

The Universe in Your City — Nineteen Capitals

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Key Words

Digital Mobile Planetarium
Public Outreach

Summary

The programme, The Universe in Your City — Nineteen Capitals, took us to each of Uruguay's nineteen provincial capitals. In each capital we erected our Kappa Crucis Digital Mobile Planetarium and were able to reach a wide range of children of school age, and especially children in "critical contexts" (i.e. socially and economically deprived children). We transported our equipment, together with the exhibition materials for the IYA2009 Cornerstone project, From Earth To The Universe — and set it up in open public spaces, staying in each location for one week and offering an average of nine daily 40-minute presentations. Each session featured information on Galileo Galilei's discoveries, the Uruguayan night sky and the cultural heritage provided by the sky.

A record number of 46 428 people participated in the 884 sessions held between April and September; while many more simply visited the exhibition. This reflects the remarkable success of the project.

Introduction

The Kappa Crucis Mobile Planetarium is a cultural enterprise dedicated to the promotion of astronomy. We have been travelling around the country since 2005, visiting a variety of educational and cultural institutions and offering sessions addressed to audiences of all ages.

Uruguay has a total population of over three million inhabitants, divided as follows: one and a half million people in Mon-

tevideo, the country's capital city, and the rest among nineteen departments. Each of the provincial capital cities that our project visited had between twenty and ninety thousand people.

The offer of scientific programmes, especially in the field of astronomy, used to be limited to the Municipal Planetarium, located in Montevideo. Since 2005 the Kappa Crucis Mobile Planetarium has enabled other, less central communities to have access to this kind of information.

The birth of The Universe in Your City — Nineteen Capitals

To celebrate the International Year of Astronomy, we decided to undertake an ambitious enterprise. We started planning in February 2008 and once our research was complete, we began the process of designing and constructing a dome to be used in the project. The construction was a demanding six-month endeavour. The dome is made up of 41 self-supporting



Figure 1. The Kappa Crucis Mobile Planetarium set up in a square in Colonia del Sacramento, a historic tourist place and capital city of the department of Colonia.

glass fibre and expanded polyurethane panels. It is 5.5 metres in height and 8 metres in diameter.

To enhance our presentations we used a digital projection system for planetariums, the Digitalium projection system, which offered a wide range of possibilities, ranging from ordinary sky projection to Full Dome capability.

As the dome was under construction, we prepared scripts to accompany the sessions. In order to do so, we counted on a multidisciplinary team composed of elementary and high school teachers, as well as professional and amateur astronomers. Teamwork enabled us to create one session which included Galileo Galilei and the importance of his discoveries, and adapt it to different levels, both in terms of age groups and cognitive competence. We also generated materials that would complement the sessions. The remaining phase was to make contacts and elaborate our step-by-step plan.

Objectives of the programme

Our general objectives were the following: firstly, to contribute to the process of popularising science and the development of the population's scientific culture; secondly, to motivate people, and most especially children, to approach astronomy and awaken their interest in topics related to the Universe; thirdly, to support teach-

ers' daily work by providing them with an advanced pedagogic tool. In addition, our main specific objectives were to promote scientific and technological knowledge in the framework of the International Year of Astronomy 2009, and to reach the nineteen provincial capital cities of Uruguay with the Digital Mobile Planetarium between April and October 2009, decentralising and democratising a cultural space for the promotion of science and technology.

At this point, it is interesting to remark on the cultural objective of the topics presented in our talks. Historically observations of the sky were carried out by native people in the south of our continent. Although there is no written record of whether the Charrúas — the main group of native inhabitants of Uruguay — observed the sky, there are a number of stories that have been transmitted orally down the generations about the observation of the sky and the interpretations that these ancient peoples made of what they saw.

