

Two years of *Astronomia Através da Janela*

Interactivity and scientific divulgation

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Abstract. The project Astronomy Through the Window (ATW, *Astronomia Através da Janela* in Portuguese), linked to Federal University of Rio de Janeiro Valongo Observatory Outreach Program, aims to disseminate Astronomy to reach and encourage the participation of all audiences in science through astrophotography, both professional and amateur. This project began in the COVID-19 pandemic context, when people were confined in their homes, but with the possibility of stargazing through their windows. Therefore, Valongo Observatory proposed an interactive project, encouraging netizens to participate by sending photos of the sky taken at home. Ergo, the project has already received more than 400 photos, sent from different locations in Brazil and other countries. These images are published in ATW official website and social networks with their copyrights and credits, including information on the astronomical object and celestial configurations observed with a free interpretation on the art in the background. The received photos are also used to supply the ATW scientific communication material, making the project essentially collaborative/interactive. In addition to creating a gallery with selection of images on social networks, Astronomy Through the Window promotes lives on YouTube about "*Tips for observing the Night Sky*", for observing the main phenomena in night sky of each month and specific datetimes of the year, to make them easier to identify. From the lives, contact with public occurred more intensely, as it being a hybrid format, synchronous and asynchronous, using live chat messages for greater interactivity, moreover to mediation in subsequent comments of the video on YouTube platform. In this work, we present the project's methodology, addressing both the dissemination made on social networks (Facebook, Instagram, and Twitter) and lives on YouTube, as well the interaction with public. We also present the results arising, the new perspectives and the impact of ATW for the participants throughout its two years of activity.

Resumo. O projeto *Astronomia Através da Janela* (AAJ), vinculado ao Programa de Extensão Letramento Científico da UFRJ, tem como objetivo divulgar a Astronomia de forma a atingir e fomentar a participação de todos os públicos na ciência por meio da astrofotografia, tanto profissional quanto amadora. O projeto surgiu no contexto da pandemia de COVID-19, quando as pessoas se encontravam reclusas em suas casas, mas com a possibilidade da observação do céu através de suas janelas. Assim, o Observatório do Valongo propôs um projeto interativo, incentivando os internautas a participar enviando fotos do céu feitas em suas casas. Desta maneira, o projeto já recebeu mais de 400 fotos, enviadas de diversas localidades do país. As imagens são divulgadas no site oficial e nas redes sociais com os devidos créditos, incluindo informações sobre o astro observado, as configurações celestes observadas e uma leitura livre da arte por trás das imagens. As fotos recebidas são utilizadas também para abastecer o material de divulgação do projeto, tornando-o essencialmente colaborativo/interativo. Além da criação de uma galeria com seleções das imagens nas redes sociais, o *Astronomia Através da Janela* promove *lives* no YouTube sobre "*Dicas do Céu*" para observação dos principais fenômenos no céu noturno de cada mês e épocas do ano específicas, de modo a torná-los mais fáceis de identificar. A partir destas *lives*, o contato com o público se deu de forma mais intensa, por ser um formato híbrido, síncrono e assíncrono, utilizando os comentários do *chat* ao vivo para maior interação, além da mediação nos comentários posteriores do vídeo na plataforma do YouTube. Neste trabalho, apresentamos a metodologia do projeto, abordando tanto a divulgação feita nas redes sociais, (Facebook, Instagram e Twitter) quanto para as *lives* no YouTube, assim como a interação com o público participante. Apresentamos também os resultados advindos do projeto, as novas perspectivas, bem como o impacto do AAJ para os participantes do projeto ao longo de seus dois anos de atividade.

Keywords. Teaching of Astronomy – Light pollution

1. Introduction

Mankind had always been fascinated by the starry sky. Since the flourishing of man in Prehistory to the present times, Astronomy seeks to understand how the Cosmos works. With the scientific development that took place from the 19th century onwards, new technologies were developed, allowing man to transform the planet around him. We built big cities, went through industrialization, shortened distances, and reached the accelerated days with liquid limits of Postmodernity (Bauman 2001). All this scientific and technological development also had a contribution from Astronomy.

