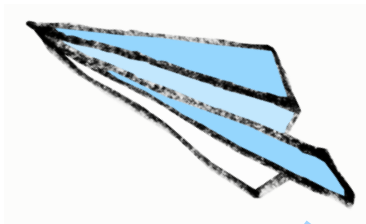




Annual Report 2023



We connect

today's research to tomorrow's discoveries



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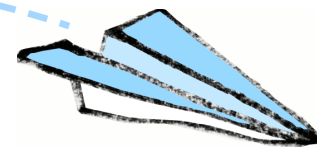
About arXiv

Who we are

arXiv is a curated research-sharing platform whose purpose is to promote scientific innovation and equitable access to scholarship across the globe. Since our founding in 1991, arXiv has been free to use and open to all.

A pioneer of open access for over 30 years, arXiv now hosts more than 2.3 million scholarly articles in eight subject areas. arXiv's community of volunteer moderators are experts in their fields who, along with our editorial team, ensure content quality while remaining dedicated to distribution at the speed-of-science. arXiv is a repository for articles and so much more: arXiv provides an article submission portal, a TeX compilation service, search and discovery tools, web distribution for human readers, API access, machine-readable data sets, and community-developed tools to enhance user experience.

Our emphasis on openness, collaboration, and scholarship — as well as the open access community that supports us — provides a strong foundation for arXiv to continue to grow and thrive.





Mission

arXiv is an open platform where researchers can share and discover new, relevant, and emerging science and establish their contribution to advancing research.

Vision

Our vision is for all researchers around the world to have immediate, free, and open access to established and emerging research in their field.

Values

- ▶ arXiv is open, above all. The foundation of arXiv is based on open access, transparency, open mindedness, collaboration, and flexibility.
- ▶ arXiv is a community. Our staff, institutional members, collaborators, moderators, authors, and readers all make arXiv possible – together, we are arXiv.
- ▶ arXiv is passionate about science – and access to science. Science is for everyone, and arXiv makes sure it stays that way.
- ▶ arXiv does more with less. To best serve researchers and research, arXiv runs lean – everything we have goes into the work.
- ▶ arXiv values excellence. We meet the challenges of the future with a collective passion for our work and our community.

Message from **Greg Morrisett**, Jack and Rilla Neafsey Dean and Vice Provost at Cornell Tech

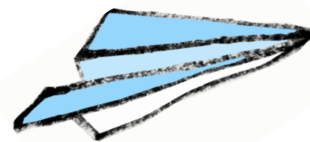
arXiv is such an important service for the open science community, and I am proud to have Cornell Tech as the home and steward of such a vital catalyst for research and innovation. Science is happening in real time on arXiv, and every decision we make is steeped in the knowledge that we are responsible for a critical community resource. Making sure arXiv can grow sustainably and continue to serve the needs of the global research community is not an easy task. The explosive growth of machine learning and AI submissions to arXiv makes scaling up, building resilient technical systems, and navigating the ever-changing landscape of scholarly communications immense – and immensely important – challenges to overcome. In 2023, arXiv received generous additional funding from both the Simons Foundation and the National Science Foundation, which will be critical in allowing arXiv to meet these challenges. Ramin Zabih, arXiv’s faculty director, has made excellent strides in his early leadership of arXiv, including overseeing arXiv staff growth and ambitious projects, such as arXiv’s experimental HTML, improving arXiv for researchers of all abilities. I am also thankful for the unwavering support of the Simons Foundation and all of our members and donors. I am deeply grateful to the community for ensuring that arXiv thrives well into the future.



Message from **Ramin Zabih**, arXiv Faculty Director and Professor of Computer Science, Cornell Tech

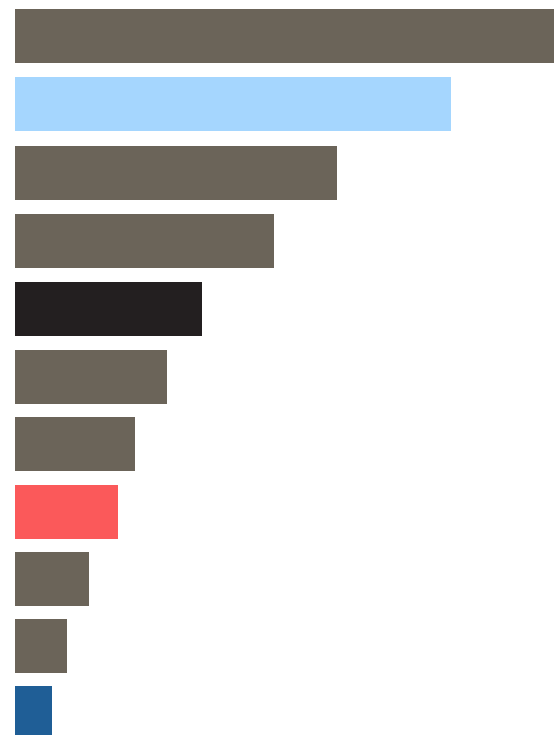
As a researcher, I know firsthand how important arXiv is to scientists around the world. My goal as arXiv's Faculty Director is to stay true to the qualities of arXiv that have made it a vital resource to the research community, while updating it to take advantage of new technologies that have developed in the decades since its founding. Our critical priorities in 2023 were to begin, in earnest, our efforts to modernize arXiv's software by moving it to the cloud. Thanks to generous additional support from the Simons Foundation, we were able to bring on new developers to help with this essential project. Upgrading the technical operations of a global service with a 30-year history is no easy task, but it is essential to support the continued growth and sustainability of arXiv. Looking forward to 2024, we will continue to modernize arXiv's technology to make sure we are able to deliver the discoverability and interoperability that researchers depend on to discover new research and share their work. I'm especially grateful for grant funding from the National Science Foundation that will allow arXiv, in collaboration with Cornell University computer science researchers, to achieve this important goal. We take our role as a leader of the open science movement very seriously and are grateful to our community for joining us on this journey to ensure scientific research papers remain openly accessible to all.





arXiv in Numbers

3.1 billion total downloads
5 million+ monthly active users
2.4 million total submissions
208,493 new submissions in 2023
30,000 user support tickets this year
17,000 submissions per month
278 members
205 moderators
153 categories
29 advisory council members
21 staff members



Most submissions in a month, ever

20,710 in October 2023

arXiv as an Organization



open, sustainable,
community-driven

In this section, learn how arXiv operates as a vital open infrastructure. We'll discuss arXiv's financial report, our membership program, and additional funding. We'll also give an overview of our new governance model and our work with Invest in Open Infrastructure to support future growth.

Solid foundations for sustainable growth

With arXiv's leadership team fully in place at the close of 2022, 2023 began with a refreshed perspective and the ability to address foundational issues and support sustainable arXiv growth. Yoav Artzi joined arXiv as associate faculty director, arXiv's governance model was reorganized, and arXiv's staff and leadership came together to develop a roadmap to support arXiv's success in the future.

