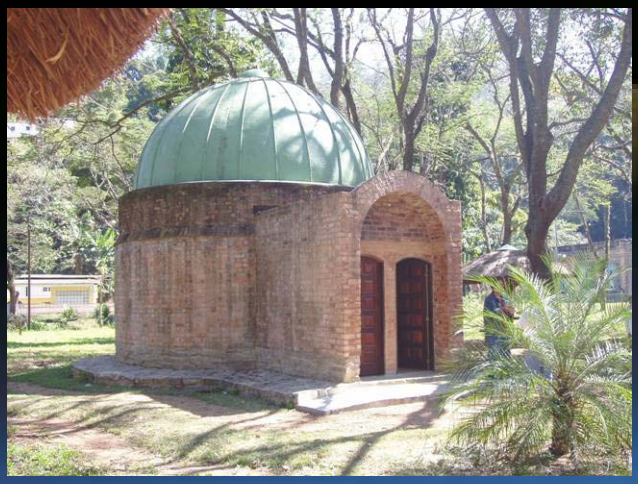
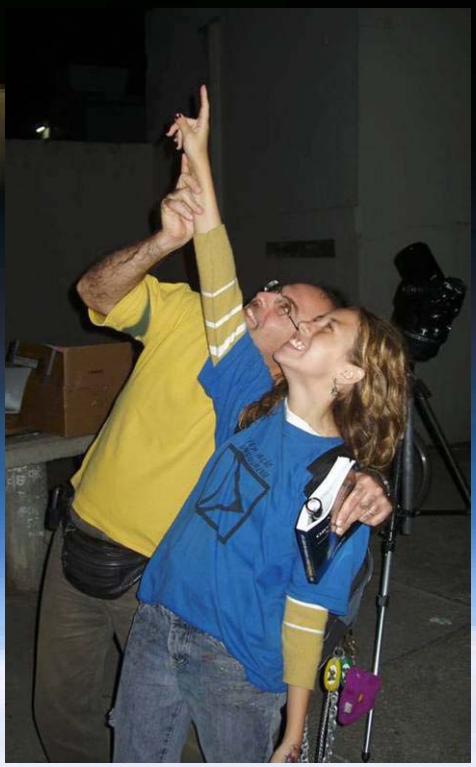
Permission to Dream
International Astronomy Education

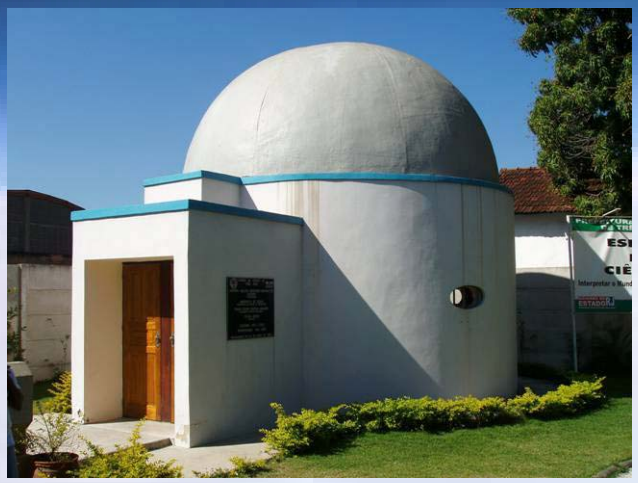
COMMUNITY PLANETARIUM INITIATIVE: BRAZIL CASE STUDY AND RECOMMENDATIONS

EXECUTIVE SUMMARY

October 24, 2003







Permission to Dream
12714 Matteson Ave.
Suite 5
Los Angeles, CA 90066
USA
(626) 833-5869

www.permissiontodream.org
director@permissiontodream.org

QUICK FACTS: PERMISSION TO DREAM

Identity: International science education NGO that uses astronomy to inspire and motivate children around the world, and to connect them across national boundaries.

Founded:	2001
Number of Schools Involved:	33
Number of Countries Involved: 15	
Countries:	Algeria, Australia, Brazil, Chile, China, Croatia, Iran, Israel, Nepal, Pakistan, Russia, Sri Lanka, South Africa, United States, Zambia.
Board of Advisors:	Dr. Buzz Aldrin Dr. Alan Hale Frank Braun George Whitesides
Major Sponsors:	Ahmanson Foundation Meade Telescopes Starry Night Software Keller Family Foundation Lufthansa
Website:	www.permissiontodream.org
Partners / Advisors:	Arthur C. Clarke Institute for Telecommunications Space Generation Advisory Council Cosmos Education Southwest Institute for Space Research.

