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Modern visualization techniques in full-dome Planetaria

Where art, technology and science meet together

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Abstract

Modern Planetaria have, besides of the classical projection techniques, a set of digital projection instruments which are able to go far beyond the traditional approach of displaying star constellations. The techniques are capable of projecting the full scale of sky objects in our known universe. They can take advantage of the unique full-dome design of a planetarium combined with 3D immersive cinema technologies, multi-channel video streams, online and interactive video-material. The complete hardware environment of a modern planetarium is able to be operated with a huge set of commercial software including Digital Sky 2 from Sky-Skan, which is compatible with the most advanced database of sky-objects maintained by the American Museum of natural history. This software combined with the given hardware is also able to display the starry sky with stereo 3D images. The providers of these solutions kept in mind, that it will be an advantage to give the possibility of making own productions with selfmade material composed of own scientific results or combine the scientific material with art elements like music or fictive image interpretations of alien world for example.

Also the combination of modern technologies and the anatomy of a full-dome theatre make it possible to go further into complex installations to make scientific results transparent in a very sophisticating way. With the given technologies and a proper joint development of artists, scientists and engineers, it will be possible to fascinate people about e.g. the "sounds of the universe", the interaction of solar wind with solar systems objects and their resulting sound waves. One will be able to have a virtual flight through the solar system in 3D while walking through the auditorium of the Planetarium with the help of advanced motion tracking algorithms. Any audiovisual space exploration content can be displayed with one of the most advanced technologies available in digital projection to give a pure and realistic feel about space physics.

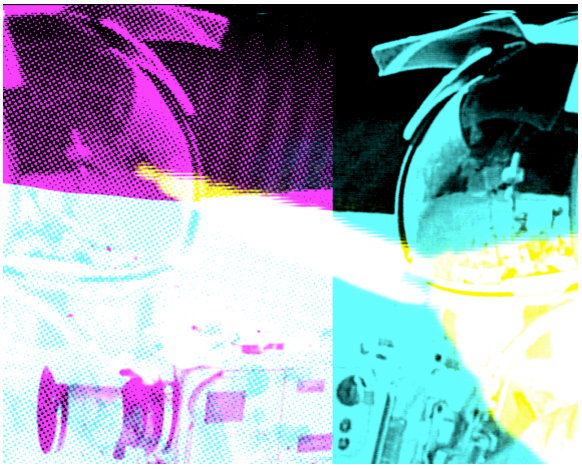

Figure 1: Artistic impression of the space exploration age (Screenshot taken from moving images, F. Topf 2010)

The Aim of this presentation will be to show the achievements of scientists and artists in Graz regarding the synthesis of modern arts and science and to stimulate discussions on how both science and art may be used for public education and entertainment. The recently started Initiative Project of the Planetarium Graz is considered as a test platform for implementation of the developed artistic and scientific visualization concepts.

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