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Geoluminate: A community-centric framework for the creation, deployment and ongoing development of decentralized geoscience data portals

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An increasing pressure from governing bodies and funding agencies to disseminate research data in an open and FAIR (Findable, Accessible, Interoperable, and Reusable) format has led to an increase in online research portals of varying quality. The task of constructing and maintaining such portals is challenging, especially when left to individuals with limited understanding of modern web architecture. For those starting out on this endeavour, an over-abundance of online advice, coupled with the rapid evolution of “latest technologies”, can be overwhelming. The inevitable uncertainty leads to technologically-isolated portals with limited interoperability that ultimately hinders the exchange of geoscientific information.

To reduce uncertainty for new initiatives, Geoluminate (https://geoluminate.github.io/geoluminate/) – a new micro web framework – offers a simple but robust platform for the rapid creation and deployment of new geoscience research portals. The framework's simplicity ensures that even those with limited expertise in web development can create and maintain effective portals that exhibit consistency in both design and functionality. Geoluminate aims to foster interoperability, reliability and decentralization of geoscience portals by providing a consistent and stable foundation on which they are built.

Leveraging existing features of the Python-based Django Web Framework, Geoluminate offers a comfortable learning curve for those already familiar with Python programming. On top of the feature-rich ecosystem of Django, Geoluminate offers additional features specifically tailored to the needs of geoscientific research portals. Geoluminate is highly-opinionated and comes “batteries included” so that, as a research community, the focus can remain on designing data models that fit specific community needs and less on tedious implementation details.

Currently backed by the international geothermal community as part of the World Heat Flow Database Project (http://heatflow.world/project), Geoluminate is under active development at the GFZ German Research Centre for Geosciences in Potsdam. Under the guidance of the partner repository GFZ Data Services, all data models are intrinsically tied to existing standards of metadata collection (e.g. Datacite, IGSN, ROR, ORCID) such that data publishing is easily facilitated through established pathways.

Geoluminate champions the principles of open science and collaborative knowledge dissemination. This poster presentation aims to showcase the practical implementation and benefits of Geoluminate in creating geoscience research portals that align with FAIR data principles. By fostering a community-centric approach, Geoluminate contributes to the democratization of data management, enabling researchers to actively shape and enhance the landscape of those same portals they likely utilize in their own research.

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