

## Planetariums of the south

### A traveling exhibition on the centuries-old relationship between the gaúcho people, astronomy, and astronautics

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**Abstract.** Situated in southernmost Brazil, Rio Grande do Sul boasts a rich ethnic composition and is home to diverse ecosystems from the Atlantic Forest and the Pampa. However, the state's scientific contributions, as well as its historical and cultural diversity, still lack broader recognition. This study gives rise to a virtual exhibition that documents and analyzes these contributions, highlighting the role of local institutions and individuals in research, education, and scientific outreach. The online exhibition will serve as the foundation for the creation of an Interactive, Itinerant, and Inclusive Exhibition, aimed at engaging the public through audiovisual and interactive experiences combined with planetarium sessions. In parallel, the Cyber-exhibition "The Centuries-Old Connection Between the Gaúcho People, Astronomy, and Astronautics" emphasizes the historical and scientific ties of Rio Grande do Sul and seeks to present the scientific and technological advancements driving space exploration. Additionally, it explores the intersections of race and gender within this context, promoting scientific literacy and technological engagement while integrating them with historical and social processes.

**Resumo.** Situado no extremo sul do Brasil, o Rio Grande do Sul possui uma rica composição étnica e abriga ecossistemas diversos da Mata Atlântica e do Pampa. No entanto, as contribuições científicas do estado, bem como sua diversidade histórico-cultural, ainda carecem de maior reconhecimento. Este estudo dá origem a uma exposição virtual, que documenta e analisa essas contribuições, destacando o papel de instituições e indivíduos locais na pesquisa, na educação e na divulgação científica. A exposição online servirá de base para a criação de uma Exposição Itinerante, Interativa e Inclusiva, cujo propósito é engajar o público por meio de experiências audiovisuais e interativas associadas a sessões de planetário. Paralelamente, a Ciberexposição "A Secular Conexão Entre os Povos Gaúchos, a Astronomia e a Astronáutica" enfatiza as relações históricas e científicas do Rio Grande do Sul e busca apresentar o desenvolvimento científico e tecnológico que impulsiona a exploração espacial. Além disso, discute as intersecções de raça e gênero nesse contexto, promovendo a alfabetização científica e o engajamento tecnológico, sem dissociá-los dos processos históricos e sociais.

**Keywords.** Science outreach

#### 1. Introduction

This work presents an initiative developed within the framework of the "Planetários do Sul" network, which fosters collaboration among Higher Education Institutions (HEIs) in Rio Grande do Sul (RS) to strengthen scientific outreach and enhance science education through planetariums and astronomy-related activities. Additionally, research efforts explore young people's perceptions of science and assess the impact of their engagement in planetarium experiences.

The Céus do Sul Cyber-Exhibition<sup>1</sup> is part of the project "The Centuries-Old Relationship Between the Gaúcho People, Astronomy, and Astronautics", funded through the CNPq/MCTI/FNDCT Call No. 36/2022 - From Science Parks to Space Exploration, Astronomy, and Astronautics: Itinerant Exhibitions, Science Popularization, and Decentralization.

This project highlights Rio Grande do Sul's cultural and scientific diversity. This region is shaped by Indigenous, African, and European heritage and marked by significant ecological richness. However, many of these contributions remain insufficiently acknowledged, even within the local community.

The initiative critically examines the role of astronomy and astronautics in the state, emphasizing the contributions of educational, research, and outreach institutions and their influence on scientific progress at local, national, and global scales. By adopting an engaging and inclusive approach, the project seeks

to ignite public interest in science and technology, foster social inclusion, and inspire future generations of scientists and innovators.

#### 2. Integrating Knowledge: Science, Culture, and Youth

The project is rooted in the concept of "ecology of knowledge", as proposed by Santos & Meneses (2010), which promotes an equitable dialogue between diverse knowledge systems, bridging traditional and scientific perspectives. This approach values cultural and epistemological plurality, particularly highlighting the knowledge systems of Indigenous peoples, Afro-Brazilians, and Gaúchos<sup>2</sup>.

