

New projector systems in planetariums invite the audience to take part in virtual adventures in the dark depths of the cosmos.

Hurling boulders of ice and stone compel the pilot of the spaceship to make evasive maneuvers, during which the passengers are jolted back and forth in their seats.

# **Riding** the Comet

Deafening alarm sirens warn of impending collisions, and finally the nucleus of the comet fills the entire field of view of the panorama dome which arches over the viewers' heads. The engines roar for a last time, and billows of smoke blur visibility. This is followed by a truly icy silence. With 200 passengers on board, starship Walther Bauersfeld has landed on the icy nucleus of the Shoemaker Levy 9 comet.



# Virtual Space Flights into the Depths of the Cos



During the next few minutes, the armchair space travelers will “age” by more than 50 years. In quick motion, they are propelled on the comet through the solar system until, when flying past the huge planet of Jupiter, they are catapulted onto a new orbit. After a few loops around Jupiter the flying iceberg is ultimately torn apart by the planet’s tidal forces and, in the end, the debris plunges into the storm-lashed atmosphere of the huge celestial body. Literally in the last minute, the space travelers can save their skins and embark on a new space adventure ...

**The future has already begun.** With the exception of the billows of smoke and the jogging effects which can currently only be imitated by space simulators in leisure parks, such a show could already be presented in today’s planetariums from Carl Zeiss. Originally, a planetarium was only intended as an instrument that could reproduce the celestial motions in the Earth’s sky. At least this was what Oskar von Miller, the founder of the Deutsches Museum in Munich, “ordered” from Carl Zeiss. Professor Walther Bauersfeld, head engineer at

Carl Zeiss at that time, surprised his client with the pioneering concept of a projection planetarium. With this ingenious idea, he banished earlier attempts to visualize the heavens and planetary motion into the museum for all time and simultaneously created a self-contained “star theater.”

Since then, the opto-mechanical apparatus equipped with many lenses and gears has been enhanced into a complex, highly modern projection system that leaves (practically) nothing to be desired. This can be witnessed not only by visitors to the Olympics in Peking (where the new planetarium was opened on Xi Zhi Men Wai Street in 2004), but also by vacationers to the Austrian town of Judenburg. From 2008, the new technology from Carl Zeiss can also be experienced at various locations in the USA: Peoria in Illinois, Fort Worth in Texas and in Kingsport, Tennessee. In the Japanese city of Nagoya, the *UNIVERSARIUM* planetarium projector is being installed in the world’s largest planetarium dome with a diameter of 35 meters as part of a new science center. The new building is due for completion in 2011.

**Glass fiber stars – as radiant as the real sky.** The glass fiber projection now used for all projector sizes guarantees a realistic star-lit sky, the like of which is difficult to find in today’s light-polluted centers of civilization. Thanks to modern electronic control, the planet projectors are no longer brought into (approximately) the right position in a time-consuming procedure using slowly moving gear mechanisms, but are activated digi-

mos



*Longing for a night sky: Planetariums are becoming increasingly popular.*

tally by step motors. This allows any desired journeys through time and space within a single program – even a ride on the nucleus of a comet or a trip to one of the many moons in the solar system.

These new possibilities of sky and planet projection are supported either by the *powerdome®ADLIP HD* laser-supported, all-dome projection system (All Dome Laser Image Projection High Definition) or by the *powerdome®SPACEGATE* system also developed by Carl Zeiss. Their two or five digital projectors – needless to say, featuring high quality ZEISS *DIGIGON* lenses – illuminate the entire dome surface (360° x 180°) evenly and practically without any discernible transitions. Alternatively, two

or four projectors containing SXR technology (Silicon Xrystal Reflective Display) can be used. They combine SONY's wealth of experience in the field of digital movie projector technology with the ZEISS *DIGIGON* wide-angle lenses specially developed for dome projection.

**Complex electronics allow simple operation.** Powerful software is required for the precise simultaneous control of the planetarium projector and all-dome projection in pre-produced programs and for live shows in particular. Carl Zeiss offers the *powerdome®* system for this purpose. Behind this name is a comprehensive control platform that combines the opto-mechanical systems with the digital projectors and simultaneously

manages all image and sound data. *Powerdome®* was developed in collaboration with the Fraunhofer Institute for Computer Architecture and Software Technology in Berlin and permits intuitive operation, regardless of whether the traditional control panel or a keyboard and mouse are used. This allows practically limitless navigation in the universe, the seamless transition from a terrestrial view of the sky to virtual spaceflights into the depths of the cosmos.

**The development continues.** The former planetarium originally developed for the newly founded Deutsches Museum in Munich has therefore become a "Universarium" in the true sense of the word. And Carl Zeiss is still constantly devising new ideas for improving and expanding its spectrum of applications. Wilfried Lang, Manager of the Planetariums business unit: "All-dome or full-dome projection is still in its infancy. Carl Zeiss concentrates on projection solutions which promise high image quality. The applications will continue to far exceed current planetarium presentations. These include, for example, possible uses in the entertainment and health fields."

*Hermann-Michael Hahn*