

## INTRODUCTION

"Closer to the Sky" is a project born at the PPG community (short for Pavão-Pavãozinho-Cantagalo), as the result of the collaboration between the PPG astronomical club, researchers and students from the Valongo Observatory at UFRJ, artists, educators, and community residents.

The primary objective of the project is to leverage the appeal of astronomy as a means of generating curiosity and interest in science among children, while also encouraging the learning of English as a second language and cultivating a non-violent mindset. The project seeks to do so from a decolonial perspective, aiming to create a framework that fosters curiosity and encourages exploration while also challenging colonialist assumptions and biases.



## THE PROJECT



"Closer to the Sky" combines several key components: (i) the teaching of astronomy and English; (ii) research into education in vulnerable contexts, including the development of new literacies for children from favelas and suburbs; and (iii) outreach activities that include stargazing and the creation of artistic materials inspired by astronomy, in collaboration with local artists.

## SCIENCE AND ART

Through dialogue with artists, scientists are encouraged to combine their analytical expertise with accessibility, learning to present their discoveries in a way that is more relatable and less encumbered by academic jargon and complex data. Artists offer valuable insight and creative responses that can serve as a "translation" of opaque physical and astronomical concepts for a broader audience. Additionally, art can serve as a means of engaging individuals in the creation of astronomy-inspired works and drawings, leading to a deeper understanding of complex subjects through a process known as "embodiment". This concept recognizes that thinking is not solely a mental process, but rather a combination of material and ideational components, including speech, sensory imagination, gestures, tactility, and actual interactions with signs and cultural artifacts.



## TIMELINE

### The first edition

The PPG astronomical club started in 2020 in collaboration with the South Hampstead High School in London, UK, and held weekly classes that connected students from London and PPG. Due to the lack of proper internet access in most favelas and suburbs [1], the pandemic resulted in almost two years of teaching absence, which couldn't be overcome. Nevertheless, this first edition of the project paved the way for a new modality of teaching within the periphery. The project ended with the return of in-person classes and was included in the study "Challenges, Strategies, and Impacts of Doing Citizen Science with Marginalized Communities: Aiming for a Kit That Can Be Applied in All Contexts," led by Dra. Petra Benyei (ICTA-UAB, Barcelona), which was accepted for publication in the journal *Citizen Science: Theory and Practice*.

### The project today

In 2022, the PPG astronomical club joined the social cause "Ninho das Águias" (Eagle's Nest), which has been operating in a specific territory inside the PPG favela called Vietnã since 2011 and the project Closer to the Sky was born!

Ninho das Águias was founded by two residents of the favela who have transformed a dumping ground into a public library that promotes access to PPG through art, literature, and various actions. Currently, the project teaches children ages 3 to 13 in face-to-face classes held in the library.



### The future of the project

In 2023, "Closer to the Sky" began as a collaboration with the AstroTribe project of AstroNera, an e-learning platform for astronomy. AstroTribe's main goal is to teach astronomy to children in social vulnerability in Pune, India, by training young students aged 14 to 19 to become astro-guides. Through this collaboration, "Closer to the Sky" will start classes for older students and aim to train astro-guides in PPG. It will also focus on the study of English as a foreign language and facilitate the exchange of knowledge between children from these two different realities. The IAU-OAD is assisting this collaboration.

## METHODS

The project's core philosophy centers around active methodologies that empower and foster autonomy among its participants.

Drawing on the ideas of Brazilian philosopher Paulo Freire, "Closer to the Sky" aims to promote a dialogic education that fosters communication between teachers and students, as well as a liberating pedagogy that encourages critical thinking about the oppressive realities faced by many individuals [2]. To achieve these goals, the project adopts the pedagogy developed by Professor Marcelo Arouca, which applies Freire's methodology within the context of favelas [3].

Furthermore, the aim of the "Closer to the Sky" project is to recognize the inherent value of each child as an individual thinker, with a focus on fostering their ability to develop an autonomous personality. In pursuit of this goal, the project draws inspiration from the Montessori method by designing classes that involve physics and astronomy experiments and activities to encourage children's curiosity and exploration [4]. Although a physical Montessori structure is currently unavailable, the project is motivated by its philosophy and has adapted techniques to promote children's independence, using methods that are feasible within the constraints of the project's current resources, such as providing books at accessible heights for children to reach.

## RESULTS AND CONCLUSION

In conclusion, the "Closer to the Sky" project has demonstrated the power of astronomy and art as tools to promote education and engagement among children from marginalized communities in Rio de Janeiro. Through a collaborative effort between researchers, educators, artists, and residents of the Pavão-Pavãozinho-Cantagalo favela, the project has been able to teach astronomy and English, conduct research on education in fragile contexts, and organize outreach activities such as stargazing and the creation of art inspired by astronomy.

By incorporating the Montessori method and the pedagogy of Paulo Freire, the project aims to empower children to think critically and develop their autonomy. The success of the project has led to collaborations with other initiatives, such as AstroTribe in India, and its impact is visible in the strengthening of communication channels between the public and the university. Overall, "Closer to the Sky" represents a valuable example of co-creating knowledge and promoting social inclusion through the use of innovative educational methodologies.

### References:

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