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The Open Science Framework & Reproducible Research: A New Space for Scholars & Librarians

Amanda Izenstark

University of Rhode Island, amanda@uri.edu

Andrée Rathemacher

University of Rhode Island, andree@uri.edu

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The Open Science Framework and Reproducible Research: A New Space for Scholars and Librarians

Amanda Izenstark, Professor Librarian
Andrée Rathemacher, Professor Librarian
University of Rhode Island
NELA/RILA Joint 2018 Conference
October 22, 2018

The Reproducibility Crisis

“It can be proven that most claimed research findings are false.”

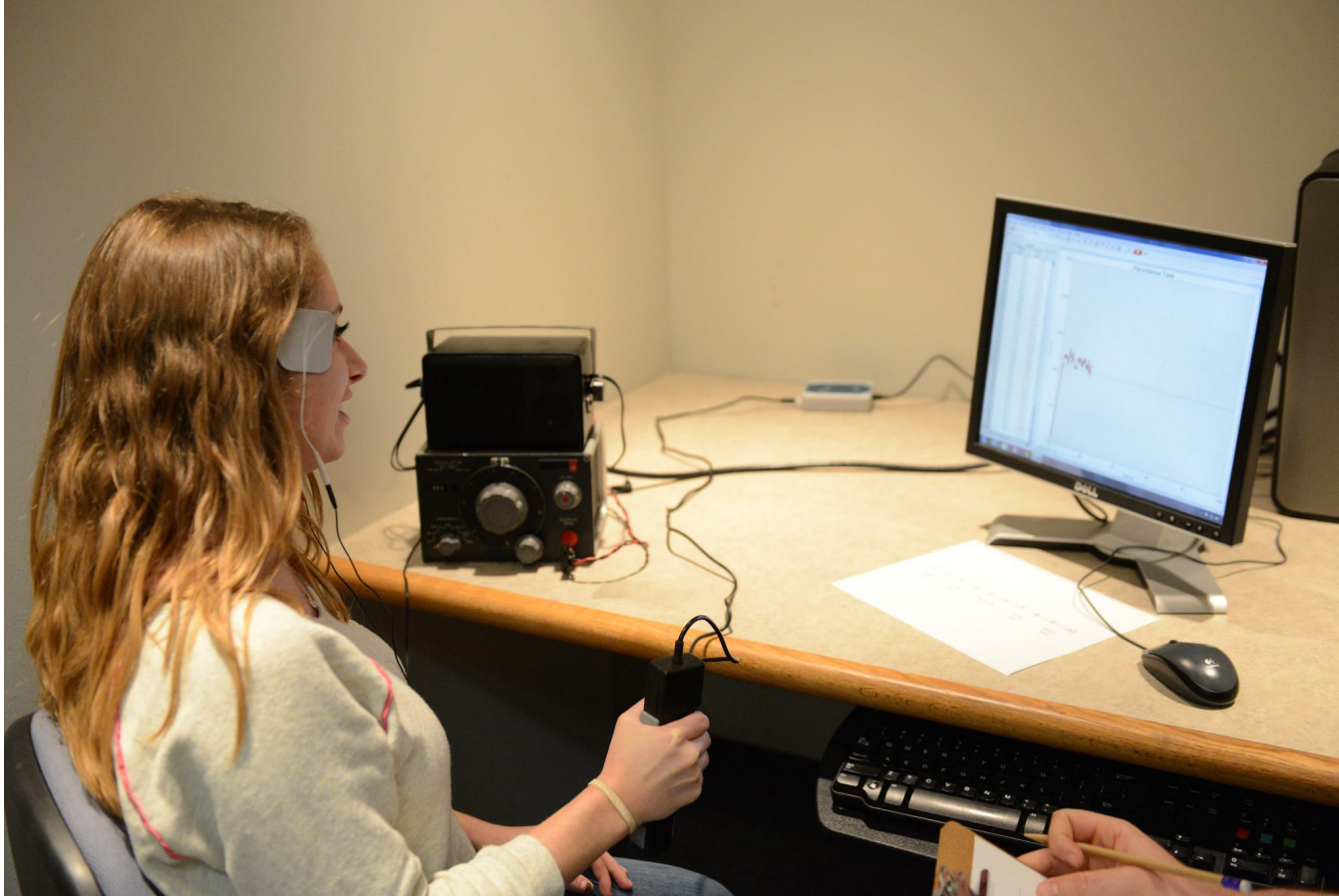
– John P. A. Ioannidis, 2005

“Reproducibility crisis” **(aka “replication crisis”)**

“A methodological crisis in science in which scientists have found that the results of many scientific experiments are difficult or impossible to replicate on subsequent investigation, either by independent researchers or by the original researchers themselves.”

– Wikipedia

Psychology



91.5% of
all
published
studies in
psychology
found
positive
results.

