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## Implementation of FAIR Principles in Stained Glass Research, Exemplified by Data on the Works of Caspar Gsell

Karin von Wartburg and Katrin Kaufmann, Vitrocentre Romont

Caspar Gsell, born in St. Gallen in 1814 (†1904 Paris), ran the internationally successful stained glass workshop Gsell-Laurent in Paris in the second half of the 19th century.<sup>1</sup> In view of his early stained glass paintings executed in the 1850s for two churches in Switzerland and a large number of windows for several hundred churches and civil buildings in France, Gsell is considered an influential pioneer of the stained glass revival. His neo-Gothic *Last Supper* window dating from 1853 for the church of Saint Lawrence in St. Gallen is the earliest monumental work of the stained glass revival in Switzerland created by a Swiss artist.<sup>2</sup> In 1856, Gsell was entrusted with another prestigious project in Switzerland and created several ornamental stained glass windows depicting scenes from the life of Christ in medallions for Basel Cathedral.<sup>3</sup> His great talent as a draughtsman is impressively evidenced by three small-format stained glass paintings, which are held in a private collection and show Brazilian landscapes (fig. 1).<sup>4</sup> Gsell probably created these paintings for his brother Jakob Laurenz Gsell (1815–1896), who lived in Rio de Janeiro between 1836 and 1850, where he founded a trading company, and who occasionally provided financial support for his brother in Paris until he had established himself as a glass painter around 1850.

### Documenting Stained Glass Windows

Since 2022, Gsell's oeuvre in Switzerland, France and Belgium has been inventoried and studied by the Vitrocentre Romont. His main works have been examined and documented on site and a data file was created for each stained glass painting in the FileMaker database Vitroinventaire. Each entry contains a range of general information (e.g. title of the work, artist and workshop, date, signatures, inscriptions, details of the location in accor-

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1 Caspar Gsell founded the stained glass workshop Laurent, Gsell & Cie. in 1847 together with the printer and publisher Émile Laurent (1802–1863), whose daughter Adèle Caroline Laurent (1834–1919) he married in 1859. After the death of Émile Laurent, the company operated under the name Gsell-Laurent; see Cabezas 1996.

2 See Evangelisch-reformierte Kirchgemeinde St. Gallen 1979, 137–139; vitrosearch.ch, CG\_63, <<https://vitrosearch.ch/de/objects/2713400>>.

3 See Nagel/von Roda 1998, 40–43, 327–329; vitrosearch.ch, CG\_65–CG\_67, <<https://vitrosearch.ch/de/objects/2713404>>.

4 See vitrosearch.ch, CG\_69–CG\_71, <<https://vitrosearch.ch/de/objects/2713407>>.



Fig. 1. Caspar Gsell, *Bay near Rio de Janeiro*, ca. 1852–1860. Stained glass window, 31 × 45 cm. Private property. Photography by Katrin Kaufmann.

dance with the guidelines of the Corpus Vitrearum International<sup>5)</sup> enhanced by an iconographic description of the window and an account of the history of its creation, which includes contextual information from secondary sources and sheds light on the context in which the window was created. Additional research was carried out in archives: information from primary sources studied on site has been incorporated in the entry on the history of a large-format window in the church of Saint Godard in Rouen (fig. 2) dating from 1866/67, for example.<sup>6</sup> The five-lancet tracery window shows a complex iconographic program dedicated to the Virgin Mary and the dogma of her Immaculate Conception with three registers of superimposed scenes. The main scene in the lower section depicts a recent event, the proclamation of the dogma by Pope Pius IX on December 8, 1854, in Rome. The other sections are dedicated to figures and events relevant to the dogma. Correspondence between Gsell and his contact in Rouen, a priest by the name of Lanchon, reveals that it was the artist himself who invented the visual program.<sup>7</sup> As the window was exhibited at the 1867 *Exposition Universelle* in Paris before it was installed in Rouen, some additional comments on the window can be found in contemporary publications.<sup>8</sup> During the Second World War, the window was severely damaged. After a time in storage, restoration work was

5 See Corpus Vitrearum Guidelines 2016.

6 See vitrosearch.ch, CG\_172, <<https://vitrosearch.ch/de/objects/2713509>>.

7 Diocesan archives of Rouen: Archives of the parish of Saint-Godard of Rouen, 3P4, letter by Caspar Gsell to Pierre Lanchon, October 8, 1866.

