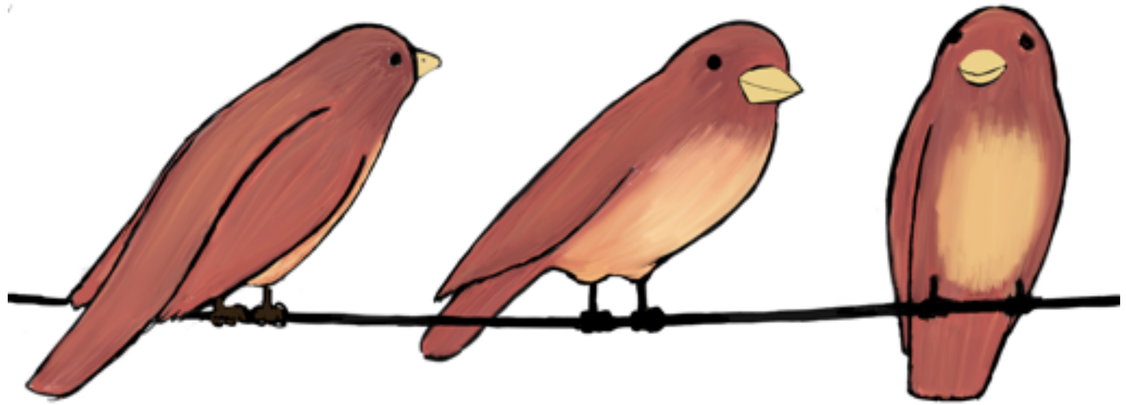
Sparrow: a **data management system** and **cyberinfrastructure component** for geochronology laboratories

