







## UPDATING THE GEOLOGICAL EXHIBITION AT THE MUSEU EDUCATIVO GAMA D'EÇA, SANTA MARIA, RIO GRANDE DO SUL, BRAZIL

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**Abstract:** *The Gama d'Eça Educational Museum is affiliated with the Universidade Federal de Santa Maria (UFSM) and is housed in a historic mansion located in the city center of Santa Maria. Its strategic location and active programming make it a key space for fostering interaction between the university and the broader community. Among the museum's public engagement strategies is the periodic renewal of long-term exhibitions, particularly those related to applied sciences and everyday life. The year 2025 marks a special occasion for UFSM: the 60th anniversary of its Geography undergraduate courses, which are housed within the Department of Geosciences. This department also maintains the university's lithotheque, which has partnered with the Gama d'Eça Museum to carry out a revitalization of its mineral and rock exhibition. Scheduled to launch in the second half of 2025, the renewed exhibition will showcase examples of geodiversity through the themes of ferrous metallic ores, non-ferrous metallic ores, non-metallic (or industrial) ores, energy resources, ornamental rocks, and gemstones. The exhibition is expected to attract approximately 8,000 visitors by the end of 2025 and aims to inspire similar ex situ geoconservation initiatives in other institutions.*

**Keywords:** *Applied mineralogy; Geoconservation ex situ; Mineral geoheritage; Geology collection; Expographic petrology*

## 1. INTRODUCTION

The concept of a museum has evolved significantly over time and varies according to the theoretical framework adopted (Brown & Mairesse, 2018). Nevertheless, a global widely accepted definition is that provided by the International Council of Museums (ICOM, 2010), which characterizes museums as permanent institutions, open to the public, possibly non-profit, and dedicated to the preservation, research, and communication of the tangible and intangible heritage of humanity and the natural sciences, with the aim of contributing to education, study, and leisure in society.

The Museu Educativo Gama d'Eça, located in Santa Maria, Rio Grande do Sul state, in Brazil, stands out as a space dedicated to education, research, and leisure. The institution was established in 1981 through the merger of the Victor Bersani Museum and the Gama d'Eça Museum, both affiliated with the Universidade Federal de Santa Maria (UFSM) (Gaklik & Saad, 2013). The museum has become a reference collection in central Rio Grande do Sul, housing assemblages from various fields of knowledge. Among its preserved collections, the mineral and rock assemblage are particularly noteworthy.

In 2025, UFSM celebrates the 60th anniversary of its undergraduate (Bachelor's and Teacher Training) programs in Geography. Among the commemorative activities is the preparation of an applied mineralogy and petrology exhibition featuring part of the collection of the Department of Geosciences at UFSM, in addition to the mineral and rock collection of the Gama d'Eça Museum itself. This initiative aims to enhance the value of ex-situ geological heritage by promoting its dissemination and engaging the public in the historical and contemporary uses of rocks and minerals in everyday life. The exhibition seeks to foster recognition of geodiversity not only in the context of education and scientific research but also in terms of its practical relevance to human activities. The objective of this work is to revisit the historical development of the Gama d'Eça Museum, highlighting its formation and subsequent transformations. Furthermore, the study aims to

present the geological collection currently preserved by the museum and to discuss the planning of the geological materials exhibition developed in celebration of the 60th anniversary of UFSM's Geography undergraduate programs, as a means to support the design of analogous initiatives in other ex-situ geoconservation spaces within universities.

## 2. HISTORY OF THE MUSEU EDUCATIVO GAMA D'EÇA

The Victor Bersani Museum was founded on January 29, 1914, originally under the auspices of the Sociedade União de Previdência Privada (formerly the Sociedade União dos Caixeiros Viajantes). The Museu Educativo Gama d'Eça was established by the UFSM on July 23, 1968, during the administration of Rector José Mariano da Rocha Filho, founder of the university. The museum was named in honor of military officer José Maria da Gama d'Eça, in recognition of his contributions to the city of Santa Maria (Machado & Ribeiro, 2015). Its first location was Room 5106 on the ground floor of the Pedagogical Sciences Center building, now the Center for Education. The exhibition area was later expanded to Rooms 5108 and 5109, allowing the museum to open to the public. However, on February 28, 1979, the museum was relocated to Building 21 on UFSM's main campus. While this move provided more space, it also reduced accessibility for the general public, as the new location was on the second floor of a building situated away from central and more easily accessible parts of the city (Blaya et al., 2017). On December 10, 1981, at the end of Rector Derblay Galvão's term, the Victor Bersani Museum was officially annexed to the Gama d'Eça Educational Museum, and the university received a donation of over 3,500 pieces (Dias Neto, 2024). As the UFSM museum lacked the physical space to house this collection, the Victor Bersani Museum continued operating in its original facilities, with support from staff of the Gama d'Eça Museum.