8 See Mesnard 1867, 16–18; Didron 1868, 28.

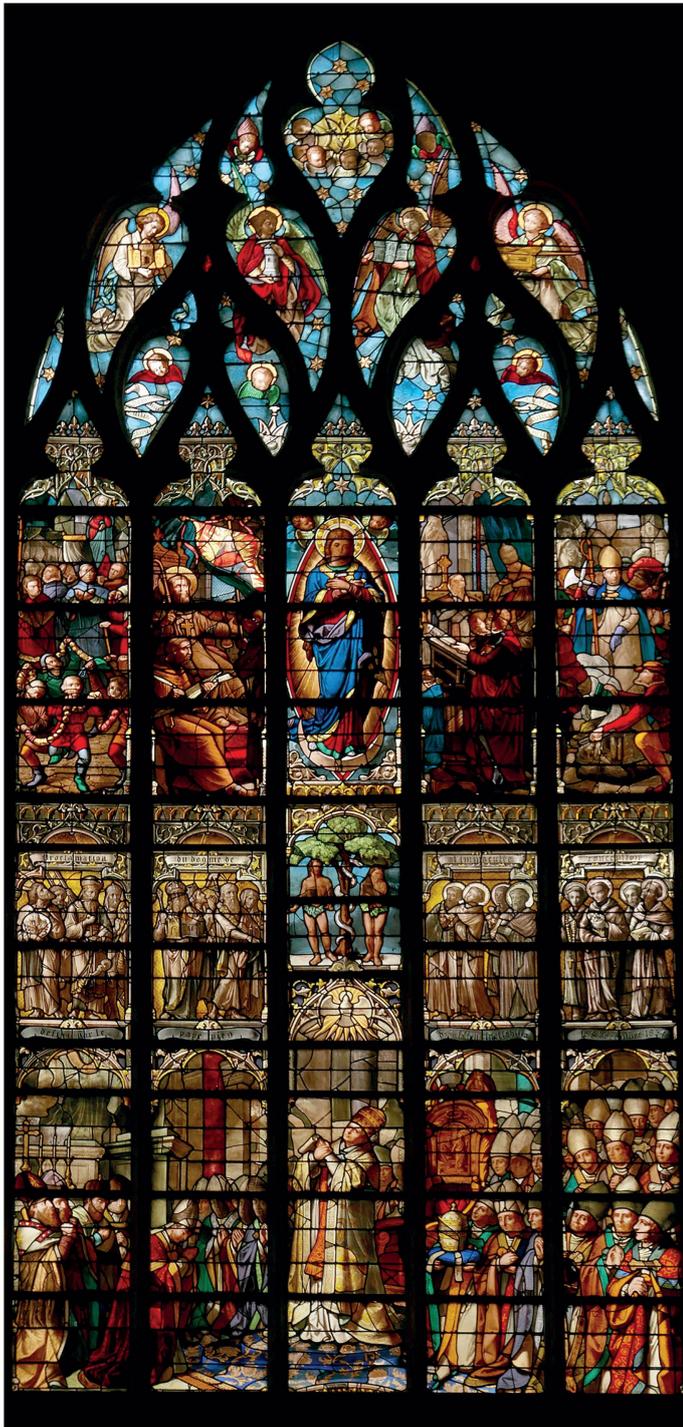


Fig. 2. Rouen, Church of Saint Godard, *Immaculate Conception of Mary*, Caspar Gsell, 1866/67. Photography by Katrin Kaufmann.

