

## O Observatório do Valongo de Portas Abertas

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**Abstract.** Outreach is one of the pillars of modern university development, being responsible for the society-university connection and communication. The Observatório do Valongo (OV), an institution of historical significance for Brazilian astronomy, consolidates its outreach activities through several projects, one of them being the “O Observatório do Valongo de Portas Abertas”. This project came into existence in 2015 with the aim of promoting public visitation sessions on the OV *campus* while also utilizing the observatory’s major museological collection of astronomical devices as a tool for public immersion. Such initiative strengthens the observatory’s museological significance, as well as its efficiency in science communication and the qualification of its students in the Astronomy undergraduate programme. Over the years, the reached audience has grown, making the project one of the OV’s main outreach activities and also contributing to the genesis of other outreach enterprises. In this work, we will present an overview of the project activities, methodology, statistical data on the increase the audience over the years, new means of interactivity during astronomical sessions, and the contribution of undergraduate students to such sessions. Additionally, we will discuss the synergy between the “O Observatório do Valongo de Portas Abertas” and the local community, as well as the success of this project as a medium for science communication.

**Resumo.** A extensão universitária é um dos pilares para a consolidação da Universidade moderna, sendo a responsável pela conexão sociedade-universidade. O Observatório do Valongo (OV), instituição de importância histórica para a astronomia brasileira, consolida sua atuação extensionista por intermédio de diversos projetos, entre eles o ‘O Observatório do Valongo de Portas Abertas’. Este projeto foi iniciado em 2015 com o intuito de promover atividades de visitação pública, usufruindo do vasto acervo museológico do OV como ferramenta de imersão do público. Esse projeto consolida a importância museológica do Observatório, bem como a divulgação científica feita por ele e a formação de graduandos do curso de Astronomia. Com o decorrer dos anos, o público alcançado cresceu, tornando o projeto uma das principais atividades de extensão do Valongo, e se estabelecendo como alicerce para a criação de outras ações de extensão. Neste trabalho, apresentaremos um panorama das atividades do projeto, metodologia, dados estatísticos relacionados ao público atendido ao longo dos anos, as novas formas de interatividade durante as sessões astronômicas e a contribuição discente. Além disso, discutimos a sinergia entre “O Observatório de Portas Abertas” e a comunidade local, além do sucesso do projeto como veículo de divulgação da ciência.

**Keywords.** Extensão universitária – Acervo Museológico – Observatório do Valongo

### 1. Introduction:

The Observatório do Valongo (OV) plays an important role in Brazilian astronomy. Located at Morro da Conceição, downtown Rio de Janeiro, OV holds the distinction of being the first institution in Brazil to offer an Astronomy undergraduate programme. Currently, OV is part of the Centro de Ciências Matemáticas e da Natureza (CCMN), and like many other scientific and educational institutions in Brazil, its academic activities have three cornerstones: teaching, research, and outreach (2). Regarding the last one, the “O Observatório do Valongo de Portas Abertas” project promotes public activities since 2015, inviting the public to explore the observatory’s *campus* and participate in several astronomical observations and museological activities. Another important discussion is related to the influence of OV’s activities on undergraduate education and behavior. The project is also active on social media platforms, such as Instagram and Twitter, which play a crucial role in publicizing its activities.

### 2. The project:

The core idea of the project is to integrate society and the university through astronomy. To achieve this, the project offers two distinct activities, being those a daytime one and a nighttime one. During the day, the focus is on the museological repertoire, while



FIGURE 1: The first image captured on a traditional Wednesday astronomical session, showcasing both the public and the team gathered in front of a star trail photograph. The second image reveal a public visiting session at the Cooke & Sons Refractor dome. Credits: Daniel Mello, Roberta Cosmala and OV

at night (specifically on the traditional Wednesday observation activities) sky observation seamlessly intertwines with the museological collection, creating a perfect storm for science communication. We delve deeper into this interaction in Section 4. A project like this holds crucial significance in various scenarios.

Among them is the promotion of the OV within the historical and cultural circuit of Rio de Janeiro's Port Zone, fostering community engagement and instigating critical thinking among visitors. Additionally, it serves as a foundational project, catalyzing the creation of other outreach Valongo projects (1) such as Astronomy Through the Window and several specific astronomical events. It is imperative to highlight that this project is an in-person outreach initiative, where social media serves as a vital ally to its publicization. Furthermore, the OV has significant influence on the visitors such as teachers and students of Rio de Janeiro regular educational schools and residents of Morro da Conceição, which is the site where it is located. This community is predominant among visitors, revealing an important social aspect of this project.

