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Bringing Research Infrastructure to the Public: an outreach case study from the CERN Science Gateway

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Astrophysics and particle physics both rely on large-scale, complex research infrastructures—from space telescopes and observatories to underground detectors and particle accelerators. While both fields explore fundamental questions about the universe, they also share a common challenge in public engagement: how to make highly technical and abstract science accessible, meaningful and interactive.

Recent initiatives, such as integrating a working particle accelerator into a museum, demonstrate how laboratory-based sciences can create direct and engaging experiences for non-specialist audiences. However, successful public engagement with complex scientific instruments requires more than simply displaying the technology (Bain & Ellenbogen, 2002; Molinié & Boudia, 2009; Gauvin, 2016). Interactive storytelling, live demonstrations and clear contextualisation are essential to making research infrastructure accessible and to fostering deeper public involvement (Meyer, 2011; Hampp & Schwan, 2015; Derolez, 2020).

ELISA, a functioning proton accelerator at CERN's Science Gateway, provides a valuable case study of how real scientific instruments can enhance outreach and education. By allowing visitors to witness real-time scientific processes, ELISA fosters engagement through live demonstrations and participatory learning. However, integrating such an instrument into a museum setting presents challenges, including technical constraints and audience engagement strategies.

This presentation reflects on ELISA's implementation while drawing from best practices in outreach and education research. It explores how scientific infrastructures, regardless of discipline, can be integrated to foster greater public participation and appreciation of fundamental and applied sciences. By addressing the challenges and opportunities of integrating research instruments into science communication, this work provides guidance for institutions seeking to include functional scientific infrastructure to create richer and more immersive public engagement experiences.

References

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