Fig. 3. Caspar Gsell, *Sketch for a stained glass window in the church of Saint Godard in Rouen (Virgin Mary and the dogma of her Immaculate Conception)*, ca. 1866. Pencil and watercolor on paper, 42.8 × 19.3 cm. Paris, Musée Carnavalet, D.14638(177). CC0 Paris Musées / Musée Carnavalet – Histoire de Paris.

carried out by Michel Durand (1950–2006) starting in the 1980s and the window was returned to the church. Because apparently Durand was not aware of all the details of the original design, the restored window differs slightly from the original. As certain inscriptions are missing, some scenes are difficult to understand. Today, however, based on the letters preserved in the diocesan archives of Rouen, a reproduction of the window dating from 1867<sup>9</sup> and a sketch in the Musée Carnavalet in Paris<sup>10</sup> (fig. 3), it is possible to reconstruct the original concept and meaning of the window.

## Accessibility of Research Data and FAIR Principles

The results of the Vitrocentre Romont's research will be disseminated in multiple formats: as a printed book, a freely accessible e-book,<sup>11</sup> and a digital inventory of approximately 500 stained glass works via vitrosearch.ch.<sup>12</sup>

Vitrosearch, an open-access platform, was initiated by the Vitrocentre Romont and the Vitromusée Romont and officially launched in 2017. The platform was developed jointly by the Vitrocentre Romont, which now oversees its maintenance and further development, and the Swiss National Data and Service Center for the Humanities (DaSCH), which ensures the long-term storage of the data. The primary goal of Vitrosearch is to provide unrestricted access to the Vitrocentre Romont's research findings for the academic community as well as a wider audience. The platform is meant to highlight the richness and diversity of glass art primarily from and within Switzerland. It is continuously updated and expanded with entries on newly researched works of glass art, so that its continued relevance and comprehensiveness are ensured. In addition to documenting individual works of art, Vitrosearch also provides information about the artists, studios, and buildings associated with these objects, as well as their provenance. Beyond stained glass, the catalogued works include graphic works (e.g. designs), photographs, glassware, and three-dimensional glass. The web platform currently holds research data on a total of 6415 objects, showcasing the full spectrum of glass art, from the early Middle Ages to contemporary creations. Moreover, the platform includes approximately 730 records on buildings, 470 on artists, and 110 on studios. These data entries are interconnected with around 7400 images, the majority of which depict objects, while a smaller number feature general views of buildings.

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<sup>9</sup> See Mesnard 1867, 17.

<sup>10</sup> See Musée Carnavalet, D.14638(177). More than 800 drawings from the workshop Gsell-Laurent, which were donated to the Musée Carnavalet, can be accessed digitally on the Paris museums' online platform <[www.parismuseescollections.paris.fr](http://www.parismuseescollections.paris.fr)>. They are an important source for research on Gsell.

<sup>11</sup> The book will be published in the series *Arts du verre / Glass Art / Glaskunst* by Vitrocentre Romont, see <<https://www.degruyter.com/serial/vitro-b/html>>.

<sup>12</sup> See <<https://www.vitrosearch.ch/de/search?inventory=CG>>.