Staff headcount grew to meet arXiv's needs. While we said a heartfelt goodbye to Alison Fromme, Community Engagement Manager, as she pursued new opportunities within Cornell University, we welcomed Kat Boboris to lead our communications, membership, and fundraising programs. Jake Weiskoff stepped into a new role as Project Manager, and Alison Hofer joined arXiv as our inaugural Documentation Specialist. We also continued to grow our development team, welcoming Naoyuki Tai, William Yao, and Erin Reddy. At the close of 2023, arXiv began the search for new talent to expand our editorial team in the face of ever-growing submissions.

In October 2023, both the Simons Foundation and the National Science Foundation announced additional support for arXiv, which together totaled \$10 million in gifts and grants.

The changes and growth in 2023, as well as generous funding, have well-positioned arXiv to fulfill our core mission of championing open science while continuing to strengthen our organizational infrastructure and strategize for future growth.

Staff additions support arXiv goals

We were so pleased to welcome many new members to the arXiv team this year. We are especially grateful for the generous additional support from the Simons Foundation, which made it possible for arXiv to add five new positions to our technical team.

These crucial additions to arXiv will be focused on the important tech migration project underway in 2023 and beyond.

Stephanie Orphan, arXiv Program Director

2023 was a year of change and growth for arXiv. We expanded our staff and are making real strides in our technology migration work. A new governance model was launched to streamline arXiv's decision making processes and operational effectiveness and to ensure that there are opportunities for new voices to be heard. The groundwork laid in the past year has prepared us for a bright future, which we look forward to sharing with you.



Financial Report

Year In Review:

Fiscal Year 2023 (July 1, 2022 – June 30, 2023)

arXiv ended fiscal year 2023 (FY23) with gifts and member contributions \$231,475 (15%) below budgeted expectations and personnel expenses that were higher than previous years. Following two years in which contributions exceeded expectations and arXiv contributed to its financial reserves, in FY23 we relied on reserves to balance our budget. It should be noted that the initial FY23 budget was substantially larger than that of previous years to accommodate our technology migration. However, sponsored funding to support the project, and the corresponding staff growth, was delayed until early fiscal year 2024; therefore, the year-end actual numbers do not align with those budgeted.

Mid-Year Performance:

(July 1, 2023 – December 31, 2023)

As of December 2023 (mid-year FY24), both revenues and expenses are aligned with budget expectations. While arXiv operates on a traditional fiscal year, our membership program operates on a calendar year cycle, and most invoices go out in the first months of the new year. With this in mind, gifts and member contributions are as anticipated. We expect to meet budgeted gift and member contributions by June 30, 2024 (end of FY24).

Looking Ahead:

Fiscal Year 2024 (July 1, 2023 – June 30, 2024)

The FY2024 budget is substantially larger than the budget of the preceding year. This increase reflects the first of three years of sponsored funding from the Simons Foundation to migrate arXiv to the cloud and complete related work to update our code base. The increase in personnel expenses corresponds with hiring on the arXiv development team to work on the technology migration. We have again budgeted to use operating reserves in fiscal 2024 while we work on expanding our funding base.



arXiv Budget 2023

	FY23	FY24	
REVENUE	(Actuals EOY)	(Budget)	(Actuals 12/31)
Gifts and Member Contributions	\$ 1,268,525	\$ 1,500,000	\$ 390,079
Cornell Contribution (In Kind) ¹	\$ 891,173	\$ 1,471,328	\$ 603,398
Sponsored Funding	\$ 530,894	\$ 2,223,324	\$ 1,027,110
TOTAL REVENUE	\$ 2,690,592	\$ 5,194,652	\$ 2,020,587
EXPENSES			
Personnel Expenses			
<i>Total Personnel Expenses</i>	<i>\$ 2,018,368</i>	\$ 2,906,532	\$ 1,371,410
Non-Personnel Expenses			
Services - Technical	\$ 207,240	\$ 250,000	\$ 105,377
Services - Professional	\$ 81,958	\$ 101,615	\$ 46,729
Services - Legal	\$ 344	\$ 5,000	\$ 142
Meetings and Travel	\$ 44,534	\$ 75,000	\$ 10,574
Other General Expense	\$ 56,133	\$ 80,000	\$ 20,546
Other Sponsored Activity ²		\$ 558,415	\$ 72,045
Indirect Costs ¹	\$ 950,498	\$ 1,698,347	\$ 662,723
<i>Total Non-Personnel Expenses</i>	<i>\$ 1,340,707</i>	\$ 2,768,377	\$ 918,136
TOTAL EXPENSES	\$ 3,359,075	\$ 5,674,909	\$ 2,289,546
TOTAL NET OPERATING	\$ (668,483)	\$ (480,257)	\$ (268,958)

arXiv's new governance model

Equitable representation, accountability, and transparency

2023 saw the implementation of a new governance model at arXiv. arXiv seeks to continually improve the arXiv user experience, make positive changes with transparency, and promote equitable representation within arXiv governance. Work began in 2022 to create the model for a governing body that would put arXiv in a position to modernize, grow, and successfully adapt to change.

New bylaws were created and went into effect in July of 2023, and old governance structures were retired. In 2023, three advisory councils were created to better serve the diverse needs of arXiv: the Editorial Advisory Council, the Science Advisory Council, and the Institutions Advisory Council.

With these new councils in place, the future of governance at arXiv looks bright. This structure will increase effectiveness by streamlining decision-making, foster accountability with clear roles, and elevate opportunities for new voices and ideas by promoting equitable representation that reflects the diversity of the arXiv community.

