



Princeton Research Computing Commons Visualization Lab

PRODUCT

Planar DirectLight Ultra Series

LOCATION

Princeton, New Jersey

INDUSTRY

Education

APPLICATION

Data Visualization

PARTNERS

Washington Professional Systems

Transforming Visualization and Data Discovery at Princeton Research Computing

The Princeton Research Computing department provides faculty and researchers across multiple disciplines with a centralized computing infrastructure and expertise for data-intensive analysis and computational modeling. Visualization is a key component of interpreting data, helping researchers generate insights from complex datasets. To support these efforts, the department operates two dedicated visualization labs on campus.

One of them is the Commons Visualization Lab, a new space designed for collaborative data discovery and high-resolution visualization. The centerpiece of the lab is a nearly 40-foot-wide by 9-foot-high (20 x 8) Planar® DirectLight® Ultra™ Series LED video wall with an ultra-fine 0.6mm pixel pitch with a faceted curved design.

Integrated and engineered by Washington Professional Systems (WPS), the floor-to-ceiling display delivers a multifaceted resource for scientific research, instruction and presentations. WPS also added video conferencing capabilities with surround sound audio and three cameras and microphones in the ceiling.

With a resolution of 19,200 x 4,320 pixels, the Planar DirectLight Ultra LED video wall enables researchers to visualize data with far greater detail and clarity. “Visualization allows us to recognize patterns in data more quickly, leading to a better understanding of our data,” said Carolina Roe-Raymond, visualization analyst with Princeton Research Computing.

The video wall’s expansive canvas offers the ability for researchers to view more information simultaneously—especially valuable when working with massive amounts of data. Additionally, the scale of the display introduces an important collaborative dimension to the visualization process.

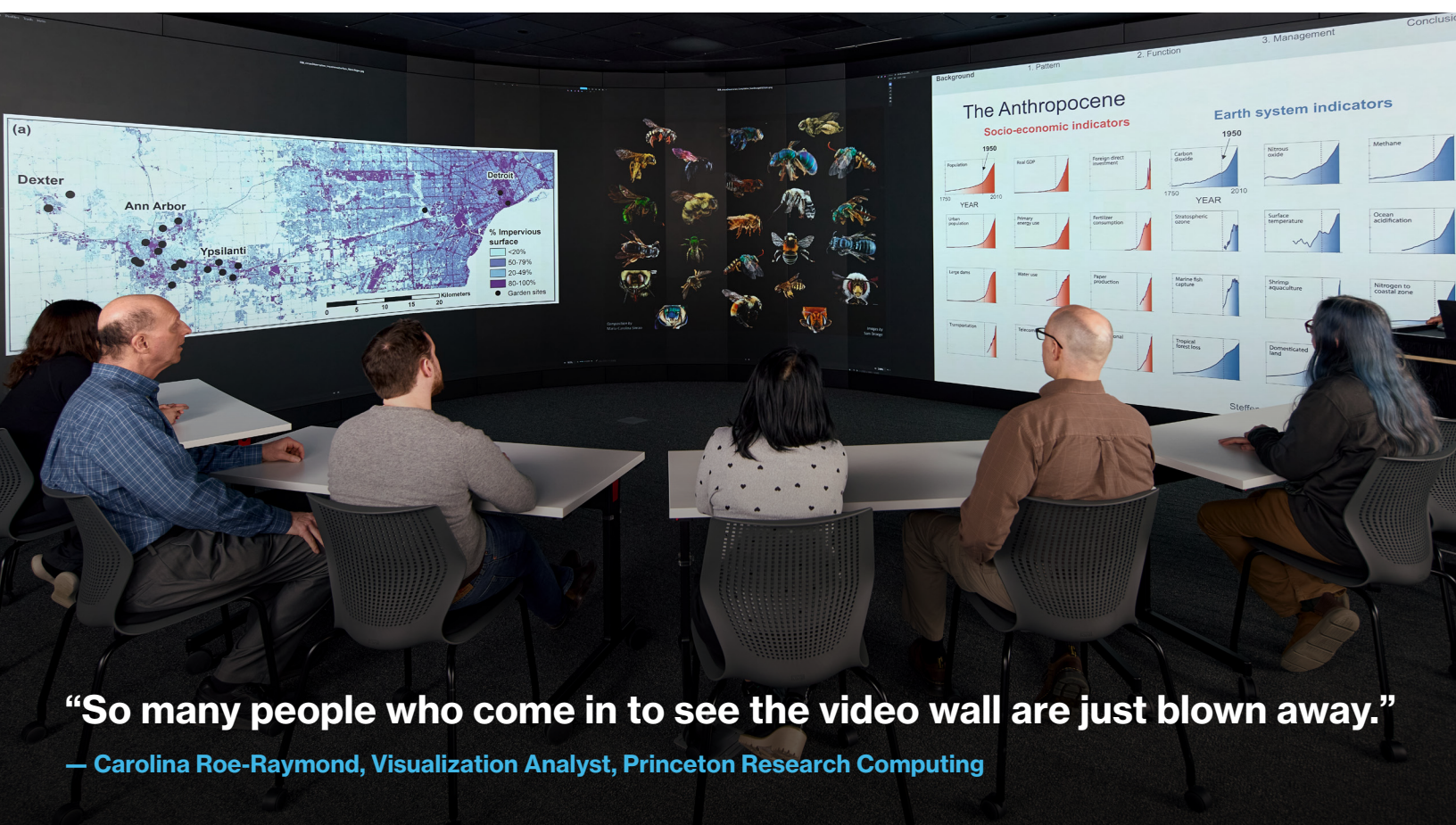
“It really changes how groups can work together,” Roe-Raymond said. “If you have 20 people trying to look at the same data, putting it on a display this large means everyone can see it at once. They can search for patterns together, talk through what they’re seeing and build a shared understanding of the data.”

