

Science Museum of Virginia Planetarium



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

Immersing guests in a digital experience

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."

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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-shoot 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. The museum hadn’t originally planned to offer an astronomical experience in their planetarium, but began exploring it after seeing the potential of the technology. Now, using Christie projection technology and the real-time capabilities of the E&S Digistar 5 system, the museum runs high-energy, innovative presentations that draw on current astronomical events and data, as well as Cosmic Expeditions and Giant Screen Movies.

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



▲ A fish-eye view of the Richmond Theater at the Science Museum of Virginia



▲ Live astronomy presentations

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Corporate offices

Christie Digital Systems USA, Inc.
Cypress
ph: 714 236 8610
Christie Digital Systems Canada Inc.
Kitchener
ph: 519 744 8005

Worldwide offices

Australia
ph: +61 (0) 7 3624 4888
Brazil
ph: +55 (11) 2548 4753
China (Beijing)
ph: +86 10 6561 0240
China (Shanghai)
ph: +86 21 6278 7708
France
ph: +33 (0) 1 41 21 44 04

Germany
ph: +49 2161 664540
India
ph: +91 (080) 6708 9999
Japan (Tokyo)
ph: 81 3 3599 7481
Korea (Seoul)
ph: +82 2 702 1601
Mexico
ph: +52 55-4744-1790

Republic of South Africa
ph: +27 (0) 11 510 0094
Russian Federation
and Eastern Europe
ph: +36 (0) 1 47 48 100
Singapore
ph: +65 6877 8737
Spain
ph: +34 91 633 9990
United Arab Emirates
ph: +971 4 3206688

United Kingdom
ph: +44 (0) 118 977 8000
United States (Arizona)
ph: 602 943 5700
United States (New York)
ph: 646 779 2014

Independent sales consultant offices

Italy
ph: +39 (0) 2 9902 1161



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Richmond, Ontario

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