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MOBILE PLANETARIUM SYSTEM SIDEREUM I

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RESUMEN

Presentamos el diseño y construcción de un sistema de proyección para un planetario móvil con buena calidad óptica y utilizando materiales disponibles en el mercado nacional.

ABSTRACT

We present the design and construction of a projection system for a mobile planetarium, with good optical quality, made with materials of easy acquisition in the country.

Key Words: outreach

1. INTRODUCTION

Every modern society needs to implement encouraging mechanisms and promotion of the sciences and the technology to everyone. Historically, the astronomy has been a window on the motivation of large populations, the basic sciences, the astronautic and the technology in general. But a huge number of factors restrict the sky observation (weather, distance, insecurity, sky luminosity, epoch, etc). The planetarium has been developed in this way to simulate the sky in large domes, in which the different constellations, stars, planets, meteors, comets, etc. are projected. This produces a huge encouraging visual impact, especially on teenagers and children.

1.1. *Objectives*

- Design and construction of the original system of the Planetarium Projection, located in an intermediate level between the portable and the professional planetarium.
- Use of materials and parts of easy acquisition in the country.
- Offer of a high quality product in relation to an accessible price, compared to the commercial models.
- Development of a system of portable and inflatable domes appropriate for the designed projector.

2. BACKGROUND

In 1924, the German firm Karl Zeiss, by a request by the Museum of Science in Munich, launched the first planetarium system after 20 years of development. In Venezuela, we could not find any data of someone who had developed a planetarium system designed with local technology, not even the most basic models ever.

2.1. *Big Format Planetarium*

2.1.1. *Opto-Mechanicals*

- Zeiss (Germany)
- Spitz (USA)

2.1.2. *Digitals*

- Digistar
- Goto
- Definity

2.2. *Portable Planetarium*

They are small and cheap, but the image quality is low and the only can handle small groups.

- Starlab.
- Cubex.
- Cosmodissey.

2.3. *Venezuelan Planetarium*

- Planetario Humboldt, Parque del Este, Caracas. Zeiss.
- El Museo de los Niños, Caracas. Digistar.
- Planetario Simón Bolívar, Maracaibo. Zeiss
- Fundación La Salle, Margarita. Spitz.
- CIDA- Museo de Ciencia y Tecnología, Mérida. Starlab.
- Approximately ten private planetaria. Starlab.

2.4. *Current Situation*

There are only three of big and medium size (Humboldt, Museo de los Niños and Maracaibo). These institutions play the role of promoters in a local area, but without notable projections towards the local community and a little in the country. Therefore, the encouraging impact is much reduced. There

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are some other 10 small inflatable planetaria that have very limited services and are private (except CIDA). The medium and large format planetaria are extremely expensive, while the inflatable ones are very limited and uncomfortable, they cost between Bs F. 25 to 40 thousand. On the other hand, the low promotion of the astronomy by the educative and scientific organisms has historically encouraged an scarce number of professionals interested in astronomy.

3. THE PROJECT "PLANETARIUM SIDEREUM I"

As a starting objective, the project intends to offer a planetarium of medium size, relatively portable, with excellent relation between quality and price and diverse promotional deals. Due to the lack of planetaria in Venezuela, it is necessary to design a project that promotes the proliferation of those instruments in different cities of the country. If a program for the construction of mobile or Portable planetaria were implemented and developed in the country, as a way to satisfy the various promotional needs at high schools, schools, cultural centers, etc. That program would accelerate highly the general motivation of the population for the science and technology. Since we expect a high promotion, the different communities in the country will count on a very attractive scientific option. This opportunity would incline towards the improvement of the level of interest by children and teenagers who would tend towards the science and technology. The mobile character of the planetarium would offer the marvelous promotional and pedagogical advantages to the different communities in those systems.

3.1. *Features/Properties*

- Opto-Electric-Mechanical of 41 fields, conventional lenses.
- Independent projectors for constellations, planets, sun, moon, milky way and coordinates system.
- Environmental light system to simulate the dawn, the sunset and the clouds.
- Traction system in two axes: latitude and right ascension.
- Moon projector with a changing phase mechanism and superficial and visible details.
- Canvas and aluminized Dome of high tenacity. It is inflatable and it is 9 meters, 80 people capacity and comfortable entrance.
- The optic design can project the less bright stars from 7 magnitude (up to 15.000 stars); achieving an impressive realism.

3.2. *Basic Presentation Tour Celeste*

- The sunset and the twilight.
- Mythological introduction of the sky.
- Description of the elements of the sky-blue sphere.
- Modern constellations.
- Description of the main constellations: Mythology, main stars, nebulas, galaxies, cumulus, among others.
- Final dialogue.
- Dawn.