Editorial Advisory Council

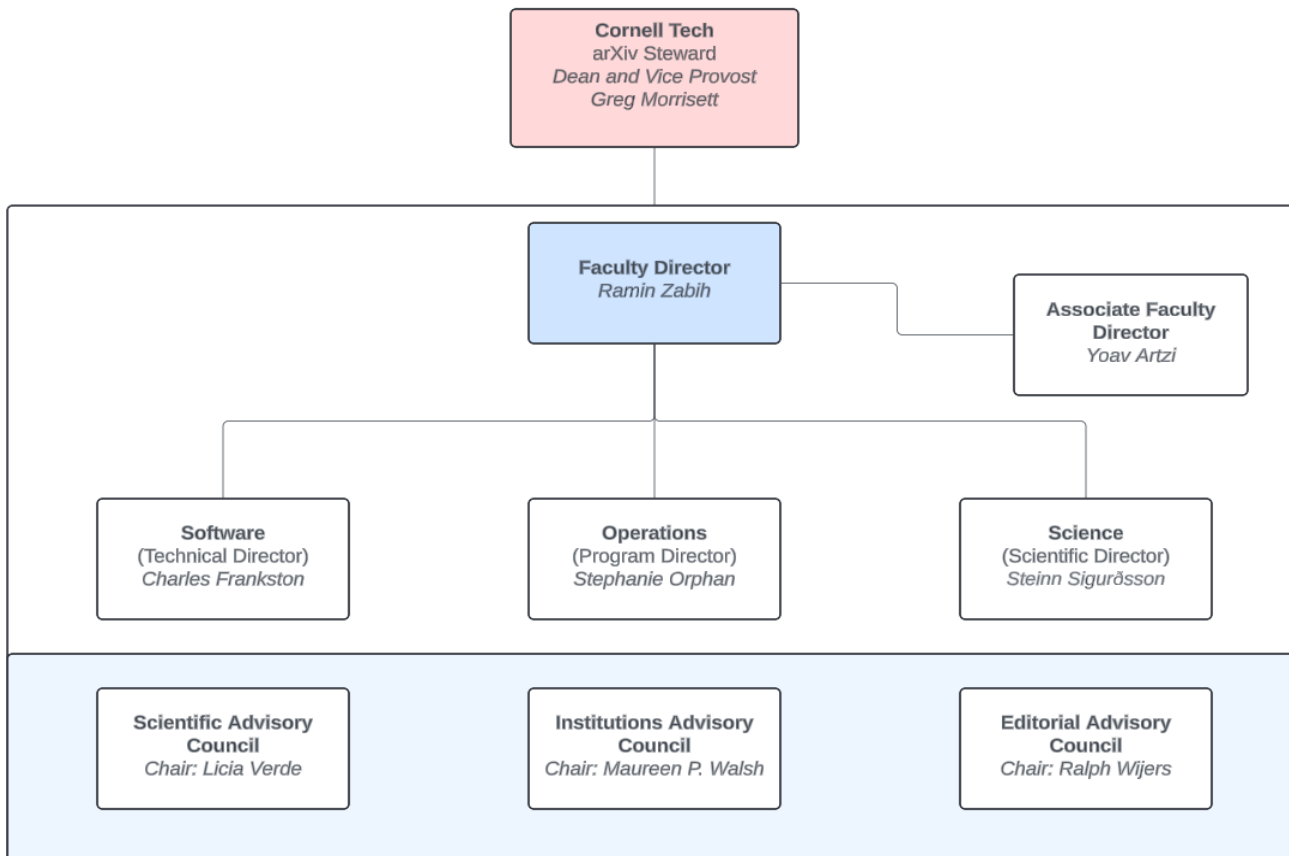
- ▶ Organizes & monitors moderation of arXiv content
- ▶ Advisory Focus: establish standards & procedures for moderation, create & guide Section Editorial Committees
- ▶ Members: Section Editorial Committee chairs

Science Advisory Council

- ▶ Represents the arXiv scientific community
- ▶ Advisory Focus: scientific standards, category management & expansion
- ▶ Members: active researchers who are experts in their field in a senior tenured position

Institutions Advisory Council

- ▶ Represents the arXiv scholarly communications community
- ▶ Advisory Focus: open science, open access, membership, community advocacy
- ▶ Members: individuals associated with an arXiv member organization



Governance in Action

arXiv's new governance structure allows for input from a diverse group of stakeholders and community members, while at the same time streamlining decision-making.

arXiv's three advisory councils operate in parallel and serve complementary roles. Together, the advisory council chairs make up the core of the arXiv Advisory Board, with the faculty director serving as the presiding chair. The Advisory Board and arXiv's councils help advise arXiv's leadership and support the strategic vision for arXiv's future.



2023 was an exciting year for arXiv and the community of member institutions that support it. With a new governance model and three new advisory councils, arXiv is well-positioned for continued success and excellence. I am looking forward to working with our member institutions, and arXiv's Councils, to support the long-term growth and sustainability of arXiv.

—Maureen Walsh, Chair of Institutions Advisory Council and Scholarly Sharing Strategist, Associate Professor, the Ohio State University Libraries

Charting a Course for Operational Excellence

arXiv partners with Invest in Open Infrastructure

While arXiv has been a pioneer in open access for over 30 years, as the landscape of scholarly communications and open research is constantly evolving, so too must arXiv. In 2023, thanks to support from the Simons Foundation, arXiv began work with Invest in Open Infrastructure (IOI) to create a strategic roadmap for arXiv's future, so that arXiv can remain operationally and financially viable, open source, and user-centered.

IOI's mission is to increase adoption of investment in open infrastructure by providing actionable, evidence-based guidance and tools to institutions and funders of open infrastructure. IOI's work with arXiv began in March 2023 and will continue through June 2024.

The main goals of arXiv's partnership with IOI are:

- ▶ Identifying opportunities for sustainable and diversified mission-consistent funding
- ▶ Expanding operational capacity and processes to empower continued growth
- ▶ Designing a robust architecture for community participation and governance



IOI's extensive experience in the open infrastructure space and their expertise in sustainability and governance will help arXiv chart its course for decades to come as it works to serve the research community even better.

**—Ivan Oransky, Special Advisor,
Scientific Publishing at the Simons
Foundation and arXiv Advisory Board
member**

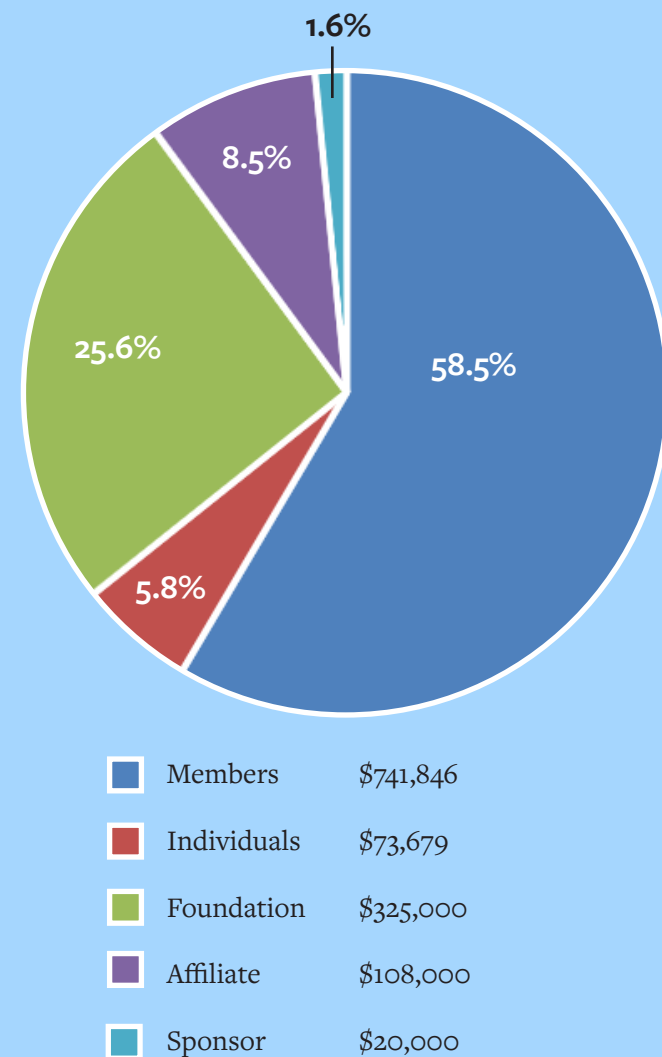
Membership & Donation Report

arXiv's membership program is an important part of arXiv's fundraising and community engagement efforts. While membership has always provided a sizable portion of arXiv's operating budget, in 2020 arXiv restructured its membership program to further bolster its fundraising potential in anticipation of supporting planned infrastructure improvements. In FY22, arXiv launched its updated membership program with a new fee structure, based on institutional submissions. The goal of this structure was to keep membership fees low while increasing the number of institutions in each category.