Today, the Gama d'Eça Educational Museum is housed in a mansion built in 1912 (Figure 1), formerly the residence of Astrogildo César de

Azevedo, a physician of historical importance to the municipality of Santa Maria. After his passing, the property was inherited by his daughter Estela and her husband Miguel Maria Bezeza. As the couple had no descendants, the residence was repurposed by the Santa Maria City Hall in 1963 (Rossi & Witter, 2012). Due to its proximity to the Administration course building, UFSM expressed interest in the site, and, at the request of the university administration, it was granted for shared use in 1964. This arrangement continued until 1984, when the city began relocating its offices. The process was finalized on December 10, 1985, establishing the museum's current headquarters (Seganfredo & Queruz, 2016).



**Figure 1.** Mansion of Astrogildo de Azevedo

As the building was not originally designed for museological purposes, structural adaptations were required. The museum was officially reopened in July 1988 with the exhibition *The Life Path of José Mariano da Rocha Filho*. This reopening also included landscaping of the outdoor area and the unveiling of the city's first private swimming pool, along with features such as a small zoo, a compass rose, and the Garden of Suits (Rocha Duarte, 2014), as can be seen in Figure 2. Since 2023, the museum has been under the direction of museologist Bernardo

Duque de Paula, whose goals include restructuring exhibitions, revitalizing the visitor space, and strengthening UFSM's extension initiatives in downtown Santa Maria.



**Figure 2.** Garden of suits

### 3. GEOLOGICAL COLLECTIONS AND GEOSCIENCE OUTREACH ACTIVITIES AT THE MUSEUM

The geological collection of the Gama d'Eça Museum has been properly cataloged and integrated into the Tainacan digital repository (Martin & Martin, 2020). According to data available on the platform (link: <https://tainacan.ufsm.br/museu-gama-deca/colecoes/>) the collection comprises 456 samples from the Gama d'Eça Collection, 429 from the Victor Bersani Collection, and 29 samples not previously indexed in other sets, totaling 914 specimens. The recorded typologies include igneous, sedimentary, and metamorphic rocks, as well as minerals, soil samples, and sands.

Minerals constitute the majority of the collection, although a wide range of igneous, metamorphic, and sedimentary rocks is also represented. Among the igneous rocks, 64 basalt samples stand out, characterized by their dark color, fine grain, from its volcanic origin. These rocks are abundant in the state of Rio Grande do

Sul, Brazil (Frank et al., 2009; Rossetti et al., 2018). The metamorphic group includes 16 marble samples, mostly from the central region of the state—part of the geomorphological province of the crystalline shield (Siviero & Pulz, 2001)—and 19 schist samples from various parts of Brazil. In the sedimentary category, coal and limestone are the most numerous, with 142 and 82 samples respectively. Coal has historically been an important energy resource in the state (Alves & Ade, 1996; Kalkreuth et al., 2006). Minerals form the most abundant category in the collection, including 129 quartz specimens, 143 samples of chalcedony, and 23 of hematite.

The Gama d'Eça Museum is recognized for its multidisciplinary character, integrating collections from the natural sciences—such as rocks and minerals, taxidermied animals, entomological specimens, and paleontological exhibits—with those from other fields, including archaeology, the history of Rio Grande do Sul and UFSM, and numismatics. These collections serve as important educational tools for interactive activities led by teachers, project coordinators, graduate and undergraduate students, and other members of the UFSM community. As part of the university's outreach programs, they are used to engage students from both public and private

Basic Education schools, as well as the general population of Santa Maria. In addition to receiving scheduled and guided visits, the museum also functions as a space for science communication, hosting public presentations of academic findings, thesis and dissertation defenses, and other university extension activities.