In early 2020, the COVID-19 Pandemic broke out, affecting the entire world population. Thus, we had to adapt to a more secluded lifestyle, due to sanitary conditions, but no less inter-

active. However, the confinement rekindled an ancestral interest in the population, the desire to stargaze.

2. Astronomy Through the Window

Due to the quarantine period established by the authorities, UFRJ Valongo Observatory had to suspend face-to-face outreach and dissemination activities (Paula 2013) in Astronomy. This was when *Astronomia Através da Janela* - Astronomy Through the Window project (hereinafter ATW) emerged, with the aim of keeping active the work of scientific dissemination by encouraging the population to observe the sky through the window of their homes or at their backyards, thus bringing people closer to Astronomy. The project also benefits from the possibility of greater reach, as it uses the internet as a medium of communica-



FIGURE 1. YouTube thumbnail of ATW August 2022 live broadcast.

tion with its audience, therefore bringing together not only people from different locations, but also making it more democratic, as it enables the participation of people from different social conditions.

Thus, we encourage the public to send us their own astrophotographs taken by common or professional cameras, or even cell phones, being captured directly from their homes. In this way, we created a gallery on our website with astronomical images sent by public and published on our social networks during the pandemic. In addition, we took advantage of part of these photographs to produce scientific dissemination content, such as texts, videos, images, teaching materials and lives broadcasts with tips on how to observe certain astronomical events directly from the audience windows, creating a direct interaction channel with the public (Freire 2021). The project also seeks to discuss and make the population aware of the problem of light pollution by creating the *#DesligueasLuzes* (“Turn off the Lights”) in Portuguese movement.

The Astronomy Through the Window project consists of several actions, all focused on the dissemination of Astronomy and interactivity with the public, reducing the distance between the population and the academy. The focal activities of the project are:

2.1. Monthly YouTube live *Tips for observing the Night Sky*

We promote a monthly YouTube live on TV Valongo channel, with astronomical observation tips for each month along with photography tips, so that netizens can observe and capture each sky phenomenon in the best possible way. Our lives have the participation of astronomers from the Valongo Observatory and UFRJ undergrads interacting synchronously with viewers through the platform’s chat box. In addition, we selected and disseminated some astrophotographs sent by the public during the month to explain certain phenomena, concepts, and astronomical objects. An example can be seen at (TV Valongo 2022). Figure 1 shows a thumbnail image of August 2022 live, used as background during video and promotional.

2.2. Featured Ephemerides

ATW also regularly publishes the Astronomical Ephemerides on project’s social networks, so the public can observe and register these events. They are divided into three different levels of observation, *Easy*, *Medium*, and *Hard*. *Easy* is the set of phenomena that can be observed with the naked eye without much difficulty. *Medium*, those that can be observed with the naked eye, but depend on a location where there is low light pollution. And, finally, the *Hard* level includes those conditions that need the aid of telescopes or binoculars for satisfactory observation.



FIGURE 2. A mosaic made with astrophotographies sent by ATW contributors.

2.3. Photo Gallery

The photo gallery is available on the Valongo Observatory official website and is updated with astrophotographs published on our social networks, which are sent by the public. All images received are published and disseminated in our gallery, with their respective credits, regardless of photographic quality and merit, and with an accompanying info describing on the object or phenomena observed, besides commentaries on underlying portrayed art and skyscapes. A sample of received images can be seen in figure 2.

2.4. Month Objects

Besides our monthly YouTube lives, we also promote a monthly interactive poll on Twitter, where we select four astronomical objects and open a poll so that the public can choose which is their favorite. At the end of voting, a series of informative publications are prepared about the winning object, containing texts, images and trivia.