“[EEG Experiment](#)”
from Dr. Hirt’s
Psychology Lab,
Indiana University

Economics

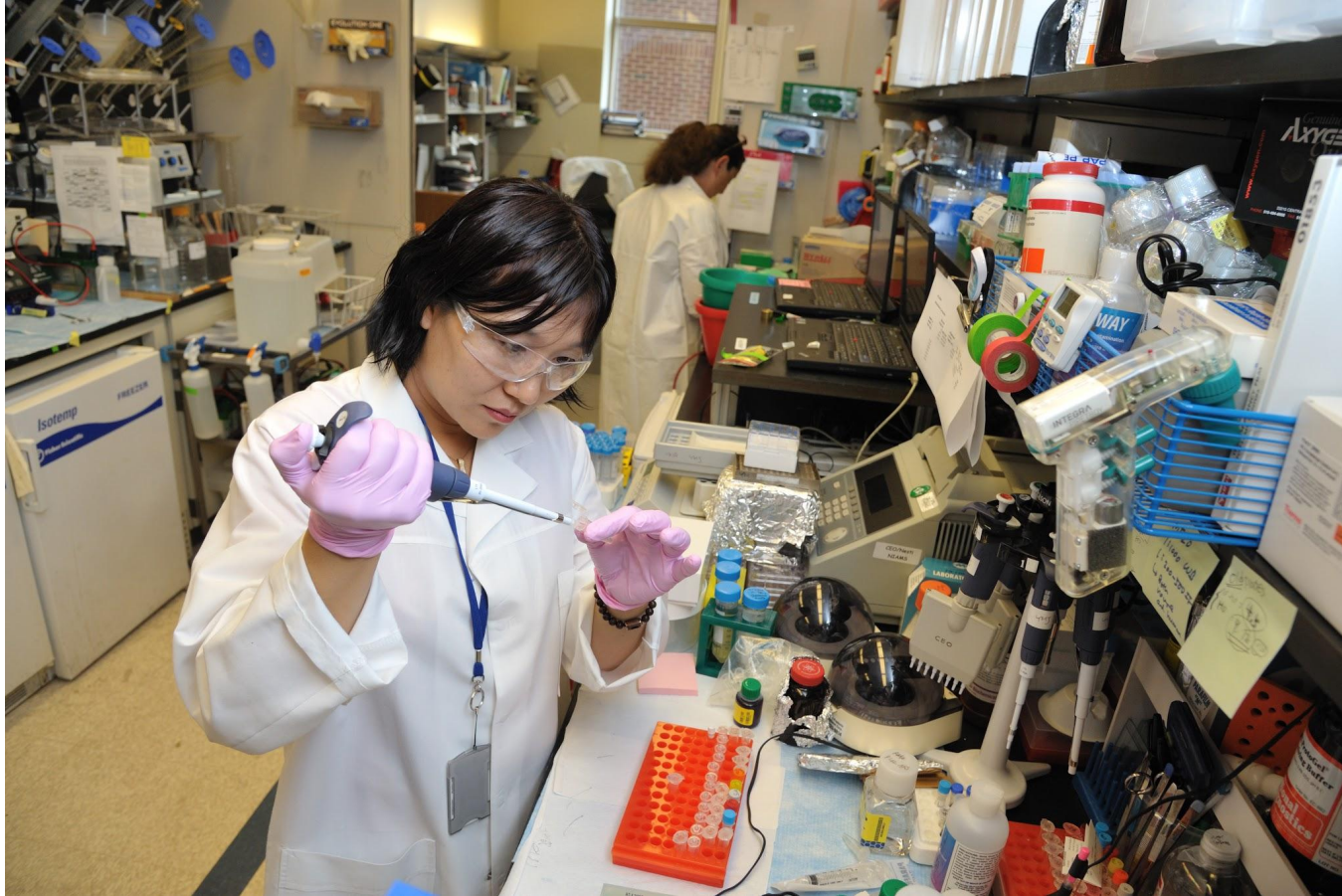


“...We assert that economics research is usually not replicable.”

– Andrew C. Chang
and Phillip Li,
2015

[“Homeless man resting on sidewalk. Vancouver, Canada”](#)
by Jay Black is licensed under
[CC BY-SA 2.0](#) via [Wikimedia Commons](#)

Biomedical research



[“The NIAMS Cartilage Biology and Orthopaedics Branch”](#) by [NIH Image Gallery](#) is licensed under [CC BY-NC 2.0](#)

Why? “File-drawer problem”

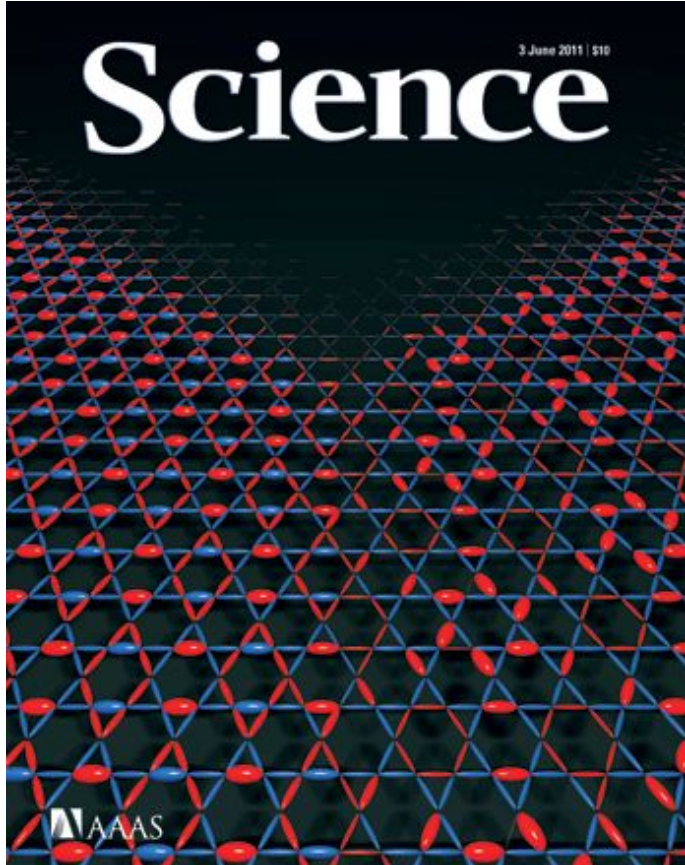


Researchers do not bother to write up experiments with negative or null results.

Instead of submitting them to journals, they file them away.

“[Filing](#)” by [Jeff Youngstrom](#) is licensed under [CC BY-NC 2.0](#)