#### 4. GEOLOGICAL COLLECTIONS AND GEOSCIENCE OUTREACH ACTIVITIES AT THE MUSEUM

The museum currently features a display case dedicated to showcasing geological samples. Among the exhibited specimens are 13 types of minerals and rocks, namely: agate, amazonite, slate, calcite, chalcedony, fuchsite, granite, marble, muscovite, quartz, quartzite, and schist, as shown in Figure 3. The selection was guided by aesthetic criteria, prioritizing visual appeal as a strategy to capture visitors' attention and promote awareness of geodiversity. This approach aligns with methodologies for the geoconservation of ex situ geological heritage (Bétard et al., 2023; Nobre et al., 2024; Pimentel et al., 2025).



**Figure 3.** Current geological display at the Gama d'Eça Museum. A: Samples arrangement in the display case. B: Layout designed to attract visitors' attention.

With the aim of expanding and renewing its natural sciences exhibits while strengthening community engagement, the Gama d'Eça Museum has launched new long-term exhibitions in the areas of Paleontology and Archaeology. This revitalization initiative aligns with the Museum's Museological Plan for the 2025–2029 period, which highlighted that regularly updated exhibitions—especially those related to applied sciences and everyday or contemporary themes—tend to generate greater public interest, receive more positive feedback, and foster higher visitor engagement. In response to this demand, a new exhibition of minerals and rocks was planned for a previously unused room within the museum, contributing to the overall revitalization of the space.

Although the museum already holds a significant geological collection, additional samples were required to address the applied science themes of the new exhibition. These were provided by the Department of Geosciences at UFSM, whose collaboration holds special significance in 2025, marking the 60th anniversary of the founding of UFSM's undergraduate and bachelor's degree programs in Geography. The upcoming exhibition is part of a broader series of commemorative initiatives celebrating this milestone. The new display will categorize samples into the following groups:

1. Ferrous metallic ores;
2. Non-ferrous metallic ores;
3. Non-metallic (or industrial) ores;
4. Energy resources;
5. Ornamental rocks; and
6. Gemstones.

Examples of each category are illustrated in Figure 4.

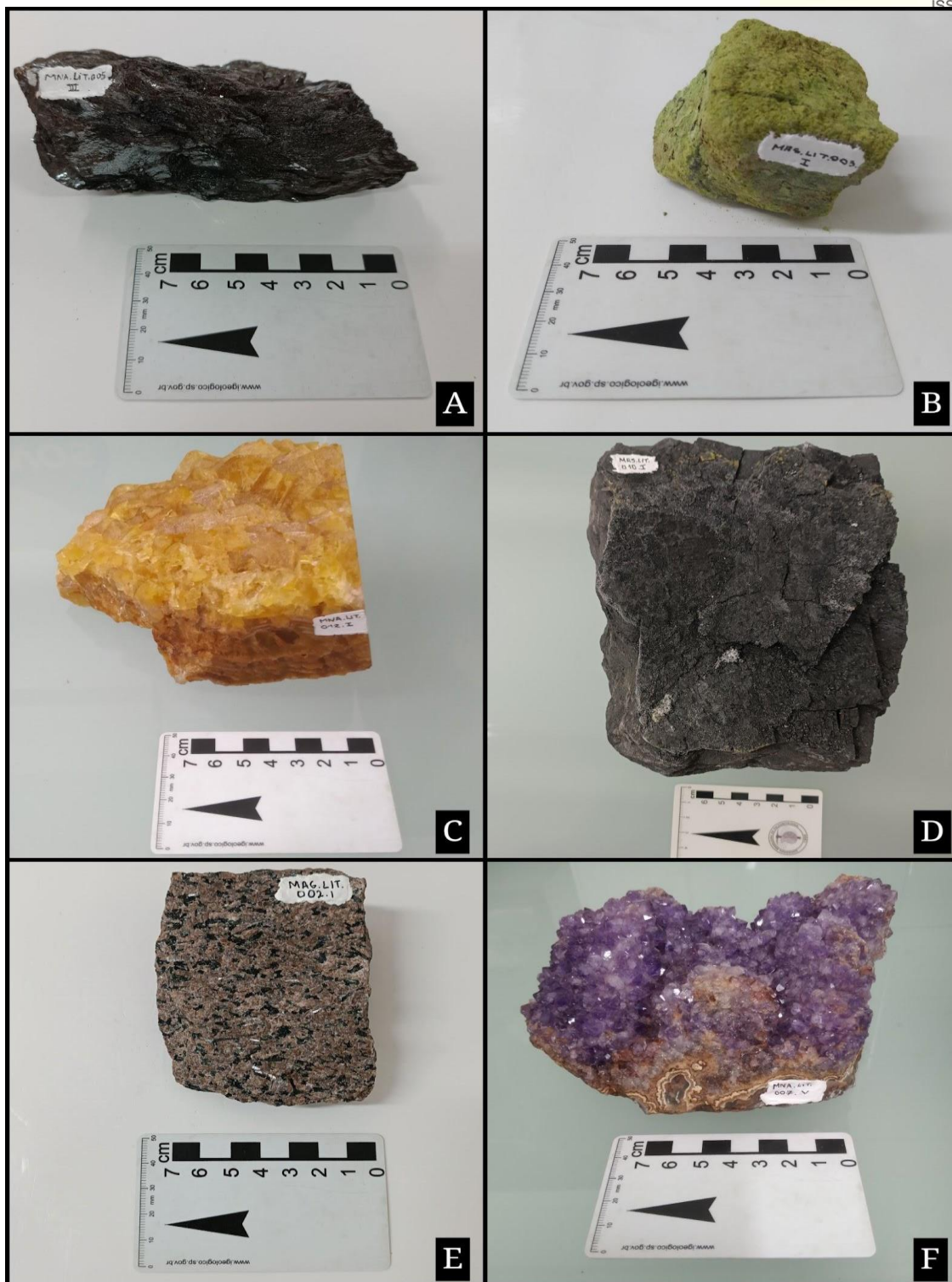
Ferrous metallic ores refer to mineral substances and rocks used in the production of steel and its alloys. Non-ferrous metallic ores are those employed in metallic alloys not necessarily linked to steel production. Non-metallic or Industrial

