



FLORIDA STATE
UNIVERSITY

FAIR Facilities and Instruments: Enabling transparency, reproducibility, and equity through persistent identifiers

Workshop #2 Introduction

Renaine Julian, Andrew Johnson, Matt Mayernik

NSF FAIR Open Science (FAIROS)

Research Coordination Network (RCN)

NSF Awards #2226396, 2226397, 2226398



Overview

- Project Overview & Team
- Progress and Outcomes to date
- Workshop Structure and Goals



Project Goals

- Develop a Research Coordination Network (RCN) focused on the assignment of Persistent Identifiers (PIDs) to research facilities and instrumentation
- Compile use cases for why and how PIDs might be assigned to facilities and instruments
- Facilitate the generation of expertise and guidance on the key topics of interest
- Produce recommendations and lessons learned targeted toward the specific use cases



Organizations & Personnel

NCAR | NATIONAL CENTER FOR
ATMOSPHERIC RESEARCH

Matt Mayernik
Greg Stossmeister



University of Colorado **Boulder**

Andrew Johnson
Aditya Ranganath
Matthew Murray

NSF Awards



2226396

2226397

2226398



FLORIDA STATE UNIVERSITY

Renaine Julian



Stanford University

Claudius Mundoma



Key Questions

F Findable - How do we enable people to find relevant facilities or instruments?

A Accessibility - How do we enable facilities and instruments to be accessible by wider audiences?

I Interoperability - How do we consistently capture relationships between persistent identifiers?

R Reusability - How can we incorporate information about facilities and instruments into data set provenance metadata more consistently?



Advisory Committee

- **Anita Bandrowski** - founder and CEO of SciCrunch
- **David S. Butcher** - FAIR data management specialist at the National High Magnetic Field Laboratory
- **Matthew Buys** and **Kelly Stathis** - Executive Director and Technical Community Manager at DataCite
- **Zach Chandler** - Director of Open Scholarship Strategy, Stanford University
- **Danielle Cooper** - Senior Program Associate, Mellon Foundation
- **Nate Herzog** - CoreMarketPlace project lead at Vermont Genetics Network.
- **Kevin Knudtson** - President of the Association of Biomolecular Resource Facilities (ABRF)
- **Giri Prakash** - Section Head of the Earth System Informatics and Data Discovery section at Oak Ridge National Laboratory
- **Dylan Ruediger** - Senior Analyst at Ithaka S+R
- **Shawna Sadler** - Head of Outreach & Partnerships at ORCID
- **Shelley Stall** - Sr. Director for Data Leadership at American Geophysical Union (AGU)



Example: doi Implementation

PIDs for Facilities and Instruments - NCAR

Integrated Surface Flux Sy

ISFS DESCRIPTION

NSF/NCAR C-130

Aircraft Overview

The Lockheed C-130 "Hercules" aircraft is a four-engine, medium-size utility aircraft that has proven to be one of the most well-known and versatile aircraft ever built. The NSF/NCAR aircraft is a model EC-130Q, similar to the more common model C-130H model except for electrical and air-conditioning modifications. The aircraft is an all-metal, pressurized, high-wing monoplane powered by four Allison T-56- A-15 turboprop engines. It is equipped with dual-wheel, tricycle landing gear with the main gear wheels arranged in tandem and the nose gear arranged side-by-side. The C-130 maintained and

C-130

NSF/NCAR C-130

- NSF/NCAR C-130 Investigator Handbook
- Airborne Instrumentation
- NSF/NCAR C-130 Request Guidance
- Aircraft Schedules
- Request the NSF/NCAR C-130
- Contact RAF



RRID Implementation at FSU

PIDs for Facilities and Instruments - FSU

- Campus wide FSU Scientific Equipment Portal
- Proof of concept - Universal Scientific Equipment Discovery Tool (USEDiT), a catalog of scientific equipment, using RRIDs as persistent identifiers. To date, 1788 pieces of large equipment have been assigned with RRIDs

A screenshot of the "SCIENTIFIC EQUIPMENT" portal. The page has a dark red header with "FLORIDA STATE UNIVERSITY" on the left and navigation icons on the right. The main content area is white with the university seal at the top center. Below the seal is the title "SCIENTIFIC EQUIPMENT". A search bar contains the text "Search Scientific Equipment" and has a magnifying glass icon, a "View All" link, and a "Reset" link. Below the search bar is the word "OR". There are three dropdown menus: "Group" with "Any" selected, "Facility" with "Any" selected, and "Department" with "Any" selected. To the right of these dropdowns is a dark red "GO!" button. At the bottom right of the form area is a link that says "Add Your Equipment".