This study would not have been possible without the strong support and guidance of the Cecierj Foundation, including its president, Dr. Carlos Eduardo Bielchowsky and vice president, Dr. Paulo Cezar Arantes. We also thank the wonderful members of the Grupo Imaginacao. Finally, we thank the Ahmanson Foundation of Los Angeles and Meade Corporation for providing the support to enable this and other projects.

COMMUNITY PLANETARIUM INITIATIVE:
BRAZIL CASE STUDY AND RECOMMENDATIONS

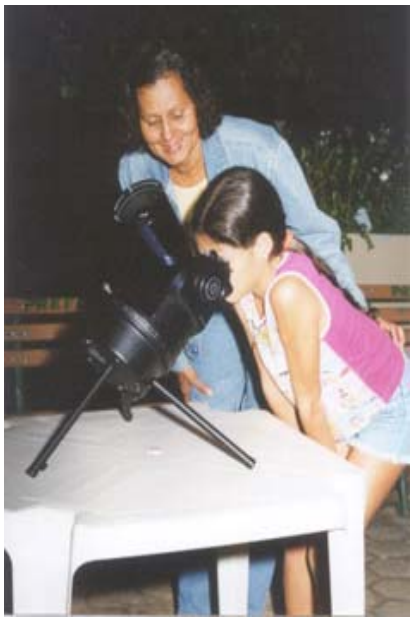
Introduction

The Permission to Dream program

Permission to Dream is an international science education NGO that seeks to inspire and motivate children through astronomy and space. It is a joint program of the Space Frontier Foundation and the National Space Society. Based in Los Angeles, PTD began by donating telescopes to developing or underprivileged communities. The focus of this report is a new initiative of PTD focused on community planetariums.

To date, PTD has sent telescopes to 33 schools or groups distributed across 15 countries and 6 continents. These telescope donations are augmented by other materials such as star charts and astronomy software. PTD has also created a six-part curriculum that guides students through an exploration of the night sky. This curriculum includes teachers guides and assignments, and is appropriate for learners from late primary school to early university. It covers the moon, Mars, Jupiter, Saturn, Venus, and the International Space Station, as well as a preliminary introduction to using a telescope.

The pedagogic philosophy that drives PTD is experiential education. We seek to give teachers tools to spark excitement in their students, which will motivate them in their in-class work. Where appropriate, we also seek to augment existing space-based curriculum. Finally, by connecting participating schools through the internet, we seek to encourage international communication, to raise awareness of our common heritage in the night sky, and to spread the culture of peace through space education.



A student in Rio de Janeiro observes through a telescope courtesy of Permission to Dream. February, 2003.

Community Planetarium Study

Background and Goals

In August 2003, PTD principals went on mission to Brazil to study community planetariums that had been constructed in the state of Rio de Janeiro. These planetariums, described in more detail below, were built for low cost, yet succeed in reaching a large number of local children.

The planetariums are ideal space education centers for the developing world. They combine experiential education with a permanent base and staff, enabling ongoing education into the foreseeable future.

The goals of the study were to research how the planetariums were constructed, including the public/private cooperative partnerships required; how successful the planetariums had been in teaching students; and how the concept of the planetariums might best be transferred to other regions and countries.

For the study, the PTD staff interviewed local government officials, national government officials, representatives of affiliated foundations, the designers of the planetariums, and the planetarium staffs themselves. On-site visits to two planetariums were made, and photographic surveys conducted. PTD staff derived a comprehensive view of the process through which the planetariums were created.

Our results indicate that the cost-benefit ratio of these centers is high: that is, the communities and the state derive high value from relatively low expenditure. Further, it seems clear that the design is eminently suited to transfer to other regions.

This document summarizes the major findings of the study. It outlines the process and history through which the planetariums were made, and sets out preliminary recommendations on how these valuable institutions can be brought to other countries.

Dr. Paulo Cezar Arantes of the Cecierj Foundation, and Prefeito Celso Jacob, the mayor of Tres Rios, the site of the first planetarium. They provided leadership for the planetarium program in Brazil. August 2003.

Community Planetarium Background

The Role of Cecierj Foundation

The concept of community planetariums was born in the Cecierj Foundation, a prominent and successful educational institution based in the state of Rio de Janeiro. Cecierj has two areas of focus: remote education, and science education.

Cecierj is currently in the process of building a number of regional learning centers through the state of Rio. These learning centers integrate remote and in-person teaching to provide higher-quality instruction than might otherwise be possible.

