The world’s first 8K digital fulldome system installed as a 1570 film replacement in a dome

The Science Museum of Virginia aims to inspire its patrons and enrich their lives through science. One of the keystones of the popular tourist and educational attraction is its planetarium dome, where guests are immersed in space expeditions, movies and live astronomy presentations on its 76 ft (23 m) screen, the largest screen in Virginia.

Until recently, the facility used 1570 film projectors in the dome, but decided to make the move to digital projectors after being introduced to the clear, crisp, and color rich images digital can provide.

Evans & Sutherland (E&S), a pioneer in computer graphics and digital dome theaters, led the system upgrade on behalf of the museum. They approached the project with a focus on brightness and resolution. “We could offer them an excellent solution at the time for two reasons,” said Dennis Elkins, Director of Engineering, E&S. “One was the availability of the Christie® Mirage 4K25 projector with 25,000 lumens of brightness. It allowed us to give the museum a solution with a brightness level that would equal or surpass that of the 1570 film projector. The second is our proprietary Digistar auto-alignment and auto-blending systems. The combination allowed us to take a multi-projector system and give the museum the image quality they wanted.”

“...the availability of the Christie Mirage 4K25 projector, with 25,000 lumens of brightness, allowed us to give the museum a solution with a brightness level that would equal or surpass that of the 1570 film projector.”

Dennis Elkins,
Director of Engineering, Evans & Sutherland

With their Digistar 5 system, E&S has created a 180 degree display surface on the full hemisphere dome by cross-shooting five Christie Mirage 4K25 DLP® 3D native 4K resolution projectors, with 120Hz high frame rate, or 120 frames per second (FPS) and 3D stereo capabilities.

Customer:
Science Museum of Virginia

Location:
Richmond, Virginia

Industry/Market:
Entertainment

Partners:
Evans & Sutherland

Requirements:
• Long term, reliable performance
• High brightness
• True colors
• 3D Stereoscopic capabilities
• High frame rate

Summary:
Making the move from film to digital projectors, the Science Museum of Virginia upgrades their 1570 giant screen film projection system to the world’s first 8K digital fulldome system installed as a 1570 film projection replacement in a dome, enhancing the content they can offer.

Products:
• Christie Mirage 4K25 DLP 3D projectors (5)

Results:
Leading the upgrade for the museum, Evans & Sutherland use Christie 4K projectors with their Digistar 5 system to create the first digital fulldome system to replace 1570 film projection while meeting the Digital Immersive Giant Screen Specifications (DIGSS) standards, and one of the most technologically advanced digital dome theaters in the world.
They placed three projectors in the back of the dome and cross-shot two of them: the left projector shoots to the front right, and the right projector shoots to the front left. Another two projectors were placed at the front of the dome and cross-shot onto the back. The auto-alignment and auto-blending technology is then used to blend the projections together, creating a crisp, uniform, seamless image for the audience. This easily enables customers to keep their systems looking great long after the installation has been completed.

“The digital fulldome projection works beautifully, and it was the perfect solution for this facility,” said David Sasich, Sales Account Manager, E&S. “The brightness and 3D stereo capabilities offered by the Christie Miage 4K25 made it an ideal option here. With nearly 4 foot lamberts (fL) of brightness, digitized giant screen films and original fulldome content dazzle with color and brilliance. The 8K resolution offers about fifteen times more pixels than HDTV, for image crispness that surpasses 1570 film.”

The digital, 8K picture also eliminates the shake and slight blurriness of 1570 film projectors, and is capable of displaying any standard content frame rate of 24, 30, 48, and 60 FPS, all the way up to a true high frame rate at 120 FPS. The result is a premium experience in terms of resolution and brightness on the dome that can display up to approximately 3.6 billion pixels per second to the audience.

E&S demonstrated the break-through capabilities of the system at the Giant Screen Cinema Association (GSCA) digital dome day in October, 2014. Sasich explained, “We split the dome down the middle with 1570 film on one side and digital on the other. We capped half of each lens so there would be no cross-contamination.” According to Richard C. Conti, Chief Wonder Officer, Science Museum of Virginia, “The results of our conversion exceeded our expectations. The digital system has vastly improved our capabilities and most importantly, is allowing us to better serve our guests.”

GSCA members are not the only ones impressed by the system. The response from audiences has also been remarkable, leading the museum to enhance the content presented in the dome. “I’ve seen all the movies we’ve presented in the dome and it really is a stunning system. It’s a great quality image and the digital projectors with special and unique content that looks out of this world” said Conti. “Our primary presenter is very well versed in astronomy and conducts live and interactive shows where we really get the audience involved and that allows programmatic flexibility that we’ve simply never had before.”

Contact Christie
Contact Christie today to find out how your organization can benefit from Christie solutions.

For the most current specification information, please visit www.christiedigital.com

Copyright 2015 Christie Digital Systems USA, Inc. All rights reserved. All brand names and product names are trademarks, registered trademarks or trademarks of their respective holders. Christie Digital Systems Canada Inc.’s management system is registered to ISO 9001 and ISO 14001.

Performance specifications are typical. Due to constant research, specifications are subject to change without notice.

Printed in Canada on recycled paper. MCU Denver’s CAVEA. Jun 15