Why? *Publication bias*

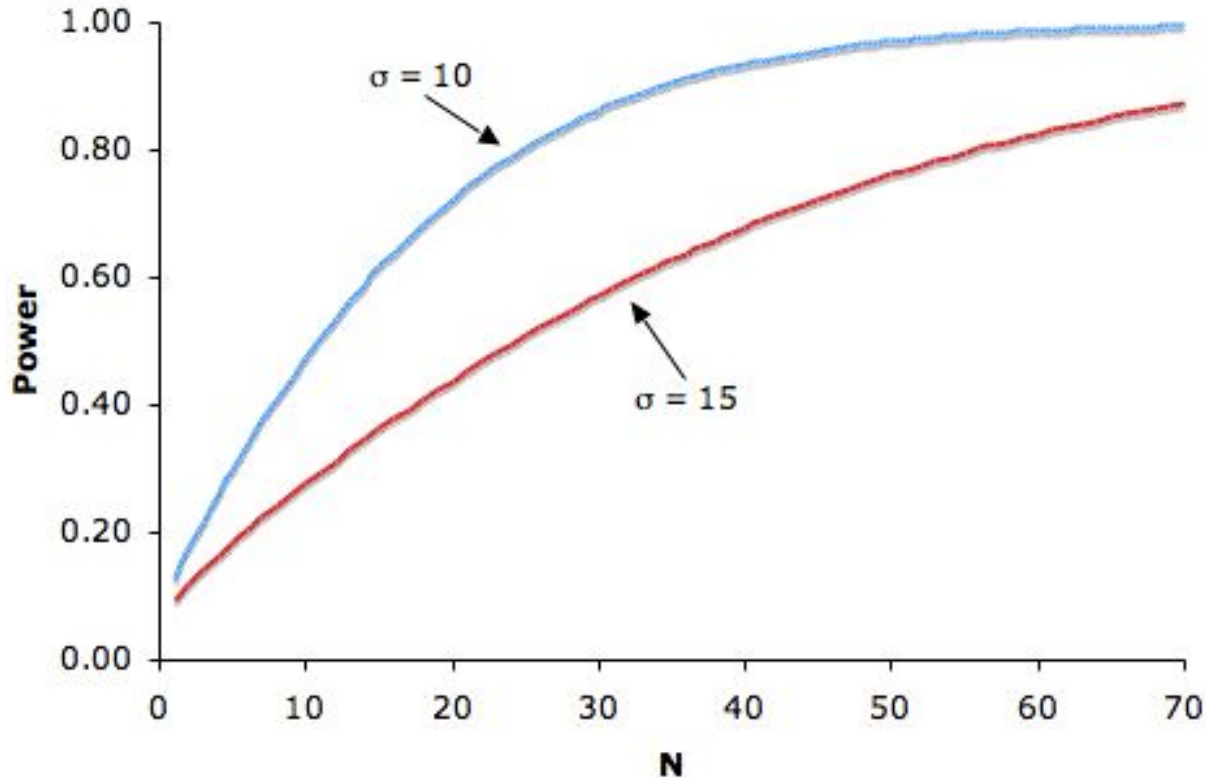


“...the small proportion of results chosen for publication are unrepresentative of scientists’ repeated samplings of the real world.”

– Neal S. Young, John P. A. Ioannidis, and Omar Al-Ubaydli, 2008

[Cover of Science v. 332, no. 6034](#) by the American Association for the Advancement of Science. Image by Stephen R. White.

Why? *Bad experimental design & analysis*



“If you torture the data long enough, it will confess.”

– Ronald Coase, recipient of the 1991 Nobel Prize in Economics

[“The Relationship Between Sample Size and Power”](#) by [Online Statistics Education: A Multimedia Course of Study](#) is in the public domain

Why? *Incentive structure*



“Today I wouldn’t get an academic job. It’s as simple as that. I don’t think I would be regarded as productive enough.”

– Peter Higgs, 2013 (winner of the 2013 Nobel Prize in Physics)

[“Prof. Meyerson in his funky Stanford gown”](#) by [Anna Majkowska](#) is licensed under [CC BY 2.0](#)

What about peer review?



“We need to get away from the notion, proven wrong on a daily basis, that peer review of any kind at any journal means that a work of science is correct.”

– Michael Eisen, 2014

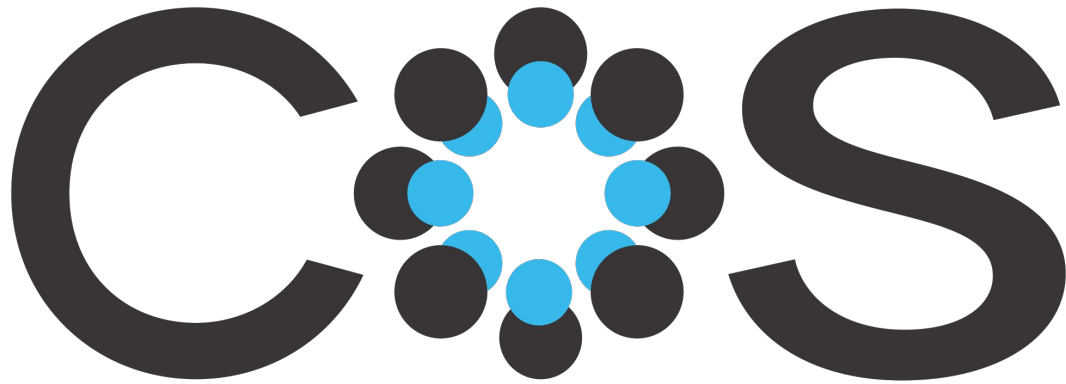
“[Peer Review Monster](#)” by [Gideon Burton](#) is licensed under [CC BY-SA 2.0](#)

Proposed solutions: *Registered reports*



Image source: Center for Open Science, <https://cos.io/rr/>

Proposed solutions: *Funding & publishing replications, publishing negative results*



— CENTER FOR —
OPEN SCIENCE

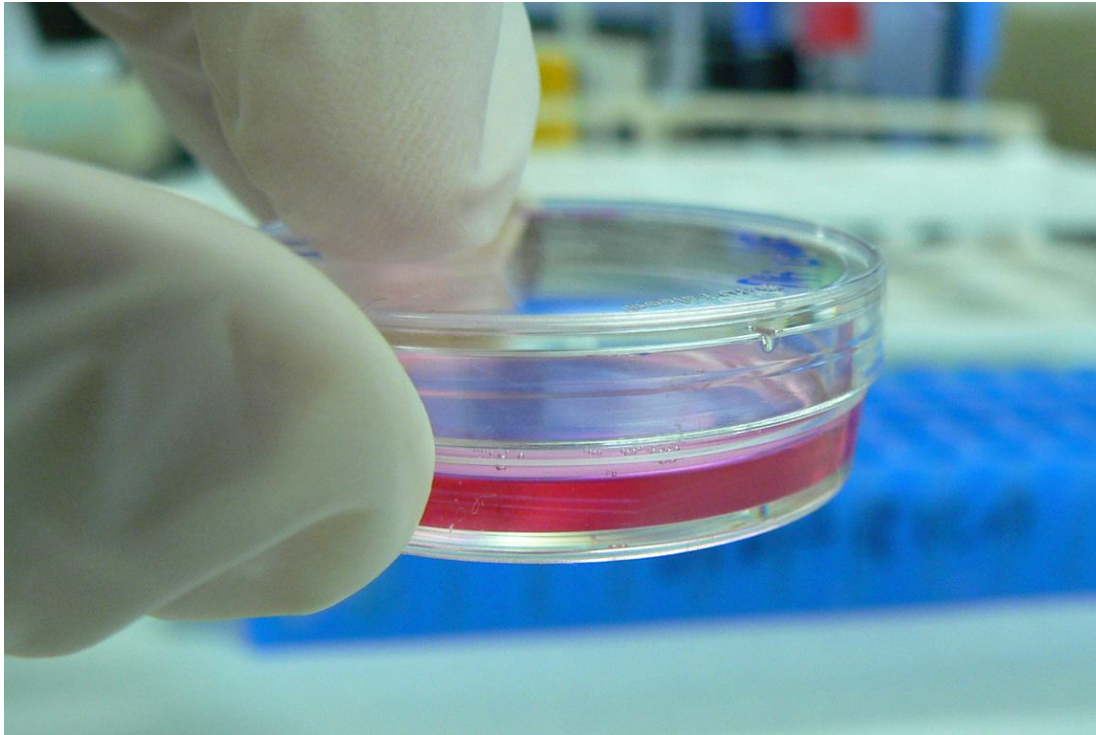
Image source: Center for
Open Science,
https://cdn.cos.io/static/images/cos_stack.png