### 2.1. The team:

From the preceding discussion, it is evident how crucial the team is in enhancing the quality and attention given to the individuals visiting the observatory. This project boasts a diverse set of people, including astronomers, undergraduate students, and external collaborators. The significance of delving into this topic lies in understanding the impact an outreach project like such has on the development of undergraduate students' competences. They are exposed to new environments and experiences not typically acquired within a classroom setting. For astronomers, it offers an opportunity to share knowledge with the public, while external collaborators gain valuable experience and insights on working in an astronomical setting, fostering new perspectives and knowledge. The collaboration among diverse members introduces new interaction techniques for the public, such as astrophotography, enabling them to perceive the sky in a more artistic and wide perspective.

### 3. The museum collection as an immersion tool:

The allure and magnificence of astronomy captivates the public, making it a gateway to science, as discussed by (4). Consequently, an effective means of evoking these emotions is through the museological collection. These artifacts, coupled with the OV's exceptional structure, impact a distinctive sensation to visitors. Notably, astronomical devices like the imposing Cooke & Sons Refractor (Figure 1) and Carl Zeiss Jena 6" f15 Coudé Refractor heighten the public's sense of the astronomical environment. Integrating the teaching of history alongside the history of astronomy is undeniably the most didactic approach to promoting Brazilian astronomy (? 3).

### 4. The project in numbers:

Over time, we have quantified the project's performance and conducted statistical analyses of the public to understand how the activities have evolved. In Figure 2, it is interesting to discuss several aspects of such transformations. Firstly, there is a clear evolution in the number of visitors over the years. It is essential to comment on the weather conditions; certain years are most affected by meteorological conditions, leading to the cancellation of nightly activities unfortunately. Figure 3 is also linked to the argument of weather conditions, but it also takes into account the influence of social media effects. The optimal period for our activities is between May and August, which coincides with the vacation period and the driest season. The online engagement, in addition to the public that visits the observatory in-person, promotes a foundation from which to build new enterprises, this

ensures visibility to new activities and outreach events, specially when they are just coming into being.

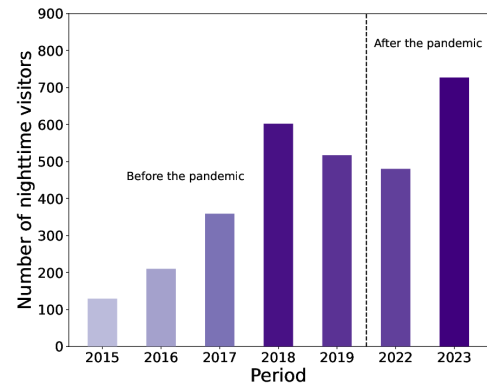


FIGURE 2: OV visitors in the period between 2015 - 2023.

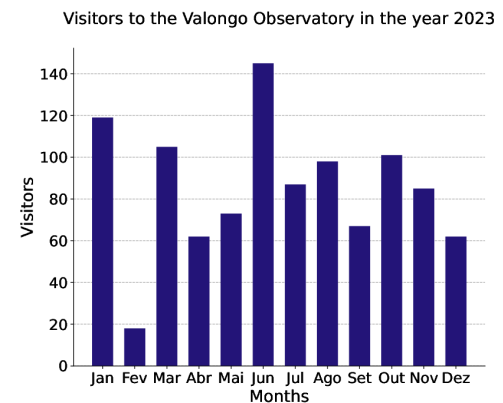


FIGURE 3: Annual distribution of OV visitors in 2023. The peak of the distribution reveal that we best period is between May and August.

### 5. Conclusions:

In summary, the several impacts of this project are undeniable, reaching a wide range of societal environments, including the local community surrounding the OV and the education of undergraduate Astronomy students. This project serves as a foundation for the OV, giving rise to other projects alike and solidifying the outreach activities of the observatory. The statistical analysis of these activities is a crucial tool to assess the project's influence and to emphasize the team's importance for the success of these endeavors. On the other hands, they prove the outreach project consolidation among these years and establish the OV activities as essential to science communication nowadays.

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