The benefits of this renewed membership structure are ongoing – overall support in FY2023 totaled \$1,268,525. Membership continues to be a significant funder for arXiv – in FY2023 it made up almost 60% of our overall support.

arXiv's collaboration with SCOSS, the Global Sustainability Coalition for Open Science Services, continued to bolster arXiv's membership as we entered our third and final year of the funding round (FY24) with them. arXiv's initial effort with SCOSS recruited nearly 50 new institutional donors, represented by 10 consortia from across the globe. In FY23, arXiv not only held onto many of these new institutions, but continued outreach with global consortia have brought additional members and gifts through the SCOSS network.

arXiv also participated in our first ever Giving Day with Cornell University in March 2023. Cornell Giving Day supports fundraising efforts across arXiv's parent organization, Cornell University, with dedicated outreach to Cornell students, staff, alumni, and friends. In a single day, arXiv was able to raise \$20K — with one generous donor gifting us pi!



Generous Additional Funding



arXiv is proud and grateful to have received generous additional funding from both the Simons Foundation and the National Science Foundation in 2023. This funding is essential to help arXiv modernize our technology and search functionality, and continue to improve the accessibility of our corpus in the coming years.

Simons Foundation

In 2023, arXiv received a \$5 million gift, to be distributed over three years, from the Simons Foundation. This funding will allow arXiv to migrate to the cloud and modernize our code to ensure reliability, fault tolerance, and accessibility for researchers. A portion of this gift has allowed arXiv to hire software developers whose work will support this tech migration and improvement.



National Science Foundation

In 2023, arXiv received a \$5 million grant from the National Science Foundation (NSF Grant 2311521 | "Frameworks: arXiv as an accessible open access research platform"). Distributed over five years (performance conclusion: 2028) this grant's goal is to create a more discoverable and accessible arXiv to advance scientific innovation. As such, much of this funding goes directly to researchers in Cornell's Computer Science department to support their work creating discoverability tools for arXiv. In addition, direct funding to arXiv from this grant will support continued work in the areas of accessibility in open science.



arXiv.org @arxiv · Oct 20, 2023

The good news is out - arXiv has received \$10 mil in funding & grants from @SimonsFdn & @NSF! 🥳🧬 We are so grateful for this support & the impact it will have on arXiv's ability to grow & continue to serve our #openaccess #science & #research community: tinyurl.com/bd5h9vam



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162



1K



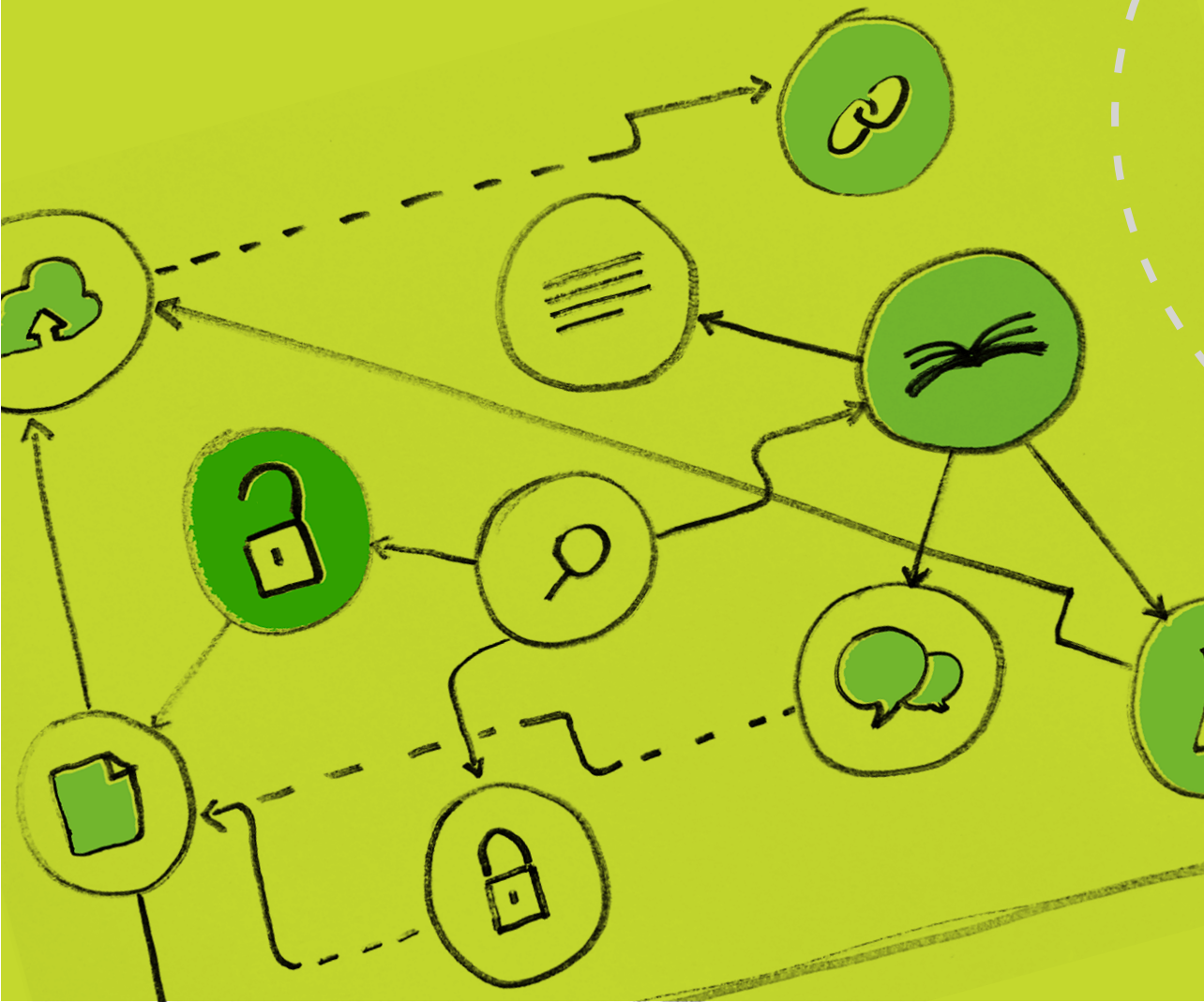
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arXiv in Practice

Stable, fast, built for interoperability

In this section, peek behind the scenes and learn more about the inner workings of arxiv.org. We'll discuss content moderation and user support, as well as our technology update. We'll also give an overview of arXivLabs and arXiv's interoperability goals.



Using arXiv is simple, the tech behind it is not

arXiv in theory is a simple idea – research should be fast, free, and open to all. Every day, arXiv delivers exactly that: cutting edge research available at the click of a button. Researchers start their day turning to arXiv for inspiration, discovery, and seminal papers in their field. arXiv users know – new ideas appear on arXiv first.

arXiv in practice is anything but simple. Researchers trust arXiv not just because we've been a pioneer in open access for over 30 years but because the dedicated team of arXiv staff and volunteers working tirelessly behind the scenes make “arXiv in theory” a reality every day.