That is why — beyond the technical explanations that we can give about the official constellations — we incorporate ancient stories into the content of our presentations to keep these stories alive for the generations to come. At the planetarium, we, for example, explain to the children about the method of orientation based on the constellation of the Southern Cross. To us, the Southern Cross is clearly cross-shaped. However, we show the children how, by joining the stars that form the

constellation in a different way, we can see the footstep of a ñandú (pronounced "nyan do", and known in English as the rhea), as seen by the ancients. The native people had represented in the sky one of the most useful creatures around them. This large, ostrich-like bird was a source of food and was present in their daily life. These native birds can still be found in the fields of the southern part of South America. Thus, since our children are familiar with these birds, they will remember and most likely share this story every time they look at the constellation.

The development of the programme

Our project consisted of installing the digital mobile planetarium for a week-long stay in each of the 19 capital cities of our country's departments, providing educational sessions for students at both the primary and secondary levels of schooling. In addition, there were similar sessions addressed to the general public. These presentations were accompanied by the exhibition, From Earth To The Universe, in the following way: a series of large images with backlit illumination were displayed alongside a 12-metre-long gallery providing access to the dome; the rest of the images were shown in digital form.

This working procedure meant transporting the equipment in three vehicles, i.e. a truck, a van and a private car, and hiring



Figure 2. Daniel Scarpa conducting a planetarium session.

eight people to put up the dome — which took ten hours — and later take it down — which took another five hours, following the same cycle in every location! Even so, on average, nine daily sessions were offered.

Each presentation lasted 40 minutes. During this time, participants not only learned about Galileo Galilei and the importance of his discoveries, but also had the chance to observe a projection of the night sky of Uruguay while being exposed to its significance in terms of our cultural heritage. Thus, at the end of each presentation, participants were assigned different tasks related to the observation of the sky at night to be performed on their own, regardless of their location. To help the participants carry out these observation tasks, we drew a map of the sky as visible from our latitude and gave it to teachers for further distribution to students.

Results

In order to accomplish our initial objectives, we also relied on thorough secretarial work from our headquarters in Montevideo. As each group of students arrived, the teacher was handed an evaluation form, where each teacher was required to enter his or her opinion or level of satisfaction by means of a specially designed scale, as well as given the opportunity to make further comments. In this way, we gathered and later processed information regarding the number of teachers attending and feedback on the project. We received 1222 completed forms. A grid was also used to keep a record of the schools and groups attending. The following figures summarise this section: total number of attendees: 46 428, distributed as follows: primary school students: 31 186; secondary school students: 6 135. General public:

7627; teachers: 1480. Among the many institutions that participated in this project, we included the following: rural schools (some of which had just three students; others a maximum of ten), kindergartens, and special schools, e.g., for the deaf, mentally challenged, adult schools and orphanages.

Conclusions

Employing such systematic procedures for data collection enabled us to arrive at the conclusions that follow: the project was highly successful and had a significant impact in each of the places visited. If we consider that, for 94% of the attendees, this was their first experience of going to a planetarium, we know that one of our main objectives — decentralising and democratising — was accomplished. The feedback gathered from both teachers and students on both the contents and the proposal was extremely favourable.

However, not only did the participants express their satisfaction with the event; the media provided support, due to the fact that, every time the planetarium reached a location, it attracted attention from the local people and it was given widespread media coverage. Uruguayan TV provided coverage of the project free of charge, in the belief that the programme deserved such treatment in view of its cultural interest and national scope.

Finally, the most positive result comes from the teachers' evaluation of the impact of the project in their classrooms: 89% said the project had an important impact; the remaining 11% not only agreed, but also provided additional feedback comments. These data allow us to project into the future and plan new and equally innovative activities to continue taking scientific and particularly astronomy-related knowledge to the different areas of our country.



Figure 3. The dome at the international square right on the Uruguayan–Brazilian border — with the two halves of the dome in different countries!

Biographies

Daniel Scarpa and **Antonio Mas** are Uruguayan amateur astronomers. They participate actively within the community of astronomers through their various activities. Since the opening of the Kappa Crucis Observatory (MPC 913) in 1999, they have made presentations in both national and international conventions. In 2001 they opened the first astroshop in Mercosur. In 2005, they introduced the first mobile planetarium in Uruguay and in 2009, the first digital planetarium.