FLORIDA STATE UNIVERSITY

SCIENTIFIC EQUIPMENT

Search Scientific Equipment [View All](#) [Reset](#)

OR

Group
Any

Facility
Any

Department
Any

[Add Your Equipment](#)



Examples: RRID Implementation

Shared Instrumentation Network

RESEARCH AND INNOVATION OFFICE

[Add Your Instrument](#)
[Core Facilities](#)
[Core Facilities Grant Program](#)
[Instruments: A - Z](#)
[Instruments: by Dept/Institute/Campus](#)
[Contact Us](#)



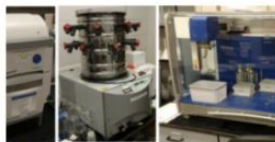
Core Facilities

Filter by Department / Unit

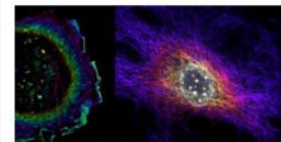
- Biochemistry
- BioFrontiers Institute
- Chemistry
- College of Engineering and Applied Science
- CU Green Labs
- Department of Integrative Physiology (IPHY)
- Department of Mechanical Engineering
- Department of Psychology and Neuroscience
- Ecology and Evolutionary Biology (EBIO)
- Geological Sciences
- JILA
- Molecular, Cellular & Developmental Biology (MCDB)
- Renewable and Sustainable Energy Institute (RASEI)
- Wilderness Place



Biochemistry Cell Culture Facility
(RRID:SCR_018988)



BioCore: Shared Equipment Program
(RRID:SCR_019302)



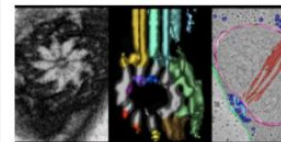
BioFrontiers Advanced Light Microscopy Core
(RRID:SCR_018302)



BioFrontiers Sequencing Facility
(RRID:SCR_019308)



BioKEM - BioChemistry Krios Electron Microscopy Facility
(RRID:SCR_019057)



Boulder Electron Microscopy Services Core Facility
(RRID:SCR_001432)





RRID Implementation at Stanford

Easily locate 30+ shared instrumentation facilities

<https://campus-map.stanford.edu/>



search & locate...

The screenshot shows the Stanford University campus map interface. A search bar at the top left contains the text 'snsf'. Below the search bar, a dropdown menu lists several facilities:

- electron & ion microscopy **snsf-eim** (rrid:scr_023230)
- soft & hybrid materials facility **snsf-smf** (rrid:scr_023230)
- stanford nano shared facilities snsf** (rrid:scr_023230)
- x-ray & surface analysis facilities **snsf-xsa** (rrid:scr_023230)

The 'stanford nano shared facilities snsf' entry is highlighted in red. Below the search results, a map of the Stanford campus is visible. A red circle highlights a location on the map, and a red arrow points from the search results to this location. A pop-up window for 'Stanford Nano Shared Facilities S NSF (RRID:SCR_023230)' is displayed over the map. The pop-up window includes a navigation menu with 'INFO', 'Operations Status', 'COVID-19 Policies', 'Feedback', 'Training Feedback', and 'SNSF'. Below the menu, the text 'Stanford Stanford Nano Shared Facilities' is visible. At the bottom of the pop-up, there is a photograph of two people looking at a document.