The scientific papers researchers share on arXiv are often a culmination of many years of hard work, collaboration among colleagues, failures and successes alike. arXiv staff and volunteers take being entrusted with this body of knowledge seriously, not only making sure that research findings are disseminated quickly so they can be shared broadly, but working diligently to ensure that research is discoverable, properly preserved as part of the scholarly record, and accessible to all.

Researchers put their trust in arXiv not only to share their work but to also be an integral part of the open access ecosystem. It's not just the research results available on arxiv.org that inspire - it's the collaborative, global effort of the entire open science community to collect, protect, and disseminate this knowledge for all.

The arXiv technology, editorial, and user support teams work together to create tools that make sharing and reading research better. In 2023, these teams helped launch the Experimental HTML format across all new papers on arXiv to increase accessibility and support researchers with disabilities. They also worked on arXiv Check, an internal tool to streamline user support and moderation efforts.

Editorial and User Support

arXiv's editorial and user support team curates submissions for moderation and technical standards. In addition to arXiv's scientific director, five staff members and several part-time students balance team resources against scale and speed, as well as quality assurance goals and service goals. This year, seventeen new volunteers joined the existing moderation team, which now totals 205.

Submissions are announced five days a week for nearly the entire year, with small breaks for staff rest and retreat. Even traditional holidays are covered at least partially by staff on a voluntary basis – the show must go on! Each day that papers are announced, new submissions number anywhere between 690 and 1,035. An additional 450 to 1,000 other types of submissions, such as replacements or cross-listings, are also handled by the team.

In a five-year period (2019 – 2023) total submissions to arXiv grew by 33.6%. With this steep submission growth, there is also a corresponding increase in editorial and user support touchpoints, including revisions, rejections, appeals, and author disputes. Increasing submissions also affect moderation, with high paper-to-moderator ratios increasing both the number and length of moderator holds. Many categories on arXiv need additional moderators to handle the increasing volume of submissions.

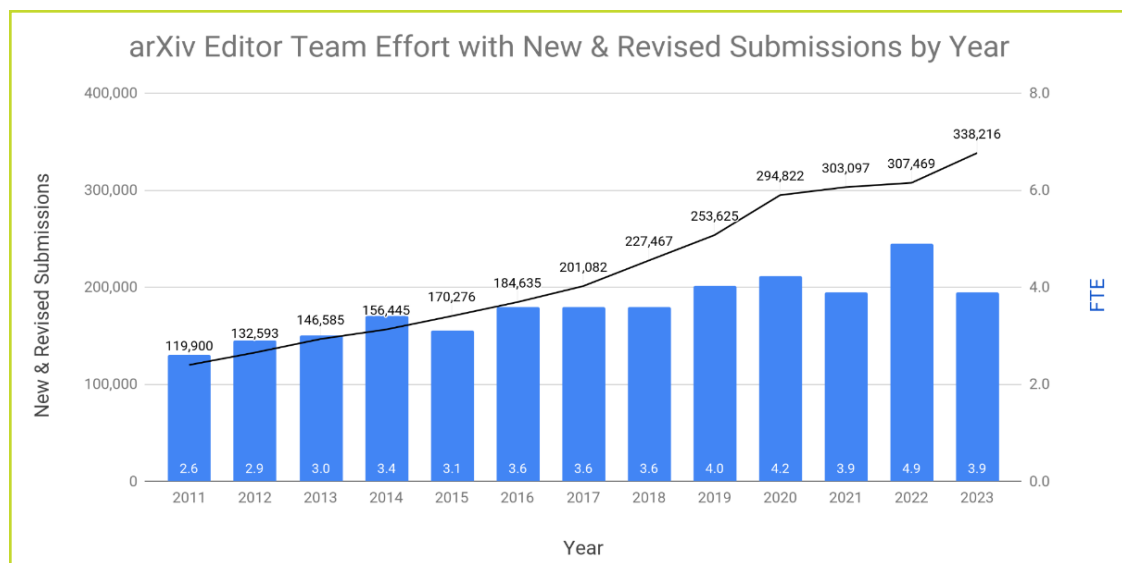
A record-breaking year

Submissions in 2023 broke several records – in May of 2023, arXiv broke 20K new submissions in a single month . . . and less than 6 months later, the record was broken again. In October 2023, arXiv received 20,710 new submissions, and the support team managed over 3K help tickets.

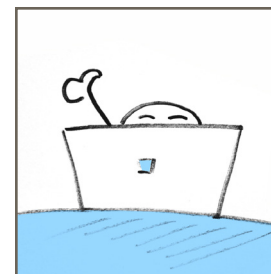
Editorial Team - 2023 at a Glance			
2023 by Month	New Submissions	Help Tickets	Moderator Tickets
January	13,870	1,957	907
February	14,863	2,048	817
March	18,249	2,361	950
April	15,010	2,062	858
May	20,092	2,482	1,024
June	17,848	2,459	873
July	16,897	2,505	1,933
August	16,912	2,750	1,092
September	17,453	2,888	978
October	20,710	3,013	1,125
November	18,841	2,612	1,271
December	17,748	2,437	1,348
Total	208,493	29,574	13,176

To tackle these challenges, 2023 saw the build-out and deployment of a new tool for the editorial and user support team. Work on quality assurance tools through 2023 introduced automation to catch overlap text and concerning words, and these tools will continue to be fine-tuned in 2024. In 2024, arXiv is planning to fully launch arXiv Check, a moderator portal that will further simplify and streamline the editorial process.

Through new moderation and user support tools and smart automation to reduce burden on staff and moderators, arXiv will be better prepared to support submission increases and successfully deliver what arXiv users have come to expect – an open road to fast scientific discovery.

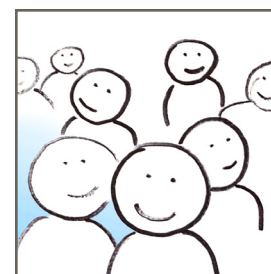


The new moderation interface



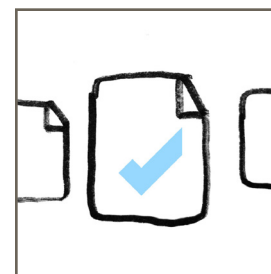
More moderator tools

- ▶ Place and release holds
- ▶ Clearly define work for moderators and editorial team
- ▶ Cut down noise



Easier to work in teams

- ▶ Check mark lets other moderators know what you have looked at
- ▶ Paper lock eliminates accidental overwrites



Modern framework

- ▶ Faster loading
- ▶ Real-time updates
- ▶ Sustainable, flexible codebase



arXiv works due to hundreds of scientists volunteering as moderators, and a small, very committed staff.

—Ralph Wijers, Editorial Advisory Council Chair and Professor of High-Energy Astrophysics at University of Amsterdam

It is so inspiring to see how much the community cares about arXiv. Even in a quickly changing scholarly landscape, arXiv remains the archetype of open access to scientific research.