Proposed solutions: *Open data*

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

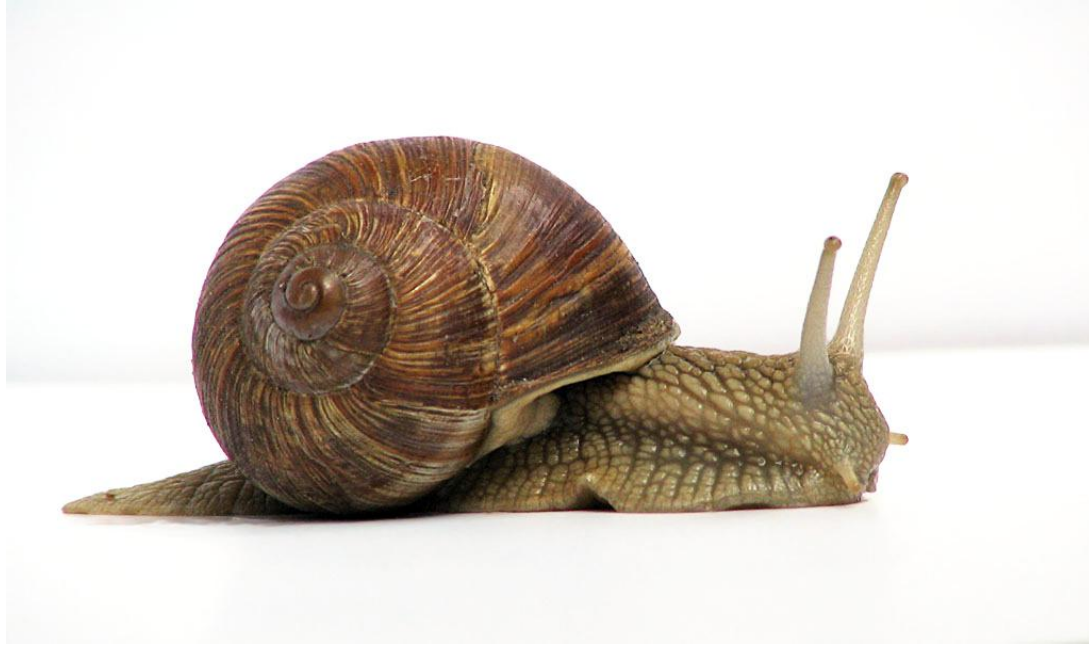
Image source: Registry of Research Data
Repositories, <http://www.re3data.org/>.

Proposed solutions: *Better study designs & statistical methods*



“[Cell Culture](#)” by [Umberto Salvagnin](#) is licensed under [CC BY 2.0](#)

Proposed solutions: *Slow science*



“Scrupulous research on difficult problems may require years of intense work before yielding coherent, publishable results.”

– Paul E. Smaldino and Richard McElreath, 2016

“[Weinbergschnecke 01](#)” by [Jürgen Schoner](#) is licensed under [CC BY-SA 3.0](#) via [Wikimedia Commons](#)

New Spaces for Scholars and Librarians

Why?

Increases Transparency at All Stages



Making all elements of research available for review, as well as preprints and final manuscripts, allow us to more critically evaluate what we're seeing.

Public domain image from <https://www.maxpixel.net/Under-water-Clear-Sea-Sand-Sunlight-Transparent-1956615>

For Scholars *and* Librarians



Try [boston education data](#) or [weather site.noaa.gov](#)

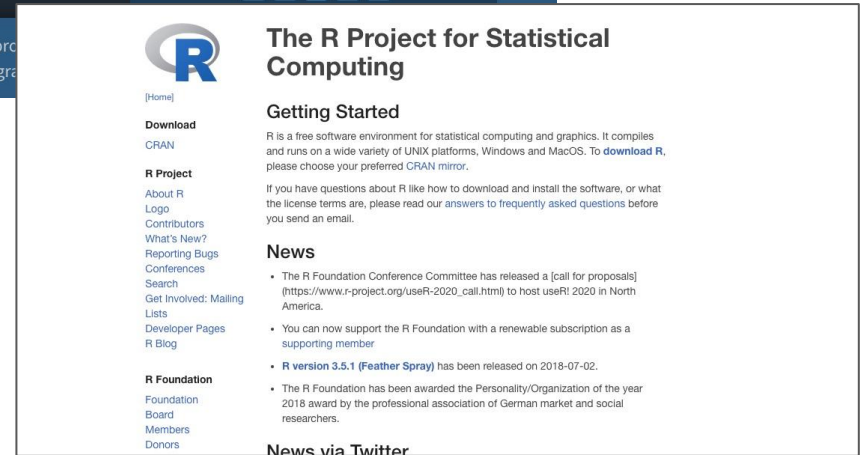
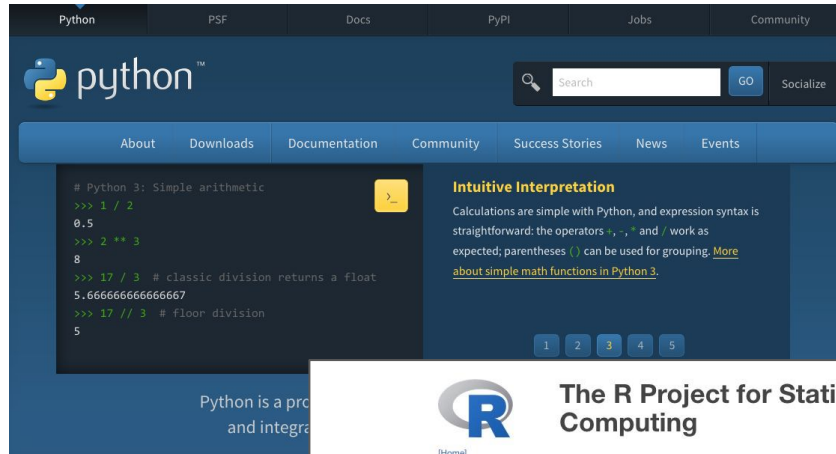
Open science increases availability of information that can benefit your patrons.

Data can be accessed directly - a huge boon for researchers, but also citizen scientists and students undertaking advanced school science projects.

Logos and search boxes from <https://figshare.com/>, <https://data.mendeley.com/>, <http://datadryad.org/>, <https://toolbox.google.com/datasetsearch>

Data Manipulation Tools and More

Use of open source programming and data manipulation tools, such as Python and R, also means exploring data doesn't entail a hefty cost.