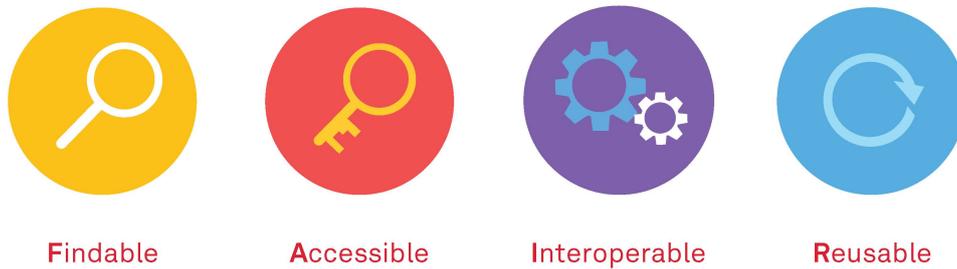


Fig. 4. The FAIR-principles.  
Paulina Halina  
Sieminska / CC  
BY SA 4.0

In accordance with the requirements of the Swiss National Science Foundation,<sup>13</sup> the Vitrocentre Romont, in all its endeavours, including vitro-search, follows the principles of Open Science. The research data produced complies with the FAIR principles – Findable, Accessible, Interoperable, and Reusable<sup>14</sup> – ensuring that it is freely accessible and well suited for use by both individuals and machines (fig. 4). The first two FAIR principles emphasize that data should be findable and accessible. This means that metadata and data must be easy to locate for both humans and computers. A key challenge is ensuring that data can be reliably cited, with stable links that remain valid. DaSCH, as stated above, ensures the long-term storage of the research data and fulfils the requirements for long-term findability and accessibility by assigning a persistent identifier to each dataset. In addition to the importance of ensuring the long-term accessibility of the data, the FAIR principles also highlight the importance of interoperability and reusability. In the field of stained glass art research, the guidelines issued by the Corpus Vitrearum International have played a key role in ensuring the consistent presentation of the printed volumes produced within its projects. Building on these foundational directives, the *Recommendations for the Digital Resources of the Corpus Vitrearum International*,<sup>15</sup> published by the Digital Unit of the Corpus Vitrearum International in March 2024, sets standards for the digital publication of research data in the field of stained glass art. These standards ensure that the level of uniformity achieved in the printed volumes can be maintained in online formats.

Beyond adhering to the principles outlined in the *Recommendations*, the Vitrocentre Romont has made significant strides in improving Vitro-search by aligning its data with the Lightweight Information Describing Objects (LIDO) metadata schema.<sup>16</sup> LIDO is a widely used standard for describing museum and cultural heritage objects, adopted by numerous institutions in German-speaking countries to support the exchange and aggregation of metadata. This alignment ensures compatibility with other accepted standards, including CIDOC-CRM<sup>17</sup>, and thus facilitates the inte-

<sup>13</sup> See Swissuniversities/Swiss National Science Foundation 2024.

<sup>14</sup> See Wilkinson et al. 2016. For a guide on implementing the FAIR principles for cultural studies research data, see Kailus 2023.

<sup>15</sup> Steller et al. 2024.

<sup>16</sup> See ICOM-CIDOC LIDO Working Group 2021.

<sup>17</sup> See <<https://cidoc-crm.org>>.

gration of datasets from various sources. Furthermore, by applying controlled vocabularies such as the Gemeinsame Normdatei (GND)<sup>18</sup>, Virtual International Authority File (VIAF)<sup>19</sup>, Iconclass<sup>20</sup>, Getty Art & Architecture Thesaurus (AAT)<sup>21</sup>, or Wikidata<sup>22</sup>, consistency within Vitrosearch itself is ensured by the use of controlled vocabularies. This approach also enhances the interoperability and linkability of Vitrosearch data with other databases in the GLAM (Galleries, Libraries, Archives, and Museums) sector. As another measure to improve the structure of the data, the granularity of information in Vitrosearch has been enhanced. For instance, donors, families, or heraldic symbols are now represented as separate entities that can be interlinked with the artworks they sponsored or influenced. This level of detail facilitates a deeper exploration of historical and artistic contexts.