—Licia Verde, Science Advisory Council Chair and ICREA Professor of Physics and Astronomy at University of Barcelona



In October 2023, arXiv received the most submissions in a single month, ever: 20,710. This shows just how much the scientific community relies on arXiv to share knowledge.

—Steinn Sigurdsson, arXiv Scientific Director and Professor of Astrophysics at Penn State University

Technical Modernization

arXiv has been providing access to research papers since 1991. Today, arxiv.org averages 200,000 hits per hour, 24 hours a day, seven days a week, with most visitors landing directly on abstract pages or PDFs. The service receives 17,300 submissions per month on average and serves over 46 million downloads per month. More than 3 billion articles have been downloaded from arXiv since its inception, and the numbers keep growing.

One of arXiv's main goals as a research-sharing platform is to remain stable, fast, and easy to use so that users can share and discover research quickly and securely. Our small yet mighty development team is tasked with making sure arXiv remains fast, while introducing new technologies to improve user experience, site interoperability, and integration with the scholarly publishing ecosystem.

At the beginning of fiscal year 2023, arXiv welcomed a new technical director, Charles Frankston, to lead and grow arXiv's development team. The 2023 calendar year was the second year of the arXiv-CE ("Cloud Edition") project to move all arXiv services to the cloud. The goal of arXiv-CE is to improve stability and capacity, ease expansion into new subject categories, and allow easier integration with other services. In 2023, the arXiv development team reached its goal of serving all browsing and article downloads from the cloud, and, with a generous in-kind donation of content delivery network services from Fastly, arXiv continues to improve the speed at which researchers across the globe can access arXiv's entire corpus.

Thanks to funding from the Simons Foundation earmarked for technology modernization, arXiv was able to expand its development team in 2023, welcoming three developers, a documentation specialist, and a project manager to help tackle this important project.

arXiv is an essential part of the global scientific community, as is obvious from our continued growth in both submissions and downloads. However, we've reached the limits of the legacy system. By modernizing arXiv's tech stack and moving to the cloud, we can accomodate growth sustainably and improve the arXiv experience for all.

— Charles Frankston, arXiv
Technical Director



Charles Frankston
@arxivcto

arXiv just started a public beta test of our browsing services in the cloud. Everyone is welcome to test browse.arxiv.org where you can browse for recent papers, view abstracts, download PDFs, and search the entire arXiv corpus.

5:28 PM · Jun 26, 2023 · 6,797 Views

arXivLabs

Community Building and Interoperability

arXivLabs is a framework for integrating community-built tools into the arXiv platform. This approach to interoperability allows computer systems to exchange and make use of information on arXiv, which in turn can help researchers more easily navigate scholarly communications to collaborate and make discoveries.

At a quick glance, arXiv is a website where researchers can share and read research articles at the touch of a button, without a paywall. This simple answer is not wrong – and yet arXiv is so much more than what appears on the surface. With more than 2.3 million articles hosted, arXiv represents a vast source of information. The research results, content of the articles, and their metadata can all be accessed by public APIs, which means that articles on arXiv are discoverable across a wide variety of scholarly platforms. arXiv is dedicated to improving and maintaining interoperability to help interconnect scientific communications in a big way.

In 2023, arXivLabs launched four new collaborations on arxiv.org – CatalyzeX Code Finder for Papers, DagsHub, Influence Flower, and TXYZ.AI. At the end of 2023, ar5iv, which was launched as an arXivLabs integration in 2022, was successfully brought “in-house” in the form of arXiv’s HTML Papers Project.

arXivLabs projects to date

- ▶ Bibliographic Explorer
- ▶ Scite Smart
- ▶ Papers with Code
- ▶ Science Cast
- ▶ IArxiv
- ▶ Replicate
- ▶ Hugging Face
- ▶ ar5iv
- ▶ Connected Papers
- ▶ Core Recommender
- ▶ CatalyzeX Code Finder for Papers
- ▶ Influence Flowers
- ▶ DagsHub
- ▶ TXYZ.AI

arXiv in the Community

Inclusive, engaged, leading the way in open science

In this section, discover how arXiv plays a role in the global scientific community. We'll discuss arXiv's identity and brand perception, our work in accessibility, and the importance of outreach, digital communications, and community engagement.



Identity, outreach, and interoperability

Nothing exists in isolation. Research is an increasingly interconnected endeavor, whether it's sharing data and code, collaborating across institutions, or pushing the boundaries of interdisciplinary thinking.

arXiv is all about connecting the dots. We help researchers share research quickly and openly, so they can make new discoveries and collaborate globally. We are a pioneering and integral part of the open access ecosystem, which means we serve as a connection point for many institutions and organizations that champion equitable and open research. We are a community-led resource, and we connect our users' needs to our initiatives through open lines of communication, outreach, and community tool building.

arXiv bridges the gaps between needs, and we continue to ask the big questions: How do we best continue our mission to promote equitable research across the globe? What will the next disruption in academic publishing be, and how will it affect our scientific community? Who will help us elevate the voices of underserved communities and join the dialogue to learn what it really takes to create truly open science, accessible communications, and democratized research for all —

— *is it you?*



Accessibility and arXiv

If open access isn't accessible, is it truly open? arXiv seeks to improve the common good by removing all barriers to scientific research, whether monetary, geographical, or institutional. In 2022, arXiv completed intensive user research with over 40 accessibility experts and members of the arXiv community with disabilities. The results of the research were clear: lack of accessibility is a significant barrier for scientists with disabilities. To create truly open access we need to ensure that research outputs are accessible.

What is our role in making research accessible to all?

- ▶ Ensuring research hosted on arXiv is truly open, regardless of ability
- ▶ Raising awareness of the need for accessible research
- ▶ Centering the voices and needs of researchers with disabilities
- ▶ Highlighting the advantages of accessibility for all - accessible content is better for everyone
- ▶ Continue pursuing big goals to remove barriers to research

“Thank you arXiv. Thank you for listening to blind academics who wanted to gain from your effort over decades.”

— Dr. Jonathan Godfrey, blind
Senior Lecturer in Statistics, Massey University

Accessibility: benefits for all

Keeping accessibility in mind in research outputs reaps huge rewards – accessible research is better for everyone. For example, papers in HTML are better for scientists who rely on assistive technology, work better for machine learning, and mean you can read papers on your mobile phone.



Accessibility Forum 2023

On April 17th, 2023, arXiv hosted a forum to explore how we can make accessible research papers a reality. Speakers joined arXiv from across the globe for the half-day forum to address the challenges researchers with disabilities face. Accessibility experts and researchers with disabilities moderated thoughtful panel discussions on what solutions are available and what steps can be taken by the scientific community now and in the future.



Presentation lineup 2023

- ▶ Keynote – Dr. Jonathan Godfrey: Why is accessibility so essential?
- ▶ Avneesh Singh: The essential role of international standards in accessibility
- ▶ Dr. Cynthia Bennett: When alt text stakes are higher
- ▶ Lukas Nadolskis: Working twice as hard for less information
- ▶ Stacy Scott: Has publishing reached an inflection point?
- ▶ Dr. Patrick Smyth: Hackaccessibility for all
- ▶ Breanne Kisselstein & Anne Logan: Navigating inaccessible academic ecosystems
- ▶ Panel: Digging deeper into image descriptions
- ▶ Panel: Mythbusting the needs of deaf academics
- ▶ Panel: What can authors and publishers do now?