Supported by
NSF EarthCube

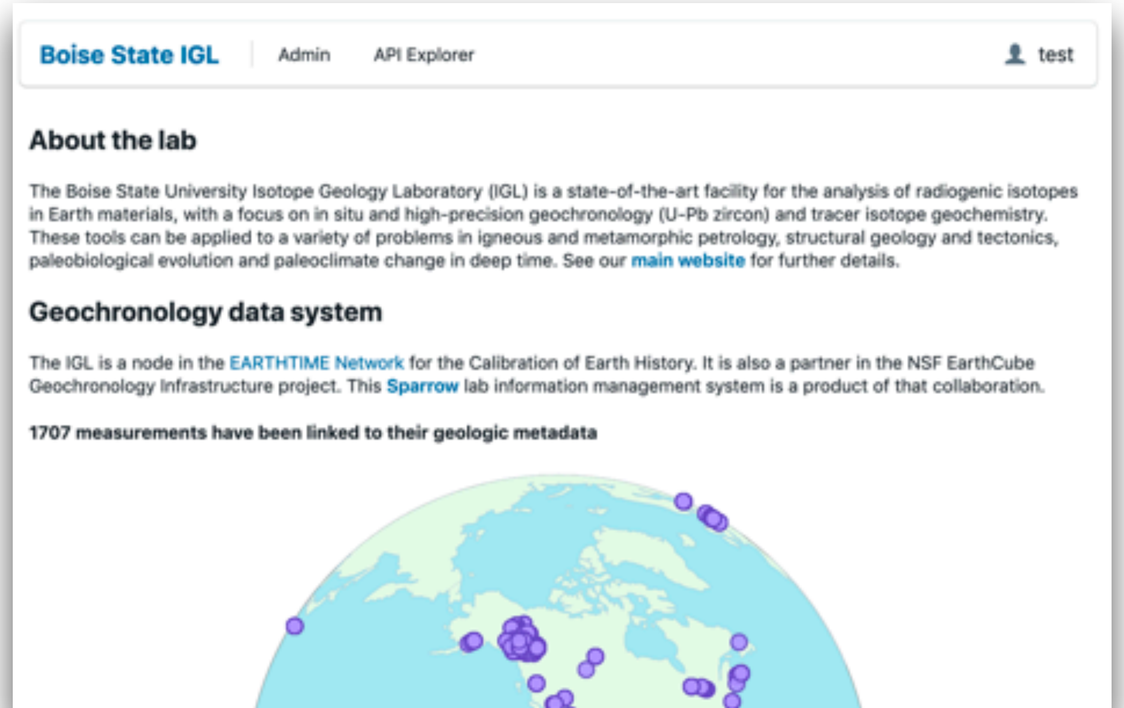


Daven P. Quinn (*UW–Madison*) and the *EarthCube Geochronology Frontiers* team

https://sparrow-data.org
Project information, documentation, and examples

https://github.com/EarthCubeGeochron/Sparrow
Open-source core software component

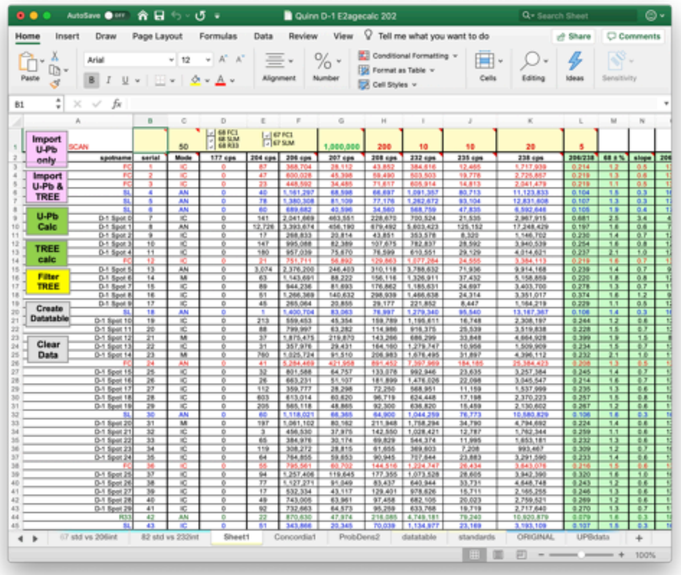
GSA 2019 Geochronology Division Town Hall

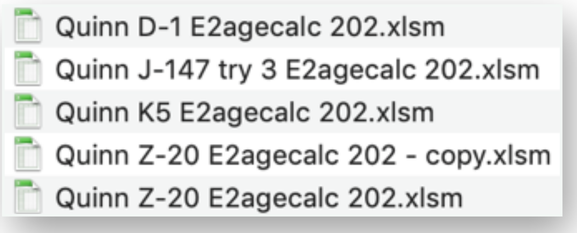


Geochronology lab data management

Currently: **analytical files**

- Analytical data files (e.g. spreadsheets, XML files)
- Ad-hoc file and revision management
- Not tied to contextual information





A typical E2AgeCalc workbook for detrital zircon geochronology

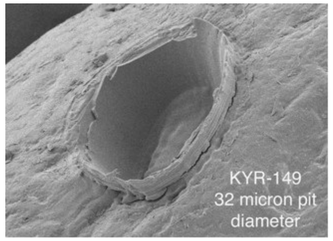
Goal: **structured archive**

- Database management system
- Revision management
- Standardized interchange formats
- *Machine-readable*

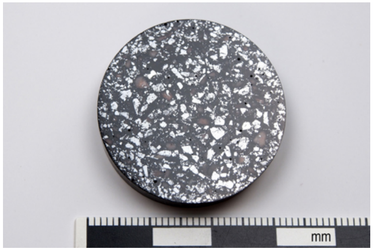
Single measured values

H2O content:	5.34 ±0.534(1s) %
De:	21.6 ±0.900(1s) Gy
OD:	24.0 %
luminescence age:	5.36 ±0.342(1s) ka
total dose rate:	4.03 ±0.195(1s) Gy/ka

