A Journey Through the Universe at the Deutsches Museum

Best Practices

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Key Words

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Summary

Five research institutions in Munich and Garching bei München joined forces in the International Year of Astronomy 2009 to realise a unique exhibition project at the Deutsches Museum. The exhibition is called Evolution of the Universe and invites visitors to take a tour through time, beginning 13.7 billion years ago with the Big Bang and finishing with a glimpse into the future of the Universe. En route visitors learn how space, time, matter and the large structures in space have formed. The exhibition combines findings from astronomy, astrophysics, nuclear and particle physics in order to present the history of cosmos from different perspectives.

Introduction

In the orchestra of the natural sciences, astronomy plays the part of the first violin; it is a fascinating and diverse science, which impacts on neighbouring disciplines, like physics, mathematics, chemistry, engineering, and in the future, possibly biology too. In ancient times, observing and studying the sky was the only way to find one's bearings, and when mankind started to settle, the celestial constellations led our ancestors through the seasons of the year, telling them when to plant and harvest. Astronomy also touches on deep philosophical questions, such as: where do we come from?

Recognising the importance of astronomy, nearly 150 countries took part in dedicated projects and events that took place throughout the International Year of Astronomy (IYA2009). Here I will describe the planning and execution of one such IYA2009 project — an exhibition at a science museum in Munich, Germany.

The Deutsches Museum in Munich, Germany, is one of the biggest and most visited science and technology museums in the world. It was founded in 1925 and became world famous in the post-war era. Today it attracts close to 1.5 million

visitors per year, with the museum being a "must" for both school classes and visiting tourists.

The permanent astronomy exhibition at the Deutsches Museum is extensive and stretches over 1100 square metres. It focuses on classical astronomy and astrophysics, displaying a large number of instruments, both old and modern, and supplemented with demonstrations and small experiments. However, apart from small cosmetic touch-ups, the exhibition was last restored in 1992, and thus does not include the important findings of the past two decades. Also, the museum had reached a point where it needed to modernise its presentations to meet the expectations of today's more technically and visually demanding audience.

This is where the IYA2009 exhibition, Evolution of the Universe, stepped in to help — to fill this knowledge gap with a modern exhibition that covers recent discoveries in cosmology and astrophysics. Five research institutions co-produced the exhibition: the European Southern Observatory (ESO), the Max-Planck Institutes for Physics, Astrophysics and Extraterrestrial Physics and the Excellence Cluster Universe. The project planning began early in 2009 and the exhibition was opened to the public on 9 December 2009 and will remain open for at least two years.

From planning to execution

The five institutions behind the exhibition agreed to be equal partners with regards to financing and most of the project management, but with the Excellence Cluster taking the project lead. The main aim of the exhibition was to interest and educate the general public, taking them on a journey through the 13.7 billion years of the Universe's history, and the methods and tools astronomers use to investigate its different stages of evolution. As all the institutions involved have a strong commitment to education and public outreach, the exhibition offered a fantastic opportunity for them to continue this important work.

Since the exhibition room was small (about 100 square metres), it was important to limit the number of topics covered. The 13.7 billion years of the history of the Universe was subdivided into five major epochs or stages: Big Bang, The Early Universe, Structure Formation, The Local Universe (The Universe on Your Doorstep) and The Future of the Universe. Staying with the usual format at the Deutsches Museum, the timeline was complemented with a hands-on demonstration area, plus a movie on the ceiling.

After the institutes had approved the finance plan for the exhibition, the start of the project was marked with a kick-off meeting in February 2009. At this meeting the partners set the milestones and decided on the structure of the team. The opening of the exhibition was scheduled for the autumn of 2009, but this was quickly postponed to a more realistic date of December 2009. The project team consisted of only five scientists (Werner Collmar, Olivier Hainaut, Hans-Thomas Janka, Georg Raffelt and Jochen Weller), who were each responsible for the material for a specific epoch in the timeline, four consulting scientists (Andreas Müller, Herbert Scheingraber, Achim Weiss and Florian Zaussinger), three public outreach experts (Ed Janssen, Barbara Wankerl and Silke Zollinger) and a science journalist. A professional team of interior architects — a company called Die Werft, which specialises in designing and building exhibitions — was also brought on board the project.