Year 1 Project Results

Aggregating information and resources

- Project website: <https://ncar.github.io/FAIR-Facilities-Instruments>
- Aggregating relevant people, projects, and documents

Focus groups

- 1-2 hour discussions
- Small groups of 5-10 participants from similar backgrounds and facility types
- Pre-focus group survey

Workshop #1 - Boulder, CO

- Topical talks from experts in the domain ([presentation slides](#))
- Three breakout focus groups facilitated by project team
- Compiling and synthesizing focus group information and workshop materials



Year 2 Project Activities

Recent project presentations

- Jan - American Meteorological Society, poster (Matt, Greg)
- March - Research Data Access and Preservation (RDAP) (Andrew)
- March - Year of Open Science culminating conference (Adi, Matt)
- April - Data Curation Network (Matthew, Andrew)
- April - ABRF panel (Renaine, Claudius)
- May - Rocky Mountain Advanced Computing Consortium High Performance Computing Symposium (Adi, Matthew)
- May - FSU Core facilities group (Renaine)
- May - Research Data Alliance (Matt)
- May - IASSIST/CARTO (Matthew)

Outputs:

- Paper submitted July 14 to Journal of eScience Librarianship
- Workshop #1 Report released in January, <https://doi.org/10.5065/zgsx-2d06>



Workshop #1 Boulder, CO

- 35 participants from:
 - 17 U.S. states
 - Academic institutions, national labs, nonprofit orgs, publishers, industry
 - Biomedical science, geological science, environmental science, space science, materials science, and more
- [18 presentations](#)
- 3 breakout sessions
- [Workshop report](#)





Observation #1 - Need

There is a need for PIDs for research instrumentation to encourage scientific reproducibility, ensure provenance of data, and provide credit for instrument developers and providers.

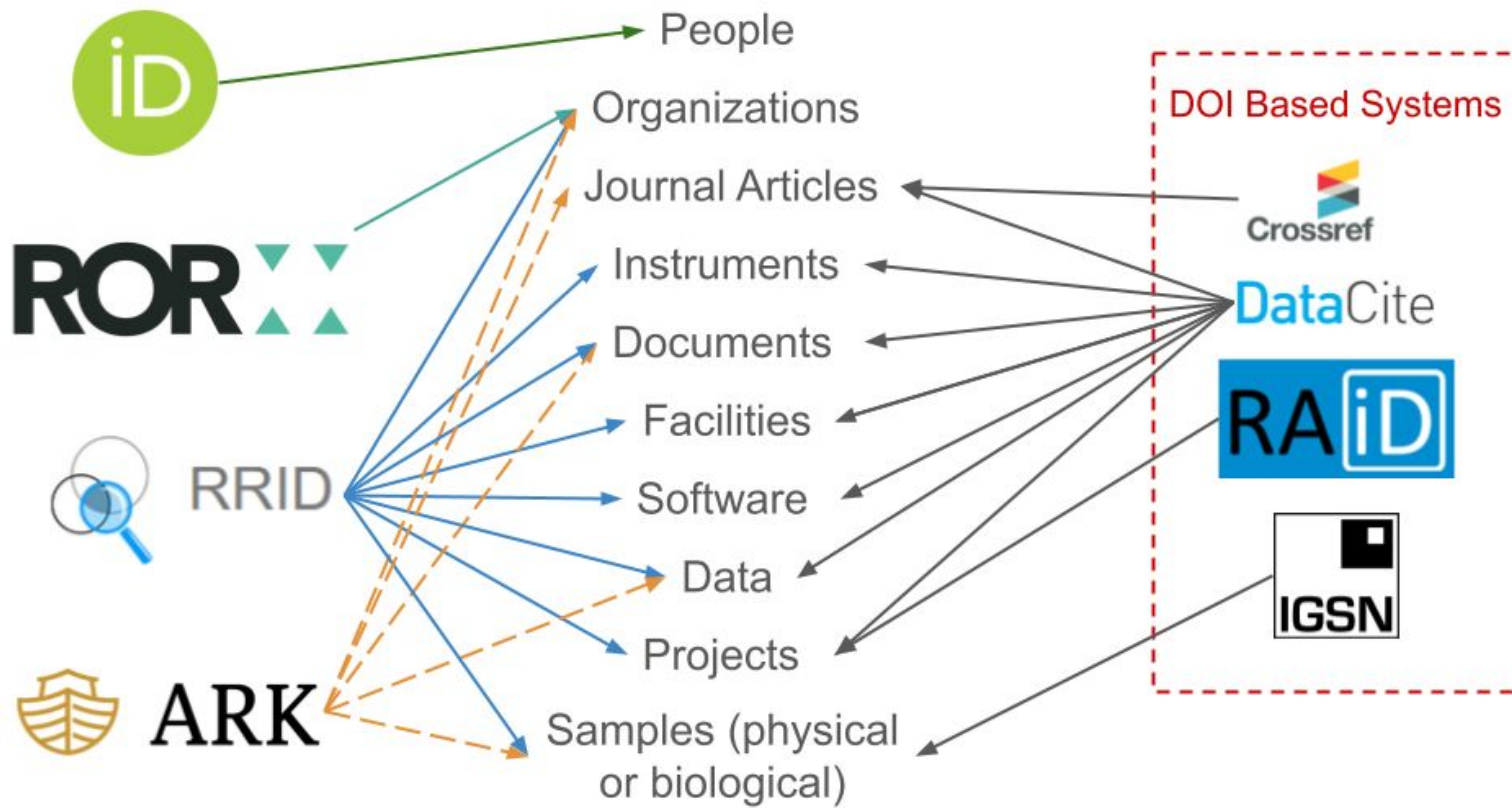
Community Responsibilities - All stakeholders should encourage the assignment of PIDs to research instrumentation, as well as the citation of those instruments in scholarly work that results from their use.