2.5. Annual Ephemerides Calendar

The ATW team is also responsible for preparing the annual astronomical calendar for the Valongo Observatory at UFRJ. It is a publication about the main astronomical phenomena that will happen during the year, being divided by month, giving the details of day, time, and region so that these events can be observed easily. In addition, part of the images displayed in the calendar are selected from our photo gallery. The calendar is one of the free materials available for download on the Valongo Observatory’s official website (URL: <https://ov.ufrj.br/>). The cover of the last one, made for this year, can be seen in figure 3.



FIGURE 3. 2022 Ephemerides Calendar cover.

3. Results and Conclusions

The project is a success thanks to its interactivity, gathering, in these two years of existence, more than 400 photos sent by more than 200 participants from almost all Brazilian states, with a few submissions from other countries as well, which can be seen in figure 4. For the first time, an outreach activity by Valongo Observatory had such a wide reach, well beyond Rio de Janeiro state. All images received are analyzed and subsequently used to feed back the ATW's astronomy dissemination activities, enriching the material produced by the team. With this exchange of knowledge and interactive experiences, we managed to reduce the distance between academy and society, one of the main objectives of outreach projects. Success can be seen in the growing volume of collaborations and engagement, as well as the positive feedback sent by the public.

Due to its interdisciplinary nature (Jafelice 2010), ATW exists through the cooperation of undergraduate students from different courses at UFRJ, as well as independent collaborators, who have been working since its foundation. The team acts on the front line of interaction with the public, being involved in activities such as content production, posting and moderation on the various social medium of the Valongo Observatory, and acts in the technical backstage of live broadcasts too.

In 2021, ATW became part of the UFRJ Outreach Program *Letramento Científico – O Céu é o Limite (Scientific Literacy – The Sky is the Limit* in Portuguese), which encompasses the UFRJ Institute of Physics and the Valongo Observatory, in an effort to stimulate interest in science among young people and, in parallel, discuss the role of science in current times.

Since then, the project has been broadening its horizons and collaborating with other outreach projects, such as, for example, *Astros a Serviço das Ciências (Astros in Service of Sciences* in Portuguese), whose result was the 1st Poetry Contest of the Valongo Observatory, carried out as a commemoration activity for the International Observe the Moon Night, promoted by NASA. The contest was aimed at elementary and high school students and received poems from all over Brazil. The videos

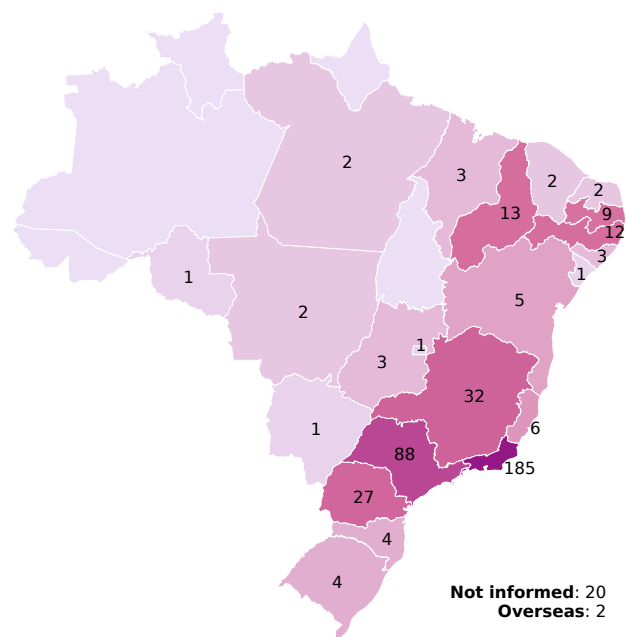


FIGURE 4. The number of photos taken in each Brazilian state up to September 2022. More than 400 photographs posted on social media by more than 200 participants.

promoting the winning poems use photos from the image gallery received by ATW. Other collaborations yielded lives and podcasts. The project aims to continue the current activities together with the in-person return of the observations open to the public at the Observatory and the other in-person outreach activities.

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