL)

