

Ars Electronica Center Linz opens a new attraction:

Deep Space 8K – The Next Generation

(Linz, August 12, 2015) Breathtaking images that take high-resolution, brilliance and contrast to the limits of technical feasibility are in store for visitors to the new Deep Space 8K at Ars Electronica Center Linz. Dual 16-by-9-meter projection surfaces on the completely revamped space's wall and floor now display incredible visuals, videos and 3-D applications in ultra-high-definition 8K. They're made possible by eight state-of-the-art Christie Boxer 4k30 Mirage projectors, two high-performance XI-MACHINES processors each equipped with four NVIDIA Quadro M6000 graphic cards, and software custom-developed by the Ars Electronica Futurelab. While this leading-edge hardware & software package was taking shape, Futurelab staffers were also busy developing totally new modes of interaction and means of conveying content that immerse visitors into worlds of imagery in ways that take full advantage of the quality and intensity this extraordinary infrastructure makes possible.

From The Cave (1996) to Deep Space (2009) to Deep Space 8K (2015)

Virtual reality has been a mainstay of the Ars Electronica Center's attractions ever since it opened in 1996. The 3-by-3-by-3-meter confines of The Cave were Ars Electronica's first presentation space in which the general public could experience three-dimensional content including, above all, artistic applications. In 2002, the Ars Electronica Futurelab made headlines worldwide by unveiling the world's first CAVE powered by a PC. In conjunction with the expansion of the Ars Electronica Center in 2009, The Cave was replaced by a completely new setup developed by the Ars Electronica Futurelab. Deep Space featured two 16-by-9-meter projection spaces on the wall and floor displaying images in 4K resolution. Now Deep Space 8K takes viewing to the next level and establishes a new standard for technical excellence.

Deep Space 8K – The Ars Electronica Futurelab's Latest Blockbuster

The projectors previously used in Deep Space could deliver images in Full HD, which means 1,920 by 1,080 pixels. Deep Space 8K quadruples this output. It's made possible by eight Christie Boxer 4k30 Mirage projectors, a model that just came onto the market and is now making its European debut in Linz. Each one projects 4,096-by-2,160-pixel images at a rate of 120 times per second. Four provide the images for the wall, and four are for the floor. The respective images are made up of 8,192 by 4,320 pixels and thus achieve a resolution of 8K. And this crystal-clear resolution isn't all! These Christie Boxer 4k30 Mirage projectors reach a completely new dimension of brightness: 30,000 ANSI lumens as compared to the 12,000 attained by Deep Space's previous equipment.

The next technical revolution was sparked by the gargantuan amount of data that now has to be processed in Deep Space—over 23 gigabytes per second, and thus more than the contents of a Blu-ray disc. For certain applications, this job is done in real time. Since this

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output is far beyond the processing capacity of Deep Space's previous equipment, the technical crew installed two high-performance processors from XI-MACHINES that deliver the processing equivalent of 400 computers typically used for office tasks. Both are equipped with four NVIDIA Quadro M6000 graphic cards. About 1,000 meters of fiberoptic cable feeds their output to the projectors.

Over several months, the Ars Electronica Futurelab's crew, applying the expertise in the field of virtual reality they've built up over the years, succeeded in optimally coordinating the interplay of all these high-tech components. Plus, the engineers developed a completely new content management system for Deep Space and equipped it with an interesting array of interaction options & control features—for instance, LeapMotion, a laser tracking system, interfaces for pulse and breathing rate, an Ipad, an Android interface and a touchscreen.

The World's First Time-lapse videos, 3-D Imagery and Gigapixel Graphics in 8K

The Ars Electronica Futurelab's crew thus established a new technical benchmark in Deep Space 8K, and this posed a real challenge for those programming the content to be screened in the new venue. The reason is simply that, at present, there aren't all that many films, videos and 3-D applications made for 8K resolution. Accordingly, the Ars Electronica Futurelab crew embarked on a worldwide search for suitable material and also got busy creating content independently. For the most part, all the programming screened in the new Deep Space consists of the first gigapixel images, time-lapse videos, animated films and 3-D applications that have been developed in and for 8K and can really be viewed at this level of resolution.

