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<https://escholarship.org/uc/item/38s0438b>

Author

Borgman, Christine L.

Publication Date

2018-05-02

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The Durability and Fragility of Knowledge Infrastructures: Lessons Learned from Astronomy [1]

Christine L. Borgman
Distinguished Professor & Presidential Chair in Information Studies
Director, [Center for Knowledge Infrastructures](#)
University of California, Los Angeles
Christine.Borgman@ucla.edu
<http://www.christineborgman.info>

Lund Observatory, Sweden, Wednesday 2 May 2018

Infrastructures are not inherently durable or fragile, yet all are fragile over the long term. Durability requires care and maintenance of individual components and the links between them. Astronomy is an ideal domain in which to study knowledge infrastructures, due to its long history, transparency, and accumulation of observational data over a period of centuries. This talk draws upon a long-term study of scientific data practices to ask questions about the durability and fragility of infrastructures for data in astronomy. Methods include interviews, ethnography, and document analysis. As astronomy has become a digital science, the community has invested in shared instruments, data standards, digital archives, metadata and discovery services, and other relatively durable infrastructure components. Several features of data practices in astronomy contribute to the fragility of that infrastructure. These include different archiving practices between ground- and space-based missions, between sky surveys and investigator-led projects, and between observational and simulated data. Infrastructure components are tightly coupled, based on international agreements. However, the durability of these infrastructures relies on much invisible work – cataloging, metadata, and other labor conducted by information professionals. Our research in astronomy seeks general lessons for science in the stewardship of data and the sustainability of knowledge infrastructures.

[Christine L. Borgman](#), Distinguished Professor and Presidential Chair in Information Studies at UCLA, is the author of more than 250 [publications](#) in information studies, computer science, and communication. These include three books from MIT Press: [Big Data, Little Data, No Data: Scholarship in the Networked World](#) (2015), winner of the 2015 American Publishers Award for Professional and Scholarly Excellence ([PROSE Award](#)) in Computing and Information Sciences; [Scholarship in the Digital Age: Information, Infrastructure, and the Internet](#) (2007); and [From Gutenberg to the Global Information Infrastructure: Access to Information in a Networked World](#) (2000). The latter two books won the [Best Information Science Book of the Year](#) award from the [Association for Information Science and Technology](#) (ASIST). She is a Fellow of the [American Association for the Advancement of Science](#) and of the [Association for Computing Machinery](#).

1. Christine L. Borgman, Peter T. Darch, Ashley E. Sands, and Milena S. Golshan. 2016. The durability and fragility of knowledge infrastructures: Lessons learned from astronomy. In *Proceedings of the Association for Information Science and Technology*, 1–10. Retrieved from <http://dx.doi.org/10.1002/pra2.2016.14505301057>