Screenshots of the [Python Software Foundation](#) and the [The R Project](#) pages, accessed October 21, 2018

Academic librarians can:

- Raise awareness of these tools in instruction for grad students and consultations with faculty
- Use these tools to support and share their own research



“[Carothers Library](#)” by University of Rhode Island

Public librarians can:

- Raise awareness of these tools as appropriate
- Explore them on your own - you may have data to work with!

Computer & Online Resources



Introduction to Coding: Python for Beginners

Tuesdays, September 25 - November 6 (no class Oct.23) @ 7:00 - 8:45 pm

Third Floor Computer Lab, Main Library

Introduction to the world of computer programming, using the Python language in the Code Academy environment. You will learn about expressions, variables, logic, and control structures, and use them to write simple programs. Computer skills and email address required. Sign-up for first week and you are automatically registered for all six weeks.

Sep 25 - Nov 6 Register



Microsoft Word

Saturdays, September 15, October 13, November 10 @ 9:15 - 10:45 am

Third Floor Computer Lab, Main Library

An introductory class in the basics of Microsoft Word. Learn to create, edit, and format text and paragraphs, and save documents. This class is designed for students who have little or no familiarity with Word. **Basic knowledge of computers and a valid email address required.**

Sep 15 Register

Oct 13 Register

Nov 10 Register



Microsoft Excel

Saturdays, September 22, October 20 @ 9:15 - 10:45 am

Third Floor Computer Lab, Main Library

An introductory class in the basics of Microsoft Excel. Learn to create basic worksheets, edit, perform calculations, and save documents. **Basic knowledge of computers and a valid email address required.**

Sep 22 Register

Oct 20 Register



Microsoft PowerPoint

Saturday, September 29 @ 9:15 - 10:45 am

[Worcester Public Library: Adult Classes and Programs](#) page,
accessed October 10, 2018

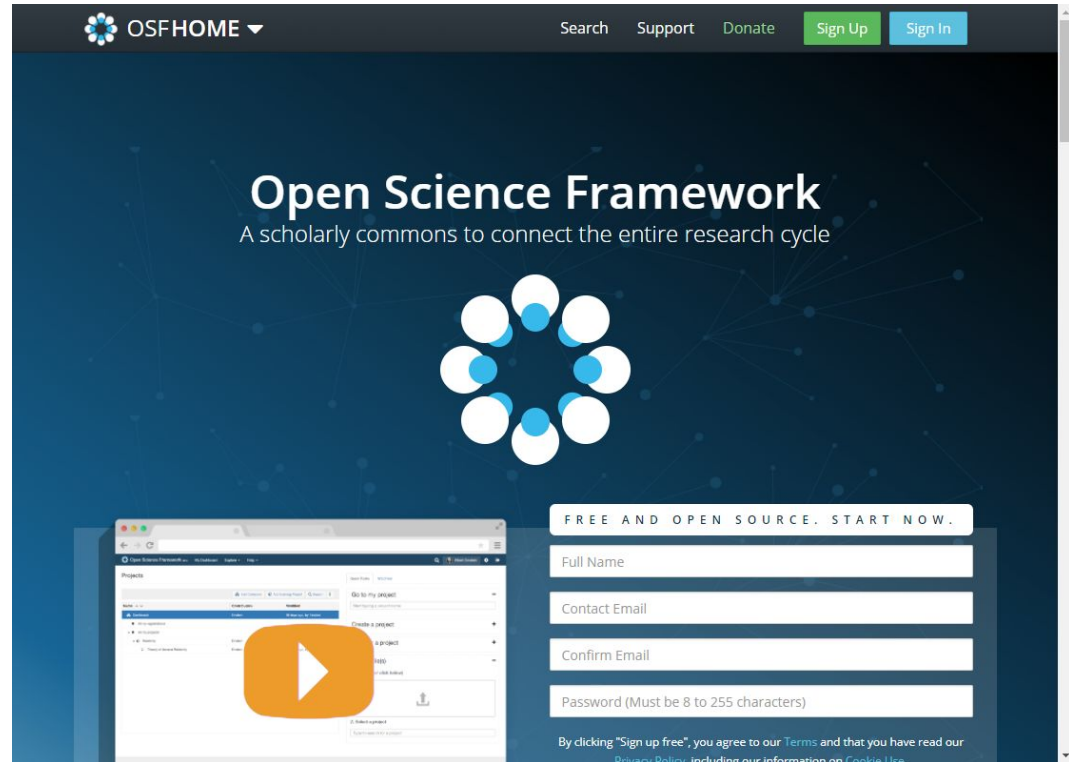
Introduction to The Open Science Framework

Why the Open Science Framework?

Project of the
Center for Open Science,
a nonprofit based in
Charlottesville, VA

Funded by a variety of
grants and sponsors,
including DARPA, the
NSF, NIH, and others.

<https://osf.io/>



OSFHOME

Search Support Donate Sign Up Sign In

Open Science Framework

A scholarly commons to connect the entire research cycle

FREE AND OPEN SOURCE. START NOW.

Full Name

Contact Email

Confirm Email

Password (Must be 8 to 255 characters)

By clicking "Sign up free", you agree to our [Terms](#) and that you have read our [Privacy Policy](#), including our information on [Cookie Use](#).

What it does

Connects various parts of your workflow, *wherever* they are

- Google Drive
- Dropbox
- Mendeley
- FigShare
- GitHub...

Share other non-project files individually as well (relatively new feature)

OSFHOME

My Quick Files My Projects Search Support Donate Amanda Izenstark

Demonstration Project Files Wiki Analytics Registrations Contributors **Add-ons** Settings

Select Add-ons

Select Add-ons

Configure Add-ons

Select Add-ons

Sync your projects with external services to help stay connected and organized. Select a category and browse the options.