ores are raw materials used in non-metallurgical sectors of industry. Energy resources include substances used in the generation of electricity. Ornamental rocks comprise natural materials used as cladding and finishing elements in the construction industry, while gemstones refer to aesthetically and economically valuable minerals widely used in jewelry.

The display will adopt a technical-scientific classification based on principles of economic geology, geometalurgy, and industrial applications (Nobre et al., 2021; Nobre et al., 2023). This framework allows for the organization of mineral resources according to their use type and economic value. Given the potential for gradually increasing the exhibition's visibility and public engagement over time, a progressive growth in attendance is anticipated. By the end of the second half of 2025, the number of visitors is projected to reach a total of 8,000. This figure would reflect not only the success of the museum's outreach and science communication strategies but also the potential of exhibition renewal as an effective tool for public engagement.

## 5. EXPECTED RESULTS

The exhibition is expected to open between August and September 2025, with an estimated average of approximately 2,000 visitors per month during its initial period. This projection is based on preliminary estimates that take into account regional interest in the theme, the exhibition's scientific and educational relevance, and anticipated visitor expectations. By the end of the second half of 2025, the number of visitors is projected to reach a total of 8,000. This figure would reflect not only the success of the museum's outreach and science communication strategies but also the potential of exhibition renewal as an effective tool for public engagement.



**Figure 4.** Representative samples by category. A. Hematite, specularite variety, as an iron ore; B. Garnierite and pentlandite in nickel ore; C. Fluorite; D. Coal; E. Piquiri Syenite; F. Amethyst.

## 6. CONCLUSION

Through the revitalization of the geological collections at the Gama d’Eça Educational Museum, the aim is to contextualize the uses and applications of these materials and also present the exhibition as a practical and inspiring example for other institutions—

particularly universities, which often house geological collections with untapped exhibition potential. These often underutilized collections hold significant promise for the development of geoconservation initiatives focused on ex situ geodiversity, as demonstrated by the experience at UFSM. In this context, such samples can be reevaluated

from a cultural perspective, contributing to the dissemination of geological knowledge beyond the academic sphere. This aligns with university outreach efforts, which have gained increasing recognition from Brazil's Ministry of Education, particularly following the institutionalization of extension activities as a mandatory component of higher education curricula (Brasil, 2018).

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