In 2000, Cecierj had begun a program of building community science centers in conjunction with these regional learning centers. To augment the centers, Cecierj had purchased a portable, inflatable planetarium from abroad.

This portable planetarium had serious limitations: the projection quality was not high, and the temperatures inside the structure often became too high to be comfortable. Yet Cecierj staff valued the planetarium experience as it seemed to have a strong effect on the children.

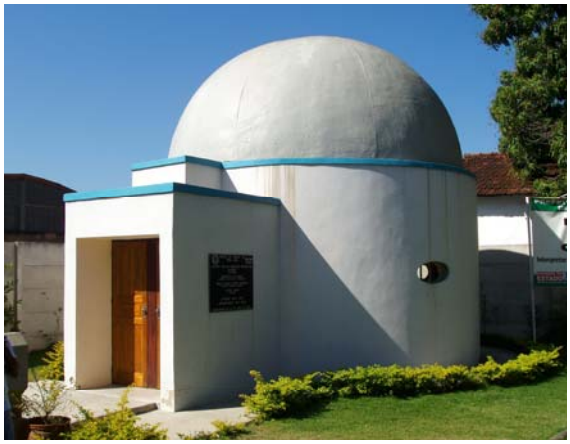
Cecierj leadership realized that they could build a permanent planetarium structure in Brazil for about the same cost as the portable inflatable structure from abroad. With this insight, they began to assemble a team of local and national government support to make the project happen.

Planetarium Case Study 1
Tres Rios

The Ceceirj Foundation worked closely with partners at the local government level and state government level to construct the first community planetarium.

The first step came when Cecierj created a detailed proposal, including designs for the structures and a budget for the project. Importantly, the estimated cost of the permanent structure was less than the US $40,000 cost of the inflatable planetarium. This proposal was then sent to the science advisor of the state government as well as the mayor of one of the cities hosting a regional learning center.

The chosen city, Tres Rios, was selected primarily because the mayor himself, Prefeito Celso Jacob, had expressed enthusiastic support for the idea in informal preliminary discussions. Tres Rios is about 2 hours by car from the city of Rio de Janeiro, in a beautiful location where three rivers converge. It has approximately 80,000 inhabitants, and approximately 15,000 students.



The first community planetarium in Tres Rios, Brazil. It is sited adjacent to a community science center on the same property. August 2003.

The Tres Rios local government gave the project momentum when it pledged to donate a piece of land to the community planetarium, as well as to pay for the staff of the planetarium on an ongoing basis. All that was left was funds to construct the building itself.

These funds were committed by the Rio state government, which is strongly allied with the Ceceirj Foundation. With these funds committed, the final design and planning stage could be completed. A company was formed to execute construction of the building, which was done in less than three months.

While construction was ongoing, Ceceirj conducted two important tasks: to finalize development of the projector system, and to train the planetarium guides. The projector design is critical to the success of the overall planetarium, and was accomplished using relatively simple technology for significantly less than US $10,000. The guides were trained by Cecierj representatives over the course of three months.

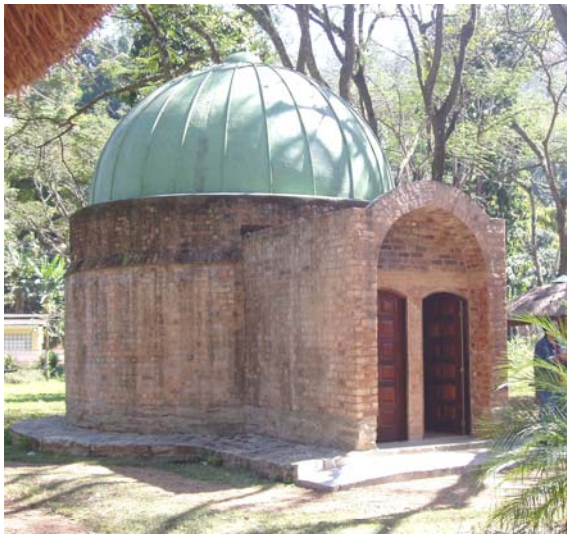
The result of construction was an elegant two story building comprising a lower media room and the upper domed planetarium. The walls are concrete and the dome roof is fiberglass. Each room can hold approximately 30-40 students. The lower room is suited for projection of films and videos related to astronomy and space.