Single instance of space- or time-resolved data collection



Grouped measurements in a single instrument run



The geologic material that was originally collected for analysis

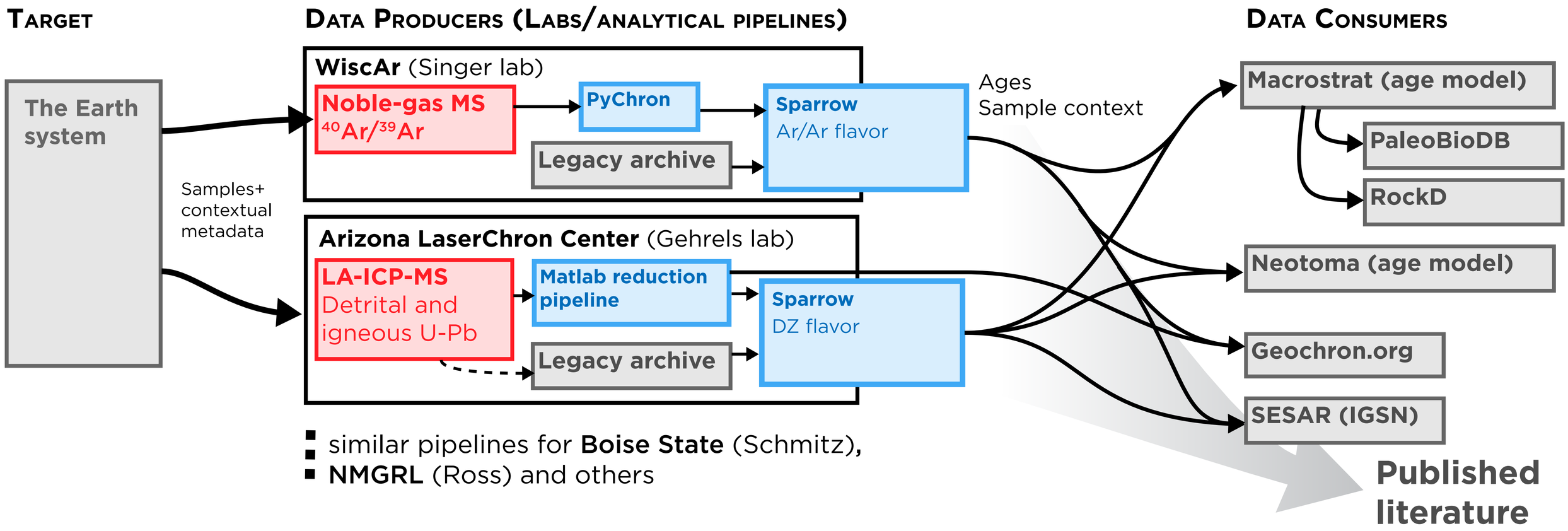


Datum → **Analysis** → **Session** → **Sample**

***Sparrow*: a structured archive for individual labs**

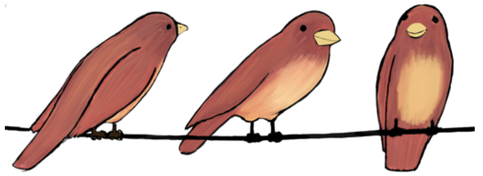
- Sits atop **current analytical process**
- **Labs maintain stewardship** of their data archive
- Harmonized interface for **automated data sharing**

Same software for many labs and chronometers!



https://sparrow-data.org

Sparrow: multiple interfaces for lab data



Machine-readable portal

https://sparrow.boisestate.edu/api/v1/datum

```
"value" : float 1007.2434800039756
"error" : float 7.874683365441775
"unit" : string "Ma"
"parameter" : string "plateau_age"
```

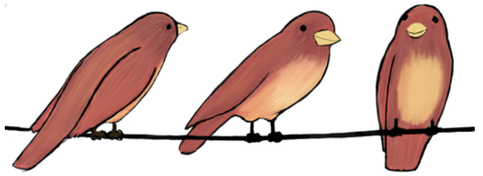
Consumers **pull** data from labs

Geochron

Macrostrat

etc.