The Universe Within – Deep Space 8K as a Virtual Anatomy Theater

Organs, muscles, bones, the cardiovascular system and the human body's network of nerves—in cooperation with internationally renowned facilities such as the Fraunhofer Institute for Medical Image Computing (MEVIS), the Ars Electronica Futurelab developed an extraordinary three-dimensional model of the human body. Visitors can travel along a variety of narrative pathways on their intellectually enriching and visually impressive journey through the universe within.

Cultural Heritage: Artistic Treasures of Human History in Deep Space 8K

All over the world, humankind's greatest cultural treasures are being preserved in digital form by the use of 3-D laser scanning. These procedures result in point clouds that engender impressive three-dimensional models which, in turn, provide completely new insights for scholars and interested laypeople alike. Now, a point cloud renderer/viewer specially developed by the Ars Electronica Futurelab enables audiences to behold the amazing images produced by these point clouds in 8K resolution. One particular highlight is "Rome's Invisible City in 3D: A BBC Film" created by the British Broadcasting Company in cooperation with ScanLab Projects. It brings to life streets, buildings and squares centuries after the Roman Empire's decline and fall. A three-dimensional point cloud envisions ancient Rome,

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Antiquity's great urban center that, over the course of centuries, has been built over and exists today several meters below the city's surface.

Playspaces – Deep Space 8K as a Setting for Interactive Experiences

Thanks to numerous interactive options that can be activated at the push of a button, Deep Space can instantaneously morph into a one-of-a-kind playground and gaming space for players of all ages. Pharus, a laser-tracking system developed by the Ars Electronica Futurelab and experts at the Upper Austrian University of Applied Sciences' Hagenberg campus, makes it possible for up to 30 individuals to take part in interactive programs and games, and thus constitutes the ideal setting for Game Changer Suite, a collection of multiplayer games developed by Hagenberg students. All players are registered via laser tracking and can thus use body language to control their virtual avatars appearing on the space's wall and floor.

Time-lapse, Panoramas, Gigapixels: New Perspectives of the World in Deep Space 8K

Time-lapse photography exerts a fascination all its own—it enables us to witness processes we'd be unable to perceive without high-tech assistance. Here, in combination with the extraordinarily high resolution and jumbo physical dimensions of the images screened in Deep Space, time-lapse footage—just like panorama shots and gigapixel visuals—can achieve all the visual power it's capable of. One example that's as impressive as it is touching is Lukas Hüller's photography. The gigapixel shots taken by this Viennese artist show everyday life in Zaatari, a refugee camp in Northern Jordan. With a population of approximately 80,000, Zaatari is one of the world's largest refugee camps.

Media Art in Deep Space 8K

Top-of-the-line infrastructure like the new laser tracking system and large-format display surfaces on the wall and floor make Deep Space 8K an exciting challenge for media artists. Visitors' individual positions and their interactions with one another demand sophisticated concepts. Plus, Deep Space 8K is the perfect venue in which to screen animated films singled out for honors by the Prix Ars Electronica.

The Action Pack: Pure Adrenalin in Deep Space 8K

Ars Electronica has enjoyed a long and happy working relationship with Red Bull Media House, the world's foremost source of action-packed sports videos and mind-blowing film footage. A video documenting the spectacular feats of British freerunner Ryan Doyle is Red Bull's contribution to the new Deep Space's lineup.

Deep Space 8K: <http://www.aec.at/center/en/ausstellungen/deep-space/>

Photo spreads, interviews and background info: <http://www.aec.at/aeblog/en/category/center/deep-space/>

Ars Electronica Center: <http://www.aec.at/center/en/>

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