Feedback from the 2023 Forum

“The speakers had so much lived in experience. Every single presenter I wanted to hear more from.”

“The keynote was riveting.”

*“It had never occurred to me that people who are deaf or HOH might only speak ASL and *not* speak English. This has been a revelation to me, which is a little shameful!”*

“I found it very positive to hear from other blind graduate students and beyond about the same challenges I face. I usually don’t hear about the problems that I experience when reading research papers. It can feel isolating when everyone else finds them easy to read.”

Annual Brand Perception Survey

Open lines of communication and feedback are essential to arXiv operating as a trusted community resource. Every year we ask arXiv users to answer a brief survey about how they see arXiv. This annual assessment helps arXiv understand how we are perceived by our users and the global scientific community. It also helps arXiv track how this sentiment may be changing over time.

In our Annual Brand Perception Survey (BPS), we ask community members how closely they associate arXiv with ten crucial attributes. In 2023, we received over 1,800 responses in 48 hours. Thank you to all who took the survey!

Scores remained stable over the past three years – in our lowest-scoring categories of Welcoming and Innovative, we plan to track whether our ongoing tech modernization, as well as our global outreach initiatives, will move the needle on these in 2024.

Attribute	2020	2021	2022	2023
Open	91	91	88	88
Stable	84	83	82	81
Fair	70	71	69	70
Easy-to-use	70	70	69	68
Satisfying	70	70	67	66
Transparent	68	69	66	66
Trustworthy	-	60	59	58
Empowering	54	58	59	56
Welcoming	53	52	52	50
Innovative	39	40	40	38

Multiyear tracking
of BPS results

arXiv continues to be highly rated in both Openness and Stability, important core tenets for sustainable growth and community engagement.

Open 88	Stable 81	Fair 70
Easy-to-use 68	Satisfying 66	Transparent 66
Empowering 56	Trustworthy 58	Welcoming 50
Innovative 38		

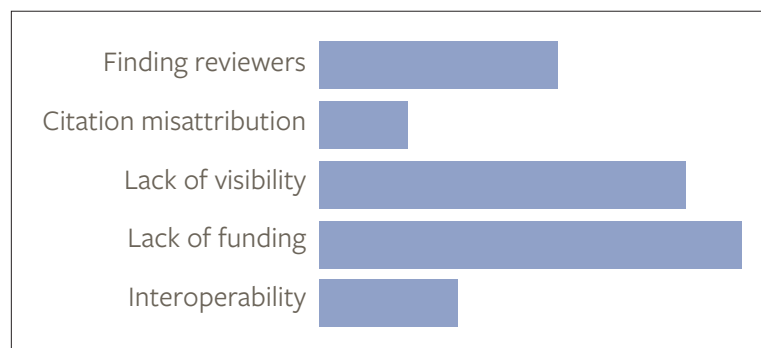
Overlay Journals

Every year, we include a few survey questions to solicit feedback on trends and initiatives of relevance to the global scientific community. This year, we asked respondents: “Have you heard of overlay journals?” A large majority (75% of respondents) had never heard of overlay journals, with only 14% of respondents positively affirming their knowledge of overlay journals. For respondents who were introduced to the concept of overlay journals through this survey, 65% felt they would positively contribute to peer review, open science, and scholarly communications.

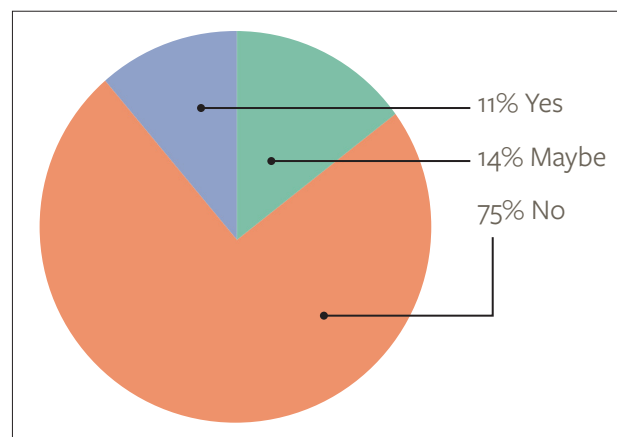
arXiv also conducted direct research with overlay journal editors and managers to better understand their pain points. Lack of funding was the most cited pain point, followed by lack of visibility and its intertwined effect on journal reputation. Other frequently cited points include the need for more interoperability to enrich metadata, the challenges of finding and organizing reviewers, and citation misattribution.

Overlay journals are non-traditional journals which curate and add peer review to preprints held in open repositories (such as arXiv). In effect, they “overlay” peer review on top of preprint hosting services, greatly reducing their operational costs and allowing them to focus on their core service.

Pain points for overlay journal editors



Survey: Have you heard of overlay journals?



arXiv in the World: Outreach and Brand

Researchers wake up with arXiv. More than simply a utility or a digital repository, arXiv is a trusted brand that is integrated into the daily lives and work of researchers across the globe. Thanks to the strengthening of arXiv's brand in previous years, arXiv is positioned to better support our scientific community by acting as a thought leader in the open research ecosystem and an advocate for researchers and the global scientific community at large.

As a community-led organization, maintaining avenues for open dialogue is essential. Through arXiv's social media outreach, we are able to engage with arXiv users directly and be transparent about operational issues, changes to arxiv.org, and leadership decision-making. Our social media presence also allows us to keep our finger on the pulse of the changing scholarly communications ecosystem.

arXiv is active on X (formerly Twitter) and launched our LinkedIn channel in October of 2023. With over 35,000 followers between both channels, arXiv users are actively seeking out ways to join the discussion with arXiv.



X (formerly Twitter)

- ▶ Launched December 2016
- ▶ 34.4K followers
- ▶ 20% follower growth YOY



LinkedIn

- ▶ Launched October 2023
- ▶ 1K follower increase in <6 months



arXiv.org @arxiv · Oct 27, 2023

There are 3 days left of [#OAWEEK](#) & [#givingweek](#) & we want to know how important arXiv is to you? Reply below to say nice things & celebrate [#openaccess](#)! 🙌🎉📢 If you want to support arXiv & [#openscience](#), consider sharing your thoughts & donating here: tinyurl.com/ihe



Open Access Needs

We believe that open access research is essential for scientific advancement and a cornerstone of the global scientific community. arXiv has been a pioneer of #openaccess for over 20 years, but we can't do it alone.

The world needs open access, and open access research is essential for scientific advancement. Our mission is to make science accessible and free to all. Open access is not free.

Donate today and your gift goes directly to supporting arXiv's infrastructure, new initiatives, and our mission: open access for all.