Sparrow: multiple interfaces for lab data

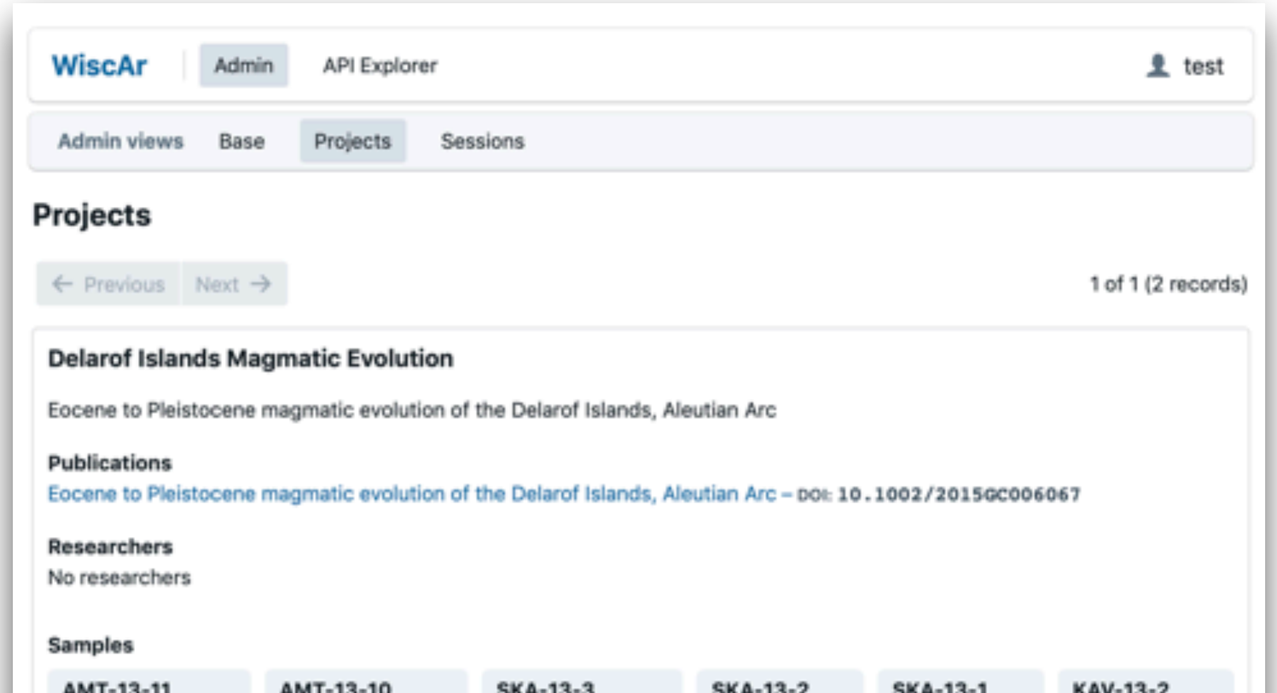


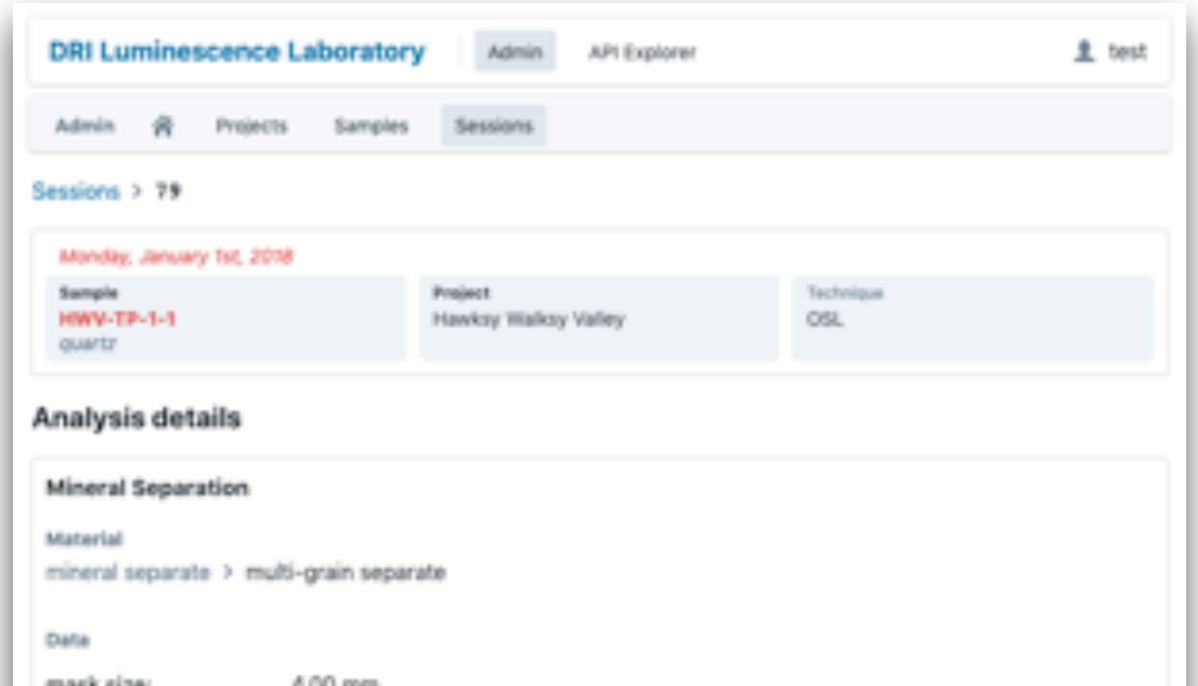
Metadata management

- Group data into projects
- Set embargo policy
- Describe **sample context**

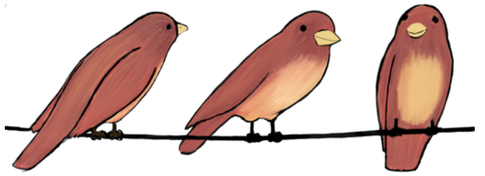
Integrations (current and planned)