As mentioned earlier, due to the size constraints of the room, the exhibition could only focus on a few crucial stages in the Universe's history. But after the first round of collecting ideas, we had far too many proposals for themes, exhibits and movies. Also, not all of the artwork and film material were of sufficient quality. It took the team two workshops in April and May, in collaboration with the architectural partner Die Werft, to sift through the collected material to find the best resources for the exhibition. With five large institutions involved, this was a slow process, involving long discussions before decisions could be reached on the proposals. Fortunately, the hard work paid off: the first exhibition layout presentation by Die Werft in May 2009 was accepted unanimously.

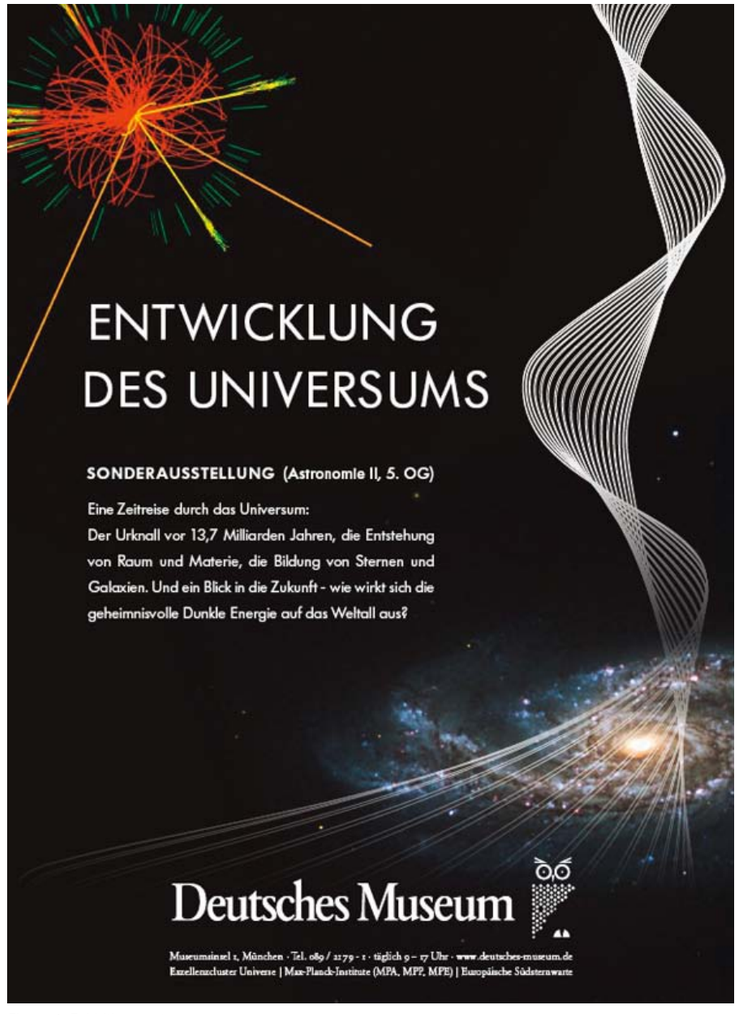

Figure 1. Exhbition poster.

