

Estrelleros: Astronomy in hospitals

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Abstract. This project is designed for children under 18 years that have to frequently visit hospitals or that have to endure long-term hospital stays. The aims are to entertain these children and their families, to increase their scientific culture, and to promote scientific vocations. So far we have visited one hospital in Mexico City bringing astronomy to the patients and their families. We have developed five hands-on activities and one musical activity that ensures that all the children can participate independently of their conditions. We plan to expand this project to other hospitals and other cities in the country. Our next challenge is to start virtual visits to hospitals.

1. Introduction

Spending long-term stays in a hospital is an unpleasant experience for anyone but it is even worst for children that are hospitalized. They are bedridden while their friends are attending to school, playing in the park, or at the cinema.

Ludic activities in hospitals have proven to be very beneficial for children. [Bermudez Rey \(2009\)](#) listed an extensive list. According to her study these activities may contribute to: 1) Implement and develop the rights of hospitalized children, 2) Occupy their free time, 3) Improve their quality of life, 4) Counteract the problems derived from the monotonous life in hospitals, 5) Improve the integration of hospitalized children, 6) Reduce stress, anxiety, and isolation that generates hospitalization, 7) Contribute to normalize the situation, 8) Avoid the possible appearance of psychological problems, 9) Discover or affirm competences and abilities in the children, 10) Improve the self-esteem of the hospitalized children, 11) Develop creativity, 12) Restore the personal perception of control and competence, 13) Increase the cultural heritage, 14) Develop emotional bonds between participants, 15) Relieve parents of the physical and emotional burden.

Some of the benefits mentioned above are precisely some of the goals of outreach activities, in particular of our project. For example to enhance scientific culture, to develop creativity, and to discover or affirm competences and abilities. We want to use



Figure 1. A group of children and their families are building a space rocket following the instructions of the volunteers. As on that visit it rained, the activities were carried out in the hospital lobby.

astronomy as a tool to improve the stay of children in hospitals and we want to use hospital lobbies and rooms as places to promote science. Astronomy has always fascinated humans. It has many advantages over other scientific disciplines. We can use awesome images of galaxies, planets, and stars to generate curiosity and to attract people to science.

In the world there are some educational projects in hospitals that include astronomy among the subjects that are taught to the children. Astronomy activities are also included in the list of recreational programs in hospitals (along with clowns, storytellers, etc.). Two examples carried out in USA and Spain are described by [Lubowich 2008](#); [Alonso-Floriano, Cortés-Contreras, Pereira 2015](#). We are not aware of any astronomy outreach project in hospitals, besides ours, in Mexico (and probably in Latin America).

2. The project

The project “Estrelleros: Astronomy in hospitales” is funded by the Consejo Nacional de Ciencia y Tecnología (CONACyT) and by the Instituto de Astronomía de the Universidad Nacional Autónoma de México (UNAM). Our main goals are: 1) to entertain the hospitalized children (and their families), 2) to increase scientific culture, and 3) to encourage scientific vocations. More information about this project is provided in the webpage www.estrelleros.org.

In 2019 we visited four times the Hospital Shriners in Mexico City (see some photographs of the visits in Figures 1–4). This hospital provides care for children until age 18 with orthopaedic conditions and burn injuries. This forced us to create a variety of activities so that all the children with any condition can participate at least in a few of them. For example, all children (independently of their conditions) can participate in the activity “The music of the Universe” where music is the only tool we use to teach about chemical composition of the Universe.



Figure 2. A little girl is observing the Sun through a telescope with a special filter in the central garden of the hospital. This activity is one of the most successful ones together with the planetarium.

A typical visit included around 20 volunteers (students and academics) mainly from Instituto de Astronomía of the UNAM. Each visit lasted around four hours. The visit started with one brief conference without slides in the hospital waiting room. Then, the children chose among different activities: a mobile planetarium, a telescope to observe the Sun, and a few hands-on activities plus the musical activity mentioned above. Children learned about the components of spiral galaxies, our solar system, the chemical composition of the Universe, space exploration, and sundials. Occasionally we were able to visit children in their rooms. Around 120 people (between children and their families) participated in the different activities each day.

3. Next steps

Our next goal is to expand the project. On the one hand we want *Estrelleros* to visit other hospitals in Mexico City and in other cities of the country. To do this we will collaborate with astronomers in different locations. We will provide them all the material they need to carry out a typical visit. In 2020 we wrote a manual that includes the instructions for the six hands-on activities available at this moment (we have created



Figure 3. A contest to guess the scents of different objects in the Universe is taken place in the lobby.



Figure 4. The group of volunteer astronomers that visit the hospital.

one new activity about spectroscopy). We are also in the process of generating short videos with visual instructions. On the other hand, we have plans to start virtual visits. Due to the global pandemic we could not visit any hospital in 2020 and it is uncertain when we will visit hospitals in person again. This is a challenge for us and at this moment

we are exploring possibilities. If we are able to carry out virtual visits we will be able to reach much more hospitals and children.

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