Conferences and Events

Digital and in-person events are opportunities for arXiv to keep the conversation going. Whether hosting, attending, or exhibiting, arXiv “out in the world” at conferences and events is another avenue for arXiv to support the scientific community, showcase the arXiv staff and volunteers, network with collaborative institutions, and engage users with the arXiv brand in person.

In October 2023, arXiv celebrated International Open Access Week by hosting an online panel in collaboration with Cornell University Libraries. As a member of the SCOSS family of open infrastructures, arXiv educated the public on open access within the theme “Community of Commercialization” and created a petition for the community to show their support for open access and arXiv. The petition received over 1,000 signatures and over 450 comments from researchers on why they love arXiv and how it supports their work.

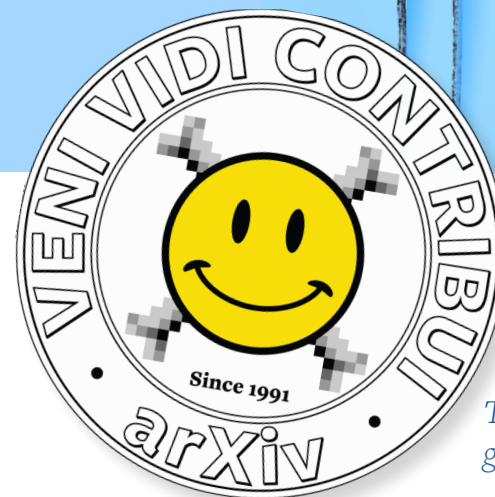
arXiv attended the 3rd United Nations Open Science Conference in February to share our voice on equity in open scholarship and reforming scientific publishing. arXiv was excited to exhibit for our second time at the (US) National Society of Black Physicists Annual Conference in Tennessee to support the development and professional well-being of African-American physicists and physics students. In 2023, arXiv exhibited for the first time at the American Geophysical Union Annual Meeting in California, a conference with over 25,000 attendees, to introduce the arXiv brand to new researchers, network with our colleagues at NASA, and assess the need for category expansion.



arXiv.org @arxiv · Feb 10, 2023
arXiv program director, Stephanie Orphan, is at #OpenScienceUN this week. So many important discussions happening here.



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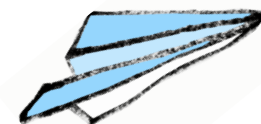
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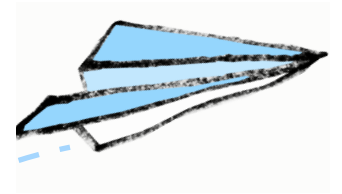
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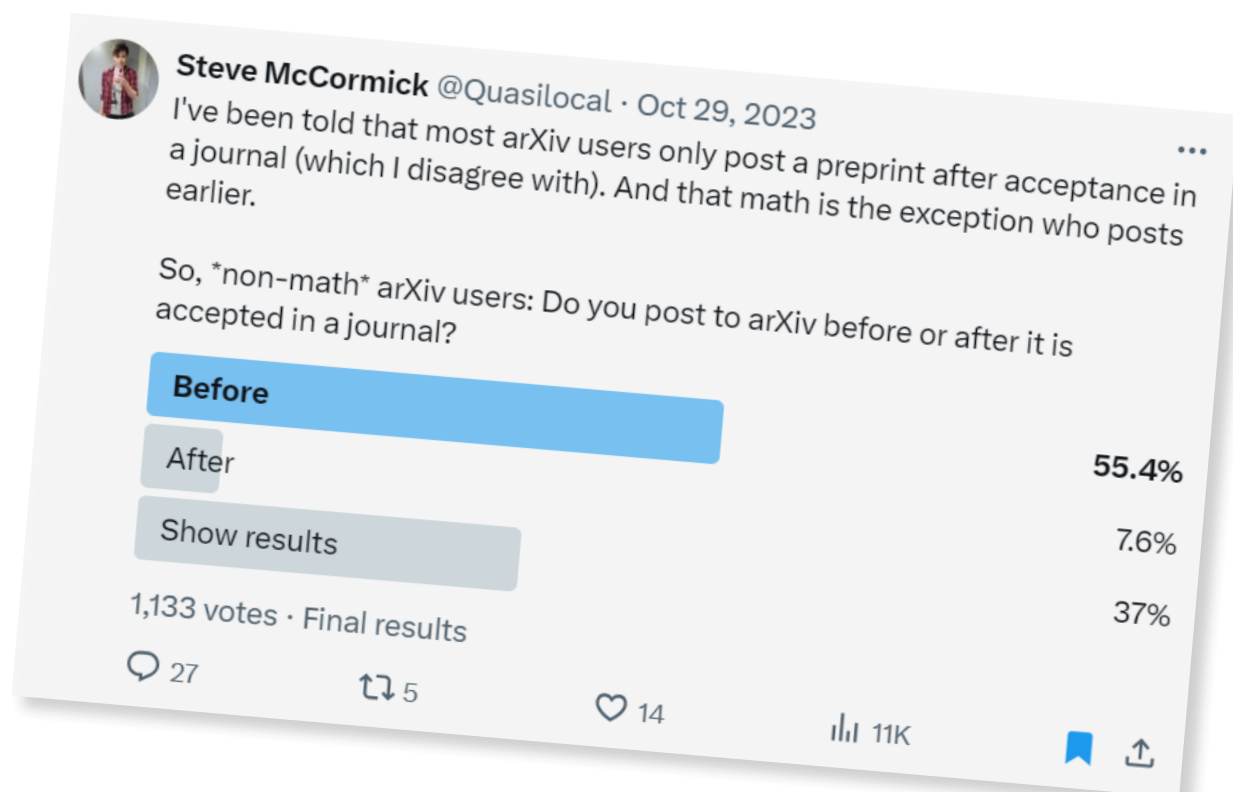
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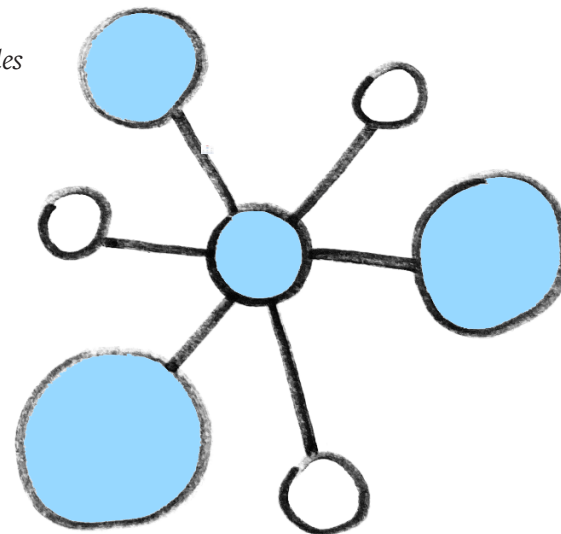
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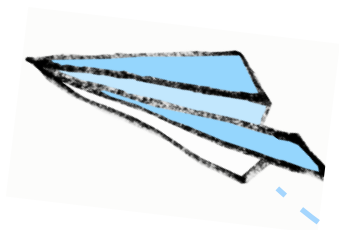
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