WPS Senior Project Executive Joe Zamborsky said the LED video wall can be applied in countless ways, enhancing presentations and teaching while supporting a wide range of creative applications. “The uses and possibilities are near endless,” he said. “The image clarity is so good and the resolution so pure that you feel like you could just walk into the wall.”

Cross-Disciplinary Visualization

Eliot Feibush, lead computational scientist at Princeton Research Computing, anticipates the LED video wall attracting strong interest from computational researchers across the university, particularly those working with large-scale simulations.

“A significant need for visualization comes from astrophysics scientists modeling turbulence and other phenomena in the universe,” Feibush said. “Another includes researchers in atmospheric and oceanic sciences who work with very large datasets, such as sea surface temperature and salinity measurements combined with atmospheric vorticity. We can take simulations that produce 83 million pixels and show them one-for-one on the display. The 0.6mm pixel pitch produces about 40 pixels per inch, which is an excellent match for human visual acuity.”



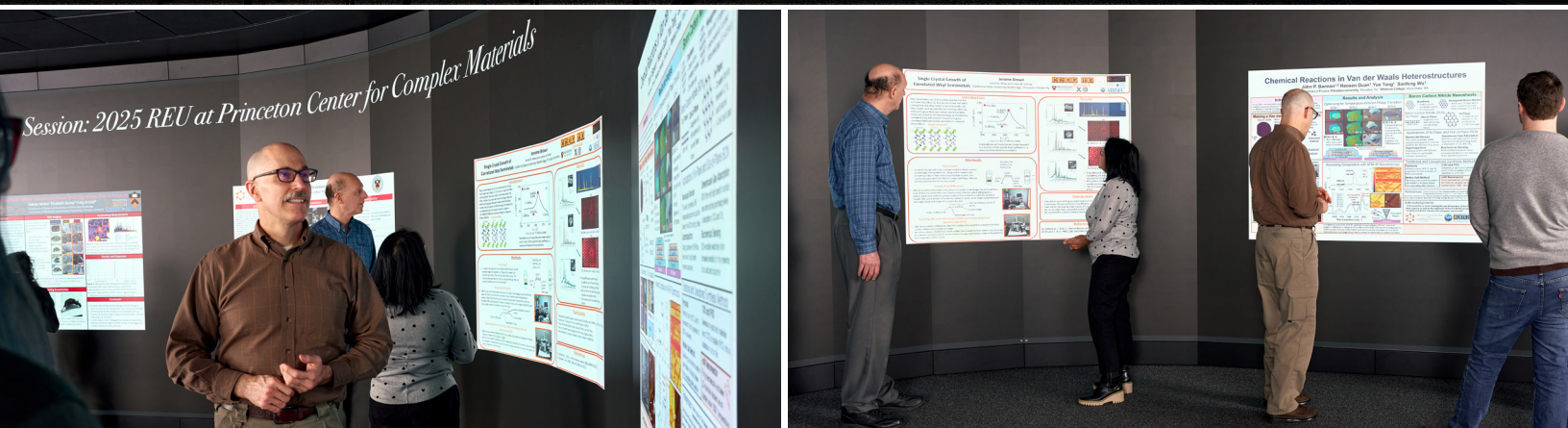
“So many people who come in to see the video wall are just blown away.”

— Carolina Roe-Raymond, Visualization Analyst, Princeton Research Computing



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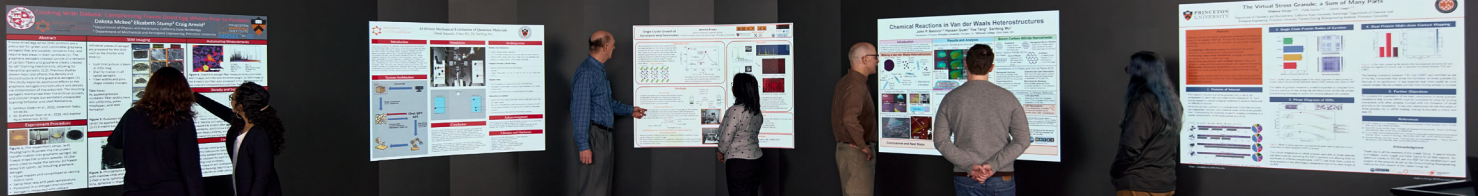


Beyond data-intensive research, Feibush said other departments have expressed interest in using the LED video wall for a variety of applications. “Mechanical engineering researchers designing vehicles or robots could use the video wall to view life-size versions of their designs,” he said. “Faculty engaged in anthropology and historical studies might use it to geolocate their data and visualize the locations of artifacts or the evolution of roadways. We also have strong interest from researchers in geographic information systems—the size and very high resolution of the display allow them to see much more detail across large areas. We are looking into displaying high resolution scans of mural paintings.”

Inspiring Moments of Discovery

While the technical performance of the LED video wall is essential, its ability to engage viewers and create impactful experiences can also play an important role in learning. “So many people who come in to see the video wall are just blown away,” Roe-Raymond said. “There’s something special about that initial ‘wow’ moment. When you experience data or new information in such an impressive way, it can make the learning more memorable and help ideas stick. The LED display really brings that out. And the curved design also adds to that effect—when you’re sitting within the arc of the screen, it creates an immersive feeling.”

Poster Session: 2025 REU at Princeton Center for Complex Materials



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About the Planar DirectLight Ultra Series

Planar DirectLight Ultra Series LED video walls offer always-on, high performance, high resolution display experiences with the finest pixel pitches from 0.6 to 1.2 millimeters for mission-critical and the most refined applications. The series presents several display technology advancements that, in combination, deliver big performance including models with MicroLED, off-board power supply, proprietary Planar ActivAlign self-adjusting alignment technology and the powerful Planar® WallDirector™ Video Controller with its corresponding video wall management software. The advanced MicroLED technology delivers up to three times more brightness compared to standard LED, including more energy efficiency, greater contrast and deeper black levels. The U.S. TAA-compliant displays are entirely covered by the Planar® EverCare™ Lifetime Limited Warranty.