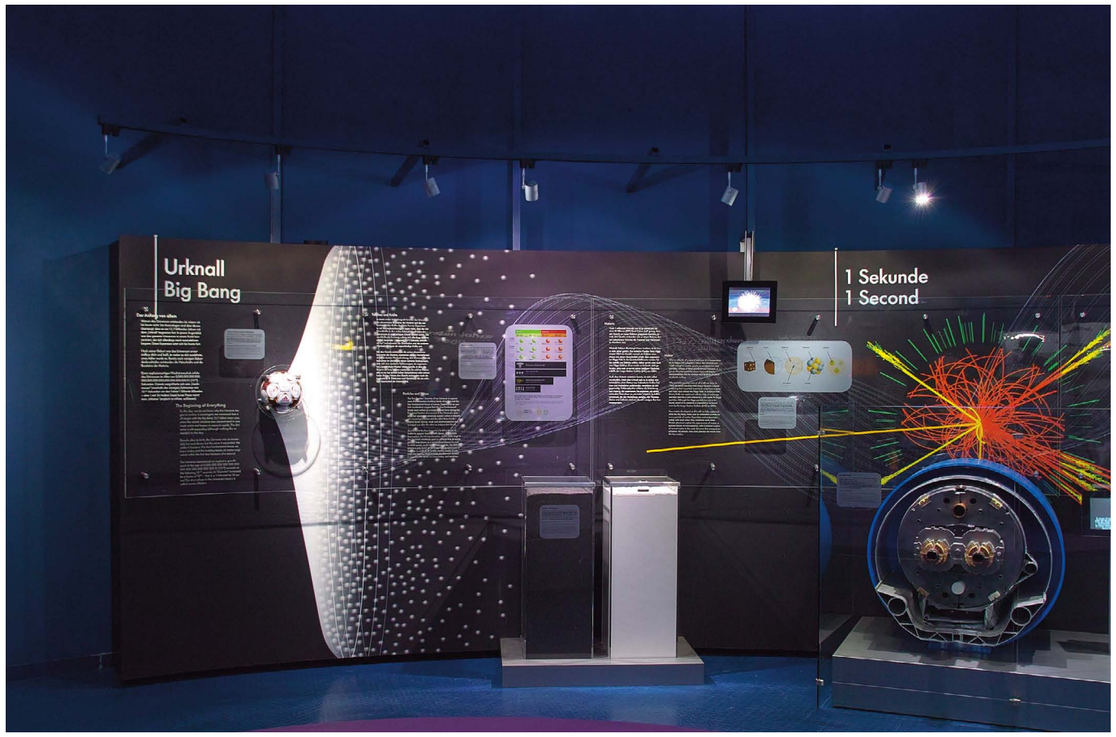

Figure 3. View of the exhibition. Credit: KB Media/Die Werft

Amazing Universe

On entering the exhibition room, visitors can choose whether to walk along the history of the Universe wall, or to sit or lie on the central circular sofa and watch the movie on the ceiling. The exhibition presents a unique combination of exhibits and demonstrations. For example, a football is used to explain how the Universe quickly inflated from an unimaginably small "dot" to the size of ball, while two boxes of differently coloured sand are used to represent matter and antimatter. A demonstration about the cosmic microwave background (CMB) shows how the CMB would look with different ratios of dark energy, ordinary and dark matter. A very simple and effective presentation was achieved in the Future section: three different-sized mirrored boxes with LEDs (each light representing a galaxy) give a stunning impression of how dark energy is influencing the Universe.

The exhibition also benefits from excellent contributions from the Deutsches Museum, such as a life-size model of the inner tube of the Large Hadron Collider and the Differential Radio-wave Micrometer used in the COBE mission. ESO contributed a new model of the European Extremely Large Telescope, and the Max-Planck Institute for Extraterrestrial Physics provided a beautiful model of a black hole at the centre of the Milky Way.

Conclusions and future plans

The exhibition has been immensely successful, with very positive feedback from both the visitors and the Deutsches Museum management team. At the opening of the exhibition on 8 December 2009, Professor Wolfgang Heckl, director of the Deutsches Museum, said that this "extraordinary exhibition" should hopefully become a permanent part of his institution.

Although it is impossible to count the number of visitors who come to see this exhibition, but if only one percent of all visitors visit the exhibition, that would mean 30 000 visitors over a two-year period. Assuming this low estimate for the number of visitors, with the total costs for the exhibition amounting to 200 000 euros, the institutions have spent less than 7 euros per visitor, which is an excellent return on their investment.

The best way to guarantee the future of the exhibition is to integrate it permanently into the portfolio of the Deutsches Museum. In 2011, important discussions will be held to agree on the terms and conditions for transferring the management of the exhibition to the museum. Hopefully the story will be considered good enough "to be continued".

Biography

Barbara Wankerl has been the PR manager of the Excellence Cluster Universe since July 2007. Barbara holds a university diploma in biology from the Ludwig-Maximilians-Universität (LMU) in Munich. After her degree she completed a professional training to become a PR specialist and technical writer. She worked for several years as a senior consultant with the Munich-based PR firm Dr Haffa & Partner, where she was in charge of several accounts for international IT companies. In 2007 she joined the Technische Universität München to work in the field of science communication, first for the faculty of electrical engineering and later for the Universe Cluster.