

Sparrow: a cyberinfrastructure component supporting data management and sharing in geochronology laboratories

D.P. Quinn^{1*}; A.J. Schaen¹; K. Sundell²; G. Gehrels²; S.E. Peters¹; J.I. Ross³; M. Schmitz⁴; B.S. Singer¹

¹University of Wisconsin-Madison, Madison, WI 53706, USA
(*correspondance: daven.quinn@wisc.edu)

²University of Arizona, Tucson, AZ 85719, USA

³New Mexico Bureau of Geology & Mineral Resources,
Socorro NM 87801, USA

⁴Boise State University, Boise ID 83725, USA

Best practices for data accessibility and archiving are a key concern within the geochronology community. Meanwhile, evolving time-integrated digital Earth models must be referenced against robust, global age datasets. Increasingly, laboratory data must be accessible to a broad mosaic of data repositories and consumers; systems are needed to manage these integrations and automate data archiving.

Sparrow, a new open-source software component funded by NSF EarthCube [1], provides a standard access layer for measurements produced by individual geochronology laboratories. The system can be deployed atop current, lab-specific systems and workflows for data collection, reduction, and storage. The application programming interface (API) provided by *Sparrow* can be accessed by end users [e.g. 2, 3] and centralized archives [e.g. 4].

Sparrow also includes an extensible, web-based management overlay that streamlines laboratory metadata management tasks such as controlling embargos, identifying and linking geologic and publication metadata, and generating aggregate summaries. The software straightforwardly implements FAIR (*findable, accessible, interoperable, reusable*) data management principles [5] for host labs; it is built to be lightweight, flexible, and standards-compliant.

Sparrow is now being deployed atop several distinct data-reduction pipelines at laboratories specializing in U-Pb, ⁴⁰Ar/³⁹Ar, and cosmogenic nuclide dating. Where implemented, the software will automate the incorporation of lab-curated geochemical data into synthesis and archival facilities.

[1] <https://sparrow-data.org>. [2] Peters, S.E. *et al. Geochem. Geophys.* **19**, 1393–1409 (2018). [3] Williams, J.W. *et al. Quat. Res.* **89**, 156–177 (2018). [4] McLean, N.M. *et al. Geochem. Geophys.* **17**, 2480–2496 (2016). [5] Wilkinson, M.D. *et al. Sci. Data* **3**, 160018 (2016).