EPSC Abstracts
Vol. 6, EPSC-DPS2011-324-4, 2011
EPSC-DPS Joint Meeting 2011

Multiversum Graz: A planetarium project

R. Stöckler (1), M. Khodachenko (1), F. Topf (1), M. Reiss (2), H. Sünkel (2), A. Hanslmeier (3), W. Stumptner (4), G. Holler (2), G. Rath (3)
(1) Space Research Institute, Austrian Academy of Sciences, Graz, A-8042, Austria (robert.stoeckler@oeaw.ac.at), (2) Graz University of Technology, A-8010 Graz, Austria, (3) Institute for Physics, Karl-Franzens University, A-8010 Graz, Austria, (4) Österreichisches Weltraum Forum, A-8045 Graz, Austria

Abstract

The core-team of the Multiversum Graz project is promoting the planning, concept, creation and maintenance of a state-of-the-art planetarium residing in Graz since the beginning of 2009. This contribution is aimed at fostering synergies within the European planetaria community and groups concerned with related projects such as building planetaria, public outreach and communication, involving pupils and students in scientific projects and making science more popular in general. This presentation emphasizes the concepts of a modern technology planetarium and the environmental, educational and cultural benefits to its region.

1. Introduction

Change of the technology also changes the potential for new and imaginative planetarium programs. Nowadays, classical astronomy is only one of the many subjects covered. But it remains essential: It provides the fundamentals for the planetaria's educational and entertainment activities. At the same time, along with the astronomical shows, it is now possible to present programs on nearly any topic from the inside of atoms, to the Dinosaurian world and the pyramids of Egypt. Today, planetarium shows take the audience to the very limits of the universe and into the interior of the stars. They explore the question of life on the Earth and in outer space and recount the heroic legends from classic antiquity. With laser shows, concerts and theatre performances, the events in planetaria have came a long way from the original sense of the term planetarium. In these new circumstances modern, planetaria may be equally referred to as "star theatres", "cyber domes" and "multimedia facilities".

2. Motivation

Through innovative educational technologies, the Multiversum Graz is going to enrich public with better understanding of the world around us and equip the next generation of explorers and scientists with the skills and desire to learn more about our Universe. We share the gained experiences on running the Multiversum Graz project and try to motivate other groups and individuals to contribute to educational and cultural infrastructures of their region hence educating the public and introducing science to a broader audience.

3. Basic approach

The specific feature of the Multiversum Graz project consists of the fact that the initiative to build this facility comes from a group of professional space physicists, astronomers and engineers, which are also prepared to provide day-to-day support and the management of the planetarium during its operation. It will make a step forward and beyond the traditional planetarium concept. It will be organized to bring together and keep interrelated to each other three key functional elements: 1) Education, 2) Research, and 3) Entertainment. The primary goal of the project team is to use for creation and operation of the Multiversum Graz and all its subdivisions as much as possible the available local a) intellectual potential, b) RTD infrastructure and c) human resources. This in particular concerns the tasks of making the planetarium architect project, house erection, equipping of the planetarium with professional demonstration techniques, providing of competent lecturing staff and preparing of activity programs and shows.

3.1 Education

The Multiversum Graz will be a facility focused on all facets of science education. It will be not only a place for children, but also for adults and educators. Using the planetarium interactive learning kits, younger visitors will have an opportunity to act-out astronomy stories, do science experiments or find constellations in a sky show. Interested adults and students will take part in the education teams and public events as docents and volunteers. The spectrum of educational offerings in the Multiversum Graz will extend from interactive demonstrations up to students graduate level coursework and teachers assistance and professional development programs. The Multiversum Graz will serve as an additional tool to help pupils and students understand the elements of physics and astronomy and encourage and excite students in the areas of science and mathematics. All these activities will be realized on the basis of a specially created Interactive Science and Technology Centre (ISTC) in the planetarium.

The ISTC will be equipped with a set of computer based interactive installations which will include a) computational models of astrophysical phenomena, b) interactive knowledge-testing tools, c) on-line educational materials provided at ESA and NASA multimedia and public outreach portals, d) real-time visualization of actual astronomical data (space-weather monitors, robotic telescopes, etc.).

3.2 Research

Special attention is paid to sharing of research RTD and lecturing tasks by the scientific staff, which is a common practice in the world-leading planetaria. Engagement into the scientific research work keeps the personnel on the frontiers of modern science and supports their up-to-date knowledge about recent achievements in space explorations. The Multiversum Graz will create a research centre, where the members of the planetarium staff, along with performing their major duties in operation and support of the facility as well as lecturing, will carry out scientific research work, so the research activity at the Multiversum Graz will be closely linked to its educational mission. It is planned in particular that research projects carried out in the planetarium will engage university students and postdocs, as well as gymnasium and school pupils.

3.3 Entertainment

Entertainment becomes nowadays an inherent element of the modern planetarium activities. This is due to the fact that full-dome digital visualization, acoustic and laser projection technologies are applicable universally and have a strong impression effect on the audience. They are now widely used in the fast developing, new branch of film art, immersive cinema, as well as in other areas of modern art. Projection of high-definition video streams on a giant spherical dome screen immerses audiences into the virtual reality worlds, which could be other planets, deep space, prehistoric jungles, ocean, or insides of the micro-universe. The virtual reality effect of full-dome projection is enhanced by the digital 3D and stereo visualisation features. Additionally to that, planetarium laser projection techniques are of wide capability for creation of various light effects, laser graphs, coloured visual phenomena and animations.

The possible Entertainment activities of the Multiversum Graz will also incorporate a Space Café and a Souvenir shop. Additionally to that, the planetarium facility could be made available part-time on a rental basis to clubs or public organizations.

4 Collaborating organizations

In course of the project development the Multiversum Graz team has established working contacts to several Austrian/Styrian and international organizations and communities, which provide their support to the project and intend to collaborate with the Planetarium and its subdivisions in future. Among those are: (1) the European Research Infrastructure EUROPLANET-RI, (2) Styrian Astronomer Union and Johannes Kepler Observatory, (3) Regional union of physics education institutes Physik.Daktik-Graz, (4) Austrian Space Forum, (5) Styrian public education centre.

Acknowledgements

The authors are thankful to Europlanet-RI and its subdivision JRA3/EMDAF for support of the Graz Planetarium initiative.