Furthermore, the initiative aims to enhance science communication and accessibility, placing social inclusion at the core of a new narrative for youth engagement in science. Studies reveal that while Brazilian youth express interest in science and technology, their awareness of local scientists and research institutions remains limited. This underscores the critical need for initiatives that inspire youth to pursue scientific careers and strengthen their connection with the scientific community.

#### 3. Methodology

The exhibition is structured as a network of interconnected "nodes," exploring various media and forms of expression with

<sup>1</sup> <http://www.ufrgs.br/ceusdosul>

<sup>2</sup> <https://www.ufrgs.br/museu/12000-anos/>

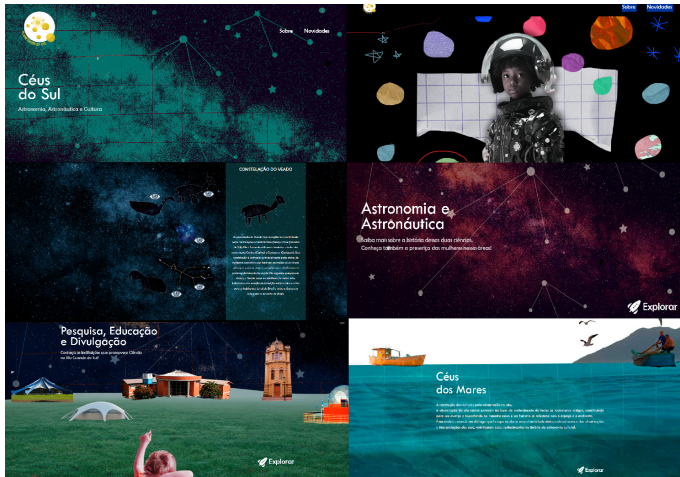


FIGURE 1. Composite image of screenshots from the cyber-exhibition website.

a strong emphasis on inclusivity (Fig1). Initially conceived as a virtual exhibition, it will later be adapted into a physical format, traveling alongside the fixed and mobile planetariums of Rio Grande do Sul (RS).

The exhibition's narrative is divided into five key thematic nodes:

- Skies of the Pampa – Explore the constellations identified by the ancient peoples of the Pampa region and their unique interpretations of the sky.
- Astronomy and Astronautics – Trace the history and evolution of these two scientific fields, with special attention to the significant contributions of women in Astronomy and Astronautics.
- Stardust Made Us – Explore the cosmic calendar, a concept introduced by Carl Sagan that condenses the universe's history into a single 365-day year. This version also incorporates the history of settlement and cultural development in Gaúcho territory.
- Research, Education, and Outreach – Learn about the institutions driving scientific progress in Rio Grande do Sul, promoting education, research, and public engagement.
- Skies of the Seas – Showcasing the outreach initiatives led by the Natural Sciences Museum of UFRGS (Federal University of Rio Grande do Sul) in disseminating scientific knowledge.

The exhibition's content was developed with the support of a network of scholarship recipients from participating institutions. All materials were collected, curated, and systematically organized in a shared digital repository, ensuring accessibility and fostering collaborative engagement.

#### 4. Discussion

This initiative's inclusive and interactive approach aims to spark public interest in Astronomy and Astronautics, fostering deeper engagement with scientific knowledge and technological skills among students and the broader community.

Accessibility and inclusion are core pillars of the project, achieved through tactile and audiovisual resources that facilitate active participation for individuals with disabilities and diverse learning styles.

Expected outcomes include strengthening education and research networks in Rio Grande do Sul, improving teacher training, and creating new platforms for science dialogue. Moreover,

the exhibition has the potential to inspire new scientific vocations, especially within marginalized communities, fostering a more equitable and diverse scientific landscape.

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#### References

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