Measures of success
Between the opening of the Tres Rios planetarium and August 2003, over 10,000 students have come through. This is a remarkable number for a relatively small building, and it is a testament to the commitment of the local school system and local government to make good use of the resource.

Students get instructed in both regional mythology of the skies, as well as the science of astronomy. The planetarium guides are trained to be both accurate and engaging. They put on a great presentation.

Planetarium Case Study 2
Paracambi

The second planetarium constructed by the team was sited in Paracambi, a town about an hour away from the city of Rio de Janeiro. The basic pattern of Tres Rios was followed: the local government donated land, the state government put in construction funds, and Ceceirj managed the project and trained the staff.



The second community planetarium in Paracambi, Brazil. It uses bricks recycled from local buildings for a beautiful authentic appearance. August 2003.

The site was the elegant former grounds of a textile factory. The factory building is now occupied by a music school. The planetarium was built on the wide green space in front of the school building.

Constructed using bricks recycled from the textile complex, the planetarium has a beautiful appearance that fits well with the overall style of the compound. In order to be ready by a special municipal event, construction was finished in only three weeks, by three teams of workers going in three round-the-clock shifts.

The Paracambi planetarium is the same fundamental design as that in Tres Rios. However, it integrates some important innovations, including a bathroom, wooden flooring and seating on the dome level. The lower multimedia room is also fully outfitted with school chairs, a computer, a digital projector, and a VCR.

A third planetarium is now under construction in Nova Friburgo. It will integrate another innovation: a concrete dome, which is expected to keep the structure even cooler during Brazil's hot summer months.

Benefits
How the Planetariums Aid the Local Community and the Nation

The benefits of the community planetariums were found to be manifold.

Above all, the centers bring a type of experiential science education to students who would not otherwise have that opportunity. The low cost and high quality of the facility enable municipalities throughout the developing world to construct similar structures. The children are educated in the science of the stars, as well as the cultural history of astronomy.

The Manguera astronomy club of Rio de Janeiro, Brazil. This club formed around a telescope donated by Permission to Dream. August 2003.

Second, the facility is sustainable. During the mission, the PTD team made a visit to the capital of Brazil, Brasilia, and went to see that city's planetarium. This structure, while large and equipped with a Zeiss projection instrument, was not open to the public and in a poor condition. Part of the reason for this unfortunate situation may be that the required costs to staff and maintain are too high for the local government to cover. The smaller size and sustainable operation render the Community Planetariums more appropriate for wide diffusion throughout the developing world.

Third, the community planetariums create a new local tourist attraction, and a source of public pride. The Paracambi planetarium was prominently featured in new tourist literature for the city. Residents expressed strong pride that their city had been chosen to host this special resource.

Fourth, the planetariums provide a source for higher technology employment for the local community. The Tres Rios center was staffed by roughly ten people, and the jobs were viewed as desirable by the local community.

Finally, the planetarium complements other innovative learning resources in the local area, including the adjacent science centers and the remote learning centers. The planetarium becomes another important nexus for community and educational development.

Lessons for Other Nations
Transferring the Resource to other Developing Regions

The process through which the community planetariums were constructed is a model for other countries and regions to use. Its collaborative process enabled the centers to be built quickly, for low cost, with high quality. It also established a sustainable operation that will continue for a long time to come.

Permission to Dream recommends that this process be brought to other nations as soon as possible. It offers other nations a high cost-benefit ratio; bringing experiential science education to children who would not otherwise receive it.

The Sirius Astronomy Club of Algeria, a recipient of a Permission to Dream telescope in September, 2002. Algeria and other Islamic nations are strong candidates for community planetariums, considering the strong heritage of astronomy research in Islamic history.

Two regions that would be highly appropriate for such centers are the Middle East and Asia. Both regions have extensive heritages of astronomy exploration. These histories can be built on as sources of regional pride, fostering in students their own pride and self-confidence in learning.

PTD recommends that a trial community planetarium project be started in both Asia and the Middle East. A candidate for Asia could be China, with its recent successful human spaceflight. Candidates for the Middle East could include many countries, including the Gulf States, North Africa, Turkey or Jordan. Permission to Dream already maintains connections to many of these nations.

Critical to the success of these trial centers will be the same combination of assets that made the Brazilian planetariums so successful: collaboration between state and local government; a project manager with experience in such projects; in-kind donations of land where possible; pledges of ongoing support to ensure sustainability.

Finally, it is hoped that any future centers can be interlinked internationally, possibly through the Internet, building a shared culture of exploration and peace. Permission to Dream has experience in building such an international community, and stands ready to help as needed.