## Linking and Reusability of Data

The use of controlled vocabularies and external references increases the visibility and utility of Vitrosearch. Tools such as Metagrid<sup>23</sup> facilitate connections between entities in various scholarly databases, guiding users to further information available on other platforms within the GLAM sector, such as the Historical Dictionary of Switzerland. Linkability and interoperability of Vitrosearch are also aided by the use of the Iconclass classification<sup>24</sup> for the iconographic description, which enables cross-references with the German Corpus Vitrearum image archive. Additionally, explicit references to related objects, such as a stained glass sketch located in the Musée Carnavalet, Paris (fig. 3), assist users of Vitrosearch in finding relevant documents in external databases. The Vitrocentre Romont's data model also supports applications such as data visualization tools. By integrating geolocation data with iconographic metadata, for example, researchers can create interactive maps that trace the distribution of Gsell's stained glass windows across France, Belgium and Switzerland (fig. 5).<sup>25</sup> Such tools can enhance academic research while also drawing the attention of broader audiences to cultural heritage. To improve the reusability of the data, the Vitrocentre Romont ensures that datasets are well-documented, providing details on the context of data production, authorship, and licensing terms.

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18 For more information on the Gemeinsame Normdatei (GND), see <[https://gnd.network/Webs/gnd/EN/Home/home\\_node.html](https://gnd.network/Webs/gnd/EN/Home/home_node.html)>.

19 For more information on the Virtual International Authority File (VIAF), see <<https://www.oclc.org/en/viaf.html>>.

20 For more information on Iconclass, see <<https://iconclass.org>>.

21 For more information on the Getty Art & Architecture Thesaurus, see <<https://www.getty.edu/research/tools/vocabularies/aat>>.

22 For more information on Wikidata, see <[https://www.wikidata.org/wiki/Wikidata:Main\\_Page](https://www.wikidata.org/wiki/Wikidata:Main_Page)>.

23 For more information on Metagrid, see <<https://metagrid.ch>>.

24 Compare footnote 20.

25 See the map showing the locations of the objects in Europe, <<https://www.vitrosearch.ch/en/persons/2710975>>.

The screenshot shows the Vitrosearch interface. At the top, the logo 'VITROSEARCH' is displayed. Below it is a search bar with the text 'Volltextsuche' and a search icon. The search results for 'Gsell, Johann Caspar Julius' are shown, including his name, various name variants (Gsell, Jean Gaspard Jules · Gsell, Johann Kaspar Julius), and his life dates (St. Gallen 1.8.1814–4.2.1904 Meudon). A map of Europe is displayed with several orange pins indicating the locations of stained-glass works by Gsell. Below the map, there is a section titled 'Werke dieses Künstlers / dieser Künstlerin' with a 'Filter einblenden' button. A row of ten small images shows various stained-glass windows created by Gsell.

Fig. 5. Geographical distribution of stained-glass by Caspar Gsell visualized using Google Maps.

The improved version of Vitrosearch will incorporate machine-readable licenses that clearly define how the data can be used. This will facilitate the automated reuse of data across various contexts.

### Challenges and Future Directions

The transition to FAIR-compliant data presents significant challenges, such as the resource-intensive task of aligning existing datasets with the LIDO standard and navigating unresolved copyright issues that limit access to some visual materials. Despite these obstacles, the benefits of FAIR principles are clear: On the one hand, the standardization and enhanced accessibility of Vitrosearch data enhance its reusability, thereby facilitating interdisciplinary research. On the other hand, as demonstrated through examples of Caspar Gsell's works, the user experience can be significantly improved through features such as links to additional resources and the use of visualization tools, which assist users in their research and provide deeper insights into the data.

Future advancements, such as the use of artificial intelligence for pattern recognition in iconographic studies, will rely on standardized data. Thus, the structuring of Vitrosearch data represents an investment in ensuring that the data continues to gain relevance and remains valuable for future research projects in the Digital Humanities.

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Katrin Kaufmann, Dr. phil., art historian. After studies in Art History and Slavonic Languages and Literatures at the University of Berne and the Freie Universität Berlin, she earned her doctorate at the Institute of Art History at the University of Zurich with a dissertation on the reception of the Alhambra in Tsarist Russia. Since 2012, she has held positions as a research assistant at the Department of Historic Preservation of the Canton of Berne (2012–2021) and the Vitrocentre Romont (2019–), where she is responsible for research projects on 19th-century stained glass and for mandates in the field of restoration and conservation of stained glass.

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