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Itinerant Educational Observatory: 25 years on the road

M. G. Rodrigues, B. M. Silva, & D. B. Pavani

[1] Universidade Federal do Rio Grande do Sul
e-mail: marinaagrss@gmail.com, biancaastronomy@gmail.com, dpavani@if.ufrgs.br

Abstract. For 25 years, the Itinerant Educational Observatory (OEI) of the UFRGS Institute of Physics has had a significant impact on scientific education, bringing astronomy and natural sciences to public elementary and high schools in various states across Brazil. Through hands-on activities such as astronomical observations, experiments, and planetarium sessions, the program has sparked scientific interest in thousands of students. Additionally, the OEI has offered continuous training courses for teachers, equipping them to use astronomy as an effective educational tool in their classrooms. The program fosters the development of collaborative networks between schools and universities, aiming to create a more enriching learning environment with greater opportunities for public education.

Resumo. Há 25 anos, o Observatório Educativo Itinerante (OEI) do Instituto de Física da UFRGS realiza um trabalho de grande impacto na educação científica, levando a astronomia e as ciências naturais para escolas públicas de ensino fundamental e médio em diversos estados do Brasil. Por meio de atividades práticas, como observações astronômicas, experimentos e sessões de planetário, o programa desperta o interesse científico em milhares de estudantes. Além disso, o OEI tem oferecido cursos de formação continuada para professores, capacitando-os a utilizar a astronomia como uma ferramenta didática eficaz em suas aulas. O programa promove a formação de redes de colaboração entre escolas e universidades, buscando criar um ambiente de aprendizado mais enriquecedor e com maiores oportunidades na educação pública.

Keywords. Science Outreach

1. Introduction

This article presents an account of the experience of the Itinerant Educational Observatory (OEI), an Extension Program of the Institute of Physics at UFRGS, during the year 2024. It reflects on its impact on students and the training of both Basic and Higher Education teachers. In 2024, the program celebrates 25 years of activities, reaching urban and rural areas of Rio Grande do Sul, as well as regions in Santa Catarina and Paraná. Its initiatives aim to contribute to the ongoing professional development of Basic Education teachers, with a focus on the teaching and dissemination of astronomy and physics. The program's activities include the use of a digital planetarium, telescopes, and educational experiments. Over the past 25 years, the OEI has diversified its actions, leading to the creation of three additional extension projects.

Figure 1. Photo of the truck purchased with funding during the first phase of the program.

2. The Beginning and the Journey of the Program

In its first phase (1999–2011), under the coordination of Professors Horacio Dottori and Basílio Santiago and with financial support from CNPq and the VITAE Foundation, the program acquired telescopes, educational materials, and a vehicle for transporting equipment and team members (Fig. 1). The team consisted of teachers and graduate students. Activities included continuous training courses in astronomy for Basic Education teachers, featuring sky observations in the three southern states of Brazil.

These activities were carried out on demand, primarily in response to requests from education departments, with a workload ranging from 20 to 40 hours. The training courses combined theoretical and practical lessons, including physics and astronomy experiments designed to explore concepts such as parallax, pendulum motion, and the solar constant. During this period, hypertexts were developed to support classes and participant studies. This phase also marked the creation of the project's first website, which remains accessible today and continues to provide educational materials (OEI Archive, 1999).

In its second phase (2011–present), under the direction of Professor Daniela Pavani, the program expanded to include workshops in schools, lectures, distance learning courses in collaboration with the UFRGS Planetarium Prof. José Baptista Pereira, participation in Book Fairs and Scientific Exhibitions (Fig. 2), in addition to teacher training courses. The Itinerant Educational Observatory gave rise to three new extension programs: one focused on collaboration between universities and schools to produce educational sequences in astronomy (Adventurers of the Universe), another promoting girls in science (www.ufrgs.br/meninasnaciencia), and a third interacting with Indigenous communities (Juruá Astronomy). The second phase of the project took place in parallel with the creation of the Bachelor's degree in Astrophysics, thus, undergraduate students joined the team as activity monitors.

Figure 2. Photo showing the educational experiments with kids in a school.

Figure 3. Photo showing the digital planetarium at a school's gym.

In 2020, the program expanded further with the establishment of a collaboration with the UFRGS Itinerant Digital Planetarium, reinforcing its mission of bringing astronomy education to broader and more diverse audience (Fig.3)s.

During the Covid-19 pandemic, activities transitioned to an online format, attracting participants from various Brazilian states. With the resumption of in-person activities, the program integrated a mobile digital planetarium, educational experiments, and sky observations using telescopes and binoculars. Additionally, the OEI became part of the Southern Planetarium Network, collaborating with federal institutions to conduct planetarium sessions and inspire youth interest in science. This partnership has played a crucial role in strengthening the curricular integration of outreach activities (OEI, 2018).

3. Conclusion

Over the past 25 years, the Itinerant Educational Observatory has traveled a distance equivalent to more than three trips around the Earth, offering astronomy courses for teachers, astronomical observations, educational experiments in astronomy and physics, and mobile digital planetarium sessions. More than 40,000 students have been reached, including 20,000 who participated in planetarium sessions alone. The project remains active and continuously evolving, providing ongoing training for teachers and students while promoting science dissemination. By engaging undergraduates, technicians, and professors, the OEI fosters knowledge and curiosity, further strengthening the connection between the university and the community.

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