- **GeoDeepDive:** Search and link publications
- **Macrostrat**: Search and link potential stratigraphic units and geologic entities
- **SESAR:** Request and link IGSNs

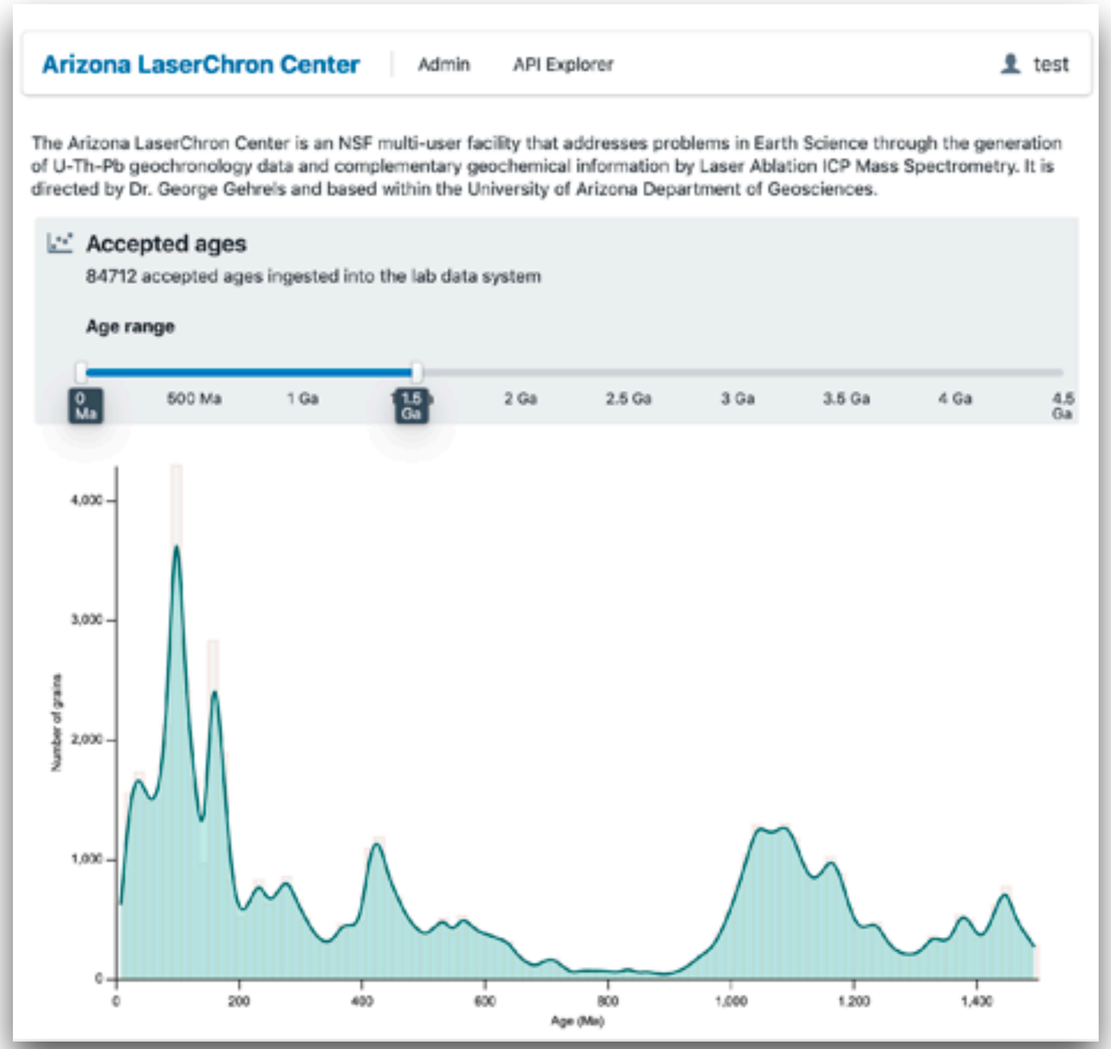


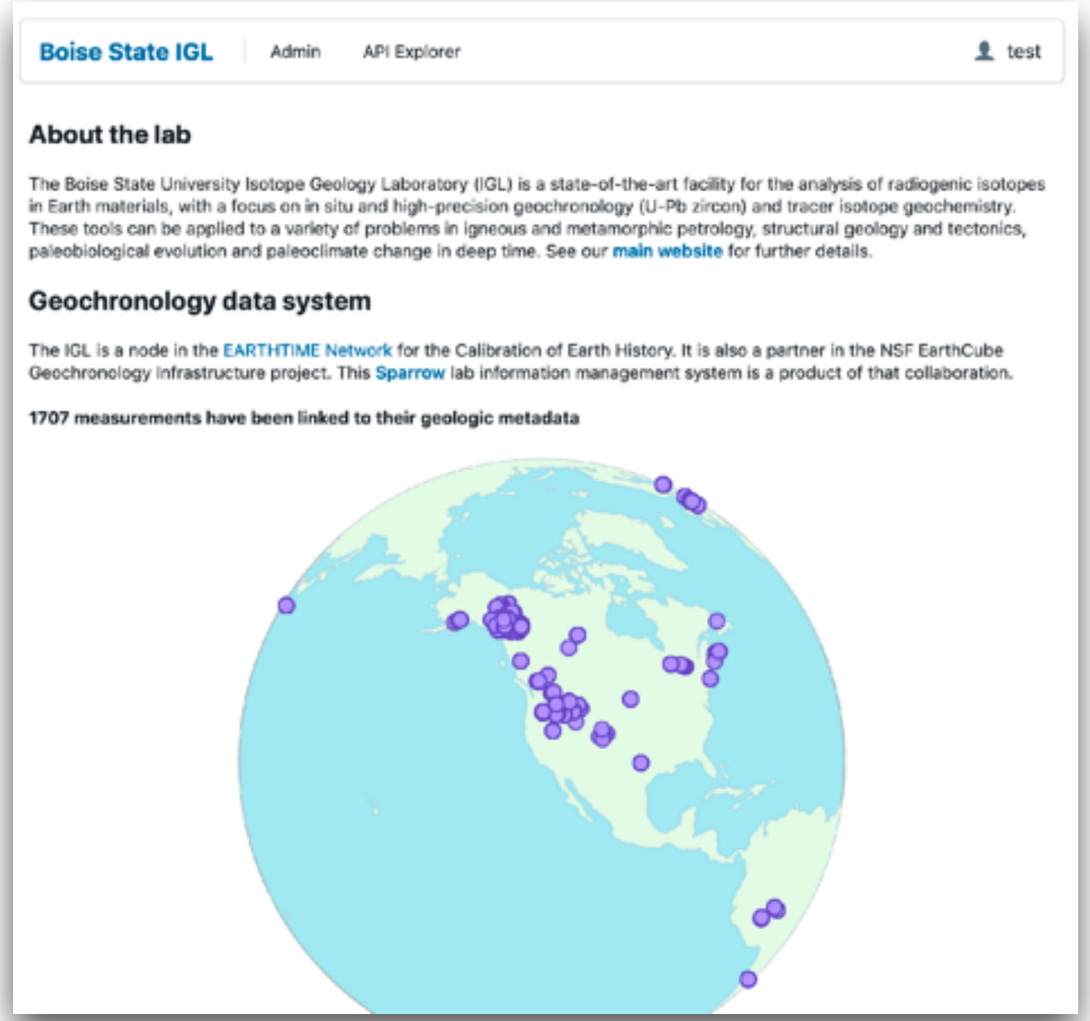


Sparrow: multiple interfaces for lab data

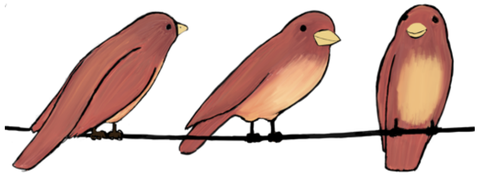


Customizable **visualization** of analytical and contextual information





Sparrow: same software, many chronometers



Partner labs

Uranium–Lead

- **Arizona LaserChron Center**
- **Boise State Isotope Geology Lab**
- **British Geological Survey**

Argon–Argon

- **WiscAr**
- **New Mexico Geochron. Research Lab**

Cosmogenic nuclides

- **Marcott Lab (UW Madison)**

(U+Th)/He thermochronology

- Flowers Lab (CU Boulder)

Optically-stimulated luminescence

- Desert Research Institute

We want more labs and methods to get involved!

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Project information, documentation, and examples

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Open-source core software component