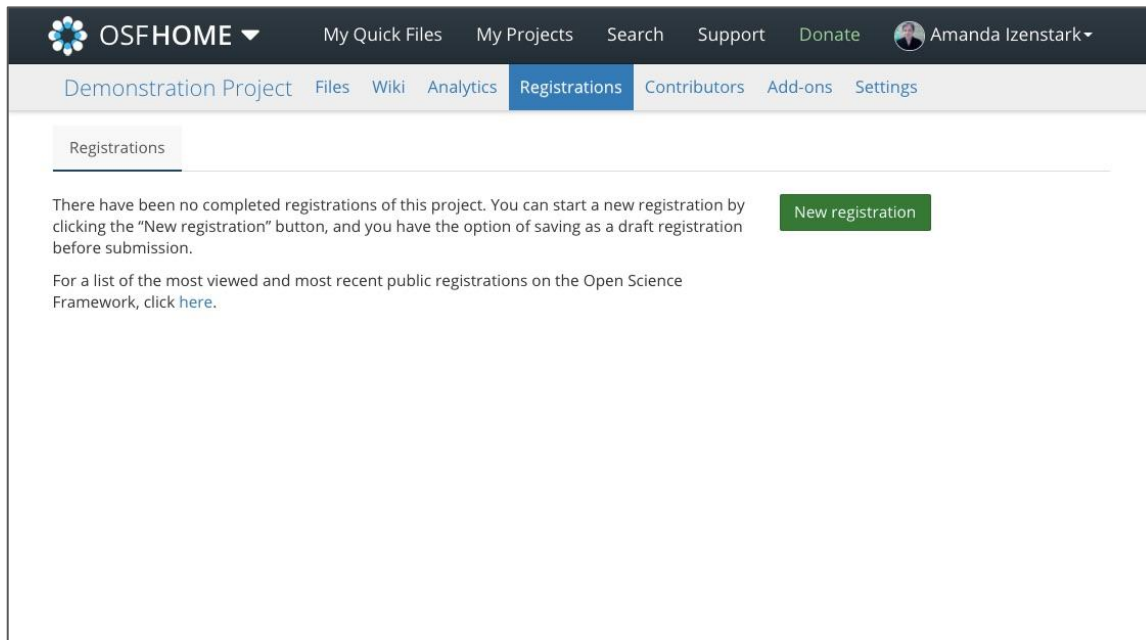
Categories	Search...
All	Amazon S3 Enable
Citations	Bitbucket Enable
Storage	Box Enable
	Dataverse Enable
	Dropbox Enable
	figshare Enable
	GitHub Enable
	GitLab Enable

What it does

Supports versioning

Allows date-stamped registration of research projects

Provides an additional backup of research materials

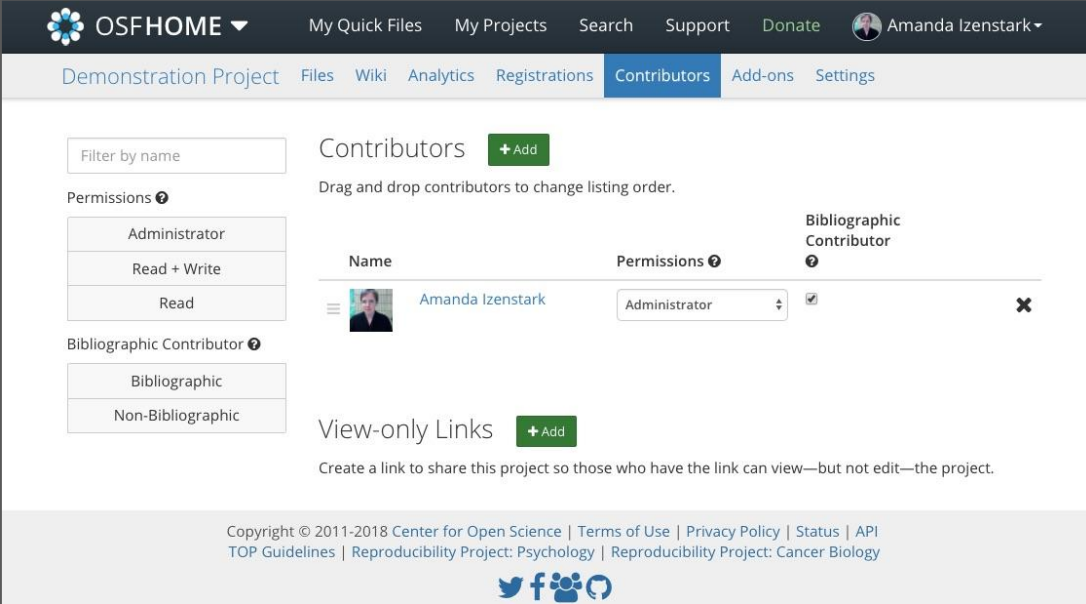


What it does

Centralizes access to research information

Provides granular sharing of elements with collaborators


Provides access for others who can provide feedback at any stage of the research process



The screenshot shows the OSFHOME interface for a "Demonstration Project". The top navigation bar includes "OSFHOME", "My Quick Files", "My Projects", "Search", "Support", "Donate", and a user profile for "Amanda Izenstark". The main navigation menu includes "Files", "Wiki", "Analytics", "Registrations", "Contributors" (highlighted), "Add-ons", and "Settings".

The "Contributors" section features a "Filter by name" input field, a "+ Add" button, and a "Permissions" dropdown menu with options: "Administrator", "Read + Write", and "Read". Below this is a "Bibliographic Contributor" dropdown with options: "Bibliographic" and "Non-Bibliographic".

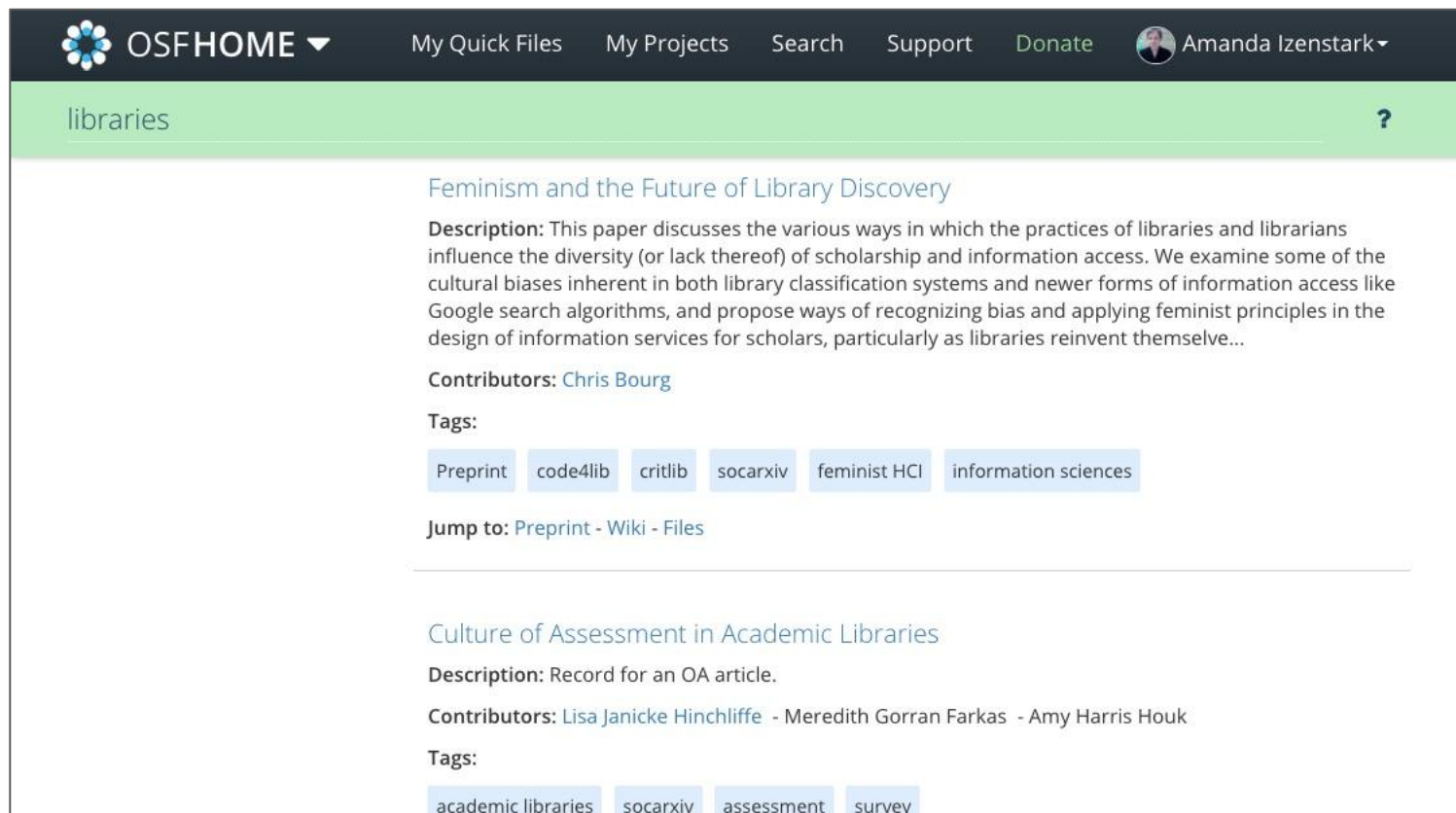
The main content area displays a table of contributors with the following structure:

Name	Permissions	Bibliographic Contributor
 Amanda Izenstark	Administrator	<input checked="" type="checkbox"/>

Below the table, there is a "View-only Links" section with a "+ Add" button and a note: "Create a link to share this project so those who have the link can view—but not edit—the project."

The footer contains copyright information: "Copyright © 2011-2018 Center for Open Science | Terms of Use | Privacy Policy | Status | API TOP Guidelines | Reproducibility Project: Psychology | Reproducibility Project: Cancer Biology" and social media icons for Twitter, Facebook, and GitHub.

Search others' projects



The screenshot shows the OSFHOME website interface. At the top, there is a dark navigation bar with the OSFHOME logo and a dropdown arrow, followed by links for 'My Quick Files', 'My Projects', 'Search', 'Support', 'Donate', and a user profile for 'Amanda Izenstark'. Below this is a light green search bar containing the text 'libraries' and a question mark icon. The main content area displays two search results. The first result is titled 'Feminism and the Future of Library Discovery'. Its description states: 'This paper discusses the various ways in which the practices of libraries and librarians influence the diversity (or lack thereof) of scholarship and information access. We examine some of the cultural biases inherent in both library classification systems and newer forms of information access like Google search algorithms, and propose ways of recognizing bias and applying feminist principles in the design of information services for scholars, particularly as libraries reinvent themselves...'. The contributor is listed as 'Chris Bourg'. The tags are 'Preprint', 'code4lib', 'critlib', 'socarxiv', 'feminist HCI', and 'information sciences'. Below the tags is a 'Jump to:' section with links for 'Preprint', 'Wiki', and 'Files'. The second result is titled 'Culture of Assessment in Academic Libraries'. Its description is 'Record for an OA article.'. The contributors are 'Lisa Janicke Hinchliffe', 'Meredith Gorran Farkas', and 'Amy Harris Houk'. The tags are 'academic libraries', 'socarxiv', 'assessment', and 'survey'.

OSFHOME ▾ My Quick Files My Projects Search Support Donate Amanda Izenstark ▾

libraries ?

Feminism and the Future of Library Discovery

Description: This paper discusses the various ways in which the practices of libraries and librarians influence the diversity (or lack thereof) of scholarship and information access. We examine some of the cultural biases inherent in both library classification systems and newer forms of information access like Google search algorithms, and propose ways of recognizing bias and applying feminist principles in the design of information services for scholars, particularly as libraries reinvent themselves...

Contributors: [Chris Bourg](#)

Tags:

Preprint code4lib critlib socarxiv feminist HCI information sciences

Jump to: [Preprint](#) - [Wiki](#) - [Files](#)

Culture of Assessment in Academic Libraries

Description: Record for an OA article.

Contributors: [Lisa Janicke Hinchliffe](#) - [Meredith Gorran Farkas](#) - [Amy Harris Houk](#)

Tags:

academic libraries socarxiv assessment survey

Learn more - even before publication

The screenshot shows the OSFHOME interface for a project titled "Precarity in Libraries". The top navigation bar includes the OSFHOME logo, a dropdown menu, and links for "My Quick Files", "My Projects", "Search", "Support", "Donate", and a user profile for "Amanda Izenstark". Below this, a secondary navigation bar highlights "Precarity in Libraries" and includes links for "Files", "Analytics", and "Registrations".

Precarity in Libraries

Contributors: [Adena Brons](#), [Chloe Riley](#), [Ean Henninger](#), [Crystal Yin](#)
Date created: 2018-04-17 01:22 PM | Last Updated: 2018-09-11 09:56 PM
Category: Project
License: CC-BY Attribution 4.0 International

Files

Name	Modified
Precarity in Libraries	
- OSF Storage (United States)	
BCLC2018-Precarity in librarie...	2018-05-10 08:0...

Citation

Recent Activity

- [Ean Henninger](#) added file [Partnership Job Board Data.xlsx](#) to OSF Storage in [Precarity in Libraries](#) 2018-09-11 09:56 PM
- [Ean Henninger](#) removed file [Partnership Job Board Data.xlsx](#) from OSF Storage in [Precarity in Libraries](#) 2018-09-11 09:55 PM

Additional Related Project - OSF Preprints



The image shows the homepage of the OSF Preprints website. The top navigation bar is dark blue and contains the OSF logo, the text "OSFPREPRINTS" with a dropdown arrow, and links for "My Preprints", "Add a Preprint", "Search", "Support", "Donate", and a user profile for "Amanda Ize...". The main content area has a dark blue background with the OSF logo and the text "OSFPREPRINTS" in large white and blue letters. Below this is a search bar with the placeholder text "Search preprints..." and a "Search" button. Under the search bar, it says "2,211,232 searchable as of October 21, 2018". Below that is the word "or" and a green button labeled "Add a preprint". At the bottom, there is a link that says "See an example".

OSFPREPRINTS ▼ My Preprints Add a Preprint Search Support Donate Amanda Ize... ▼

 OSFPREPRINTS

Search preprints... Search

2,211,232 searchable as of October 21, 2018

or

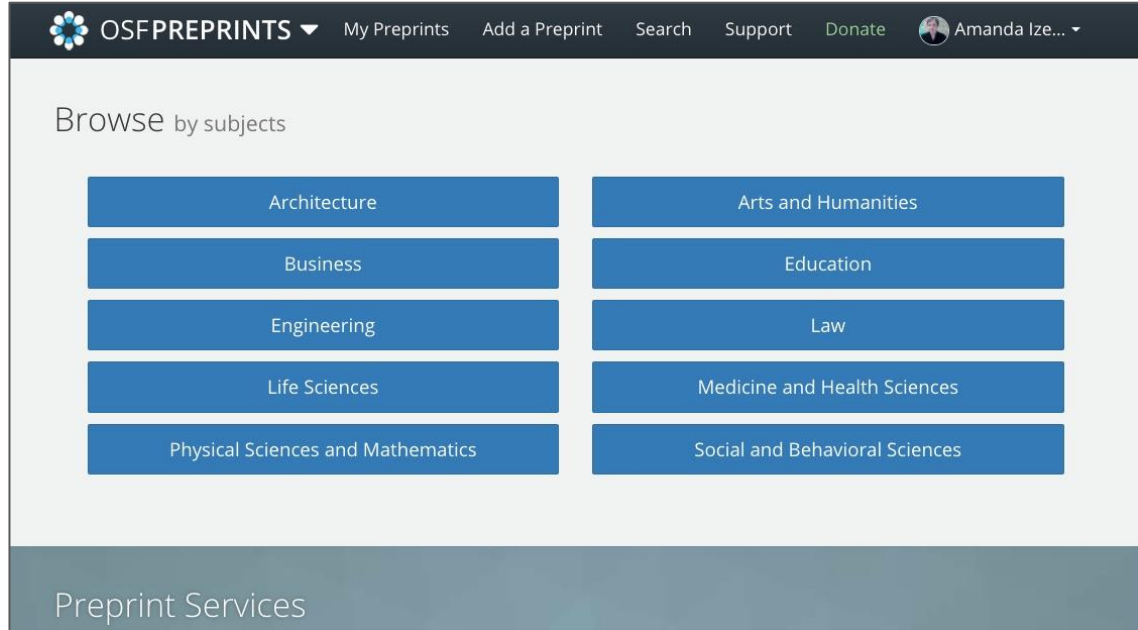
Add a preprint

[See an example](#)

Additional Related Project - OSF Preprints

Not just for science - includes the Arts & Humanities, Business, Education, Law, and more.

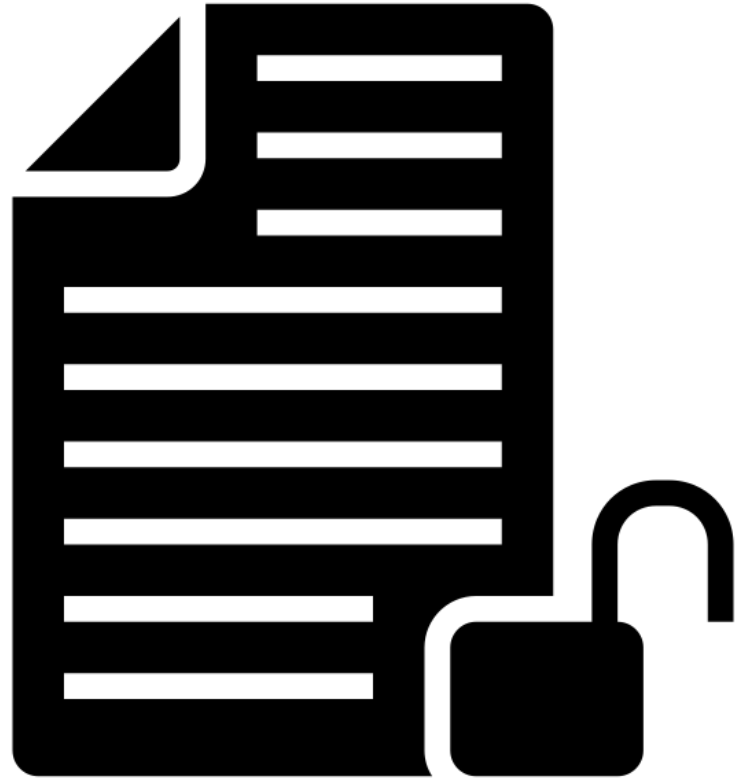
* Once research is published, encourage researchers to post their final manuscripts your institutional repository for increased visibility!



The screenshot displays the OSF Preprints website interface. At the top is a dark navigation bar with the OSF logo, the text 'OSFPREPRINTS', and several menu items: 'My Preprints', 'Add a Preprint', 'Search', 'Support', 'Donate', and a user profile for 'Amanda Ize...'. Below the navigation bar, the main content area is titled 'Browse by subjects'. This section features a grid of ten blue rectangular buttons, each representing a subject category: Architecture, Arts and Humanities, Business, Education, Engineering, Law, Life Sciences, Medicine and Health Sciences, Physical Sciences and Mathematics, and Social and Behavioral Sciences. At the bottom of the page, there is a dark grey footer with the text 'Preprint Services'.

OSF Bonus: No Institutional Affiliation Required!

Researchers don't need to be part of a university or company to post or search.



“Unlock File” icon by I Putu Kharismayadi from thenounproject.com.

Closing thoughts

“As readers of scientific work, all we can do is be more skeptical of everything that is published.”

– Cristobal Young, Assistant Professor of Sociology, Stanford University, 2015

“I want to adopt a stance of humility and assume that there are errors and that’s why I need to be cautious in my conclusions.”

– Brian Nosek, Professor of Psychology, University of Virginia and co-founder and director of the Center for Open Science, 2016

Thank you!

Amanda Izenstark

amanda@uri.edu

Professor, Reference & Instructional Design Librarian

Andrée Rathemacher

andree@uri.edu

Professor, Head of Acquisitions

THINK BIG  WE DOSM