Observation #2 - PID Systems

The current use of PIDs for instruments is scattered and inconsistent in how and which PIDs are used. Multiple PID systems are already being used for the purposes of identifying research instrumentation.

Next Step For Our Project - A thorough comparison of the existing PID systems should be conducted, to evaluate their applicability for identification of facilities, platforms, and instruments for the most common use cases.





Observation #3 - Adoption

Question of which PID system to use is less important than finding ways to lower the barrier for adoption of instrument PIDs and better communicate the value of using them.

Next Step For Our Project - Develop guidance on how to navigate adoption considerations for the different PID options.

Community Responsibilities - PID systems should continue to work to make connections, to enable interoperability in services, such as PID resolving and metadata, and to clarify the value of each respective system.



Observation #4 - Metadata

Sometimes we need to think about metadata, in addition to PIDs. PIDs may not be appropriate to solve all challenges related to research traceability, transparency, and reproducibility.

Next Step For Our Project - Working from the [PIDINST](#) metadata recommendations, develop a set of implementation guidelines for the scientific community that includes how to keep metadata relevant and up to date and connect instrument PIDs to resulting dataset metadata.



Observation #5 - Granularity and Evolution

Granularity and evolution considerations can be very complicated for research instrumentation. A good rule of thumb is to start simple, and then move to more complicated approaches if needed.

Next Step For Our Project - Granularity and instrument evolution challenges need to be better understood across the various disciplines involved in order to develop guidelines that will support the highest community priorities whether those are impact tracking, credit to developers/operators and/or scientific reproducibility.



Observation #6 - Resource Limitations

Instrument and facility providers often face significant resource limitations that make assigning, managing, and promoting PIDs challenging.

Next Step For Our Project - Continue to gather data from research facilities and assess challenges across disciplines to develop guidance for how instrument and facility providers can most easily and efficiently begin the process of assigning PIDs.



Observation #7 - Value

Convincing users of the value of citing PIDs for instruments will be important to advance adoption.

Next Step For Our Project - Develop value statements about how PIDs help instrumentation and facilities providers to contribute to research being “born FAIR.”



Observation #8 - Incentives

While incentives can generally increase PID use and adoption, a lack of understanding of certain stakeholders' incentives can be a challenge.

Different incentives are needed on both the researcher and administrative sides to ensure adoption of PIDs.

Next Step For Our Project - Learn more about how PID use and citation can be made easier in hopes of encouraging use. Building better understanding of researcher and PI benefits and incentives for PID use and citation may reduce challenges.



Workshop #2: Tallahassee/FSU

- Goals
 - Discuss ongoing developments
 - Share experiences and expertise
 - Clarify key priorities and challenges
 - Identify opportunities for collaborations and next efforts



Workshop #2: Tallahassee/FSU

- Four sessions - speakers + group discussions
- Speakers - provide insights and examples to stimulate additional discussion in the breakout discussions
- Breakout discussions
 - Two with pre-organized questions
 - One (Wed afternoon) to focus on topics of your choice, using Slido





Join at

slido.com

#9282 9977





Questions?

- Questions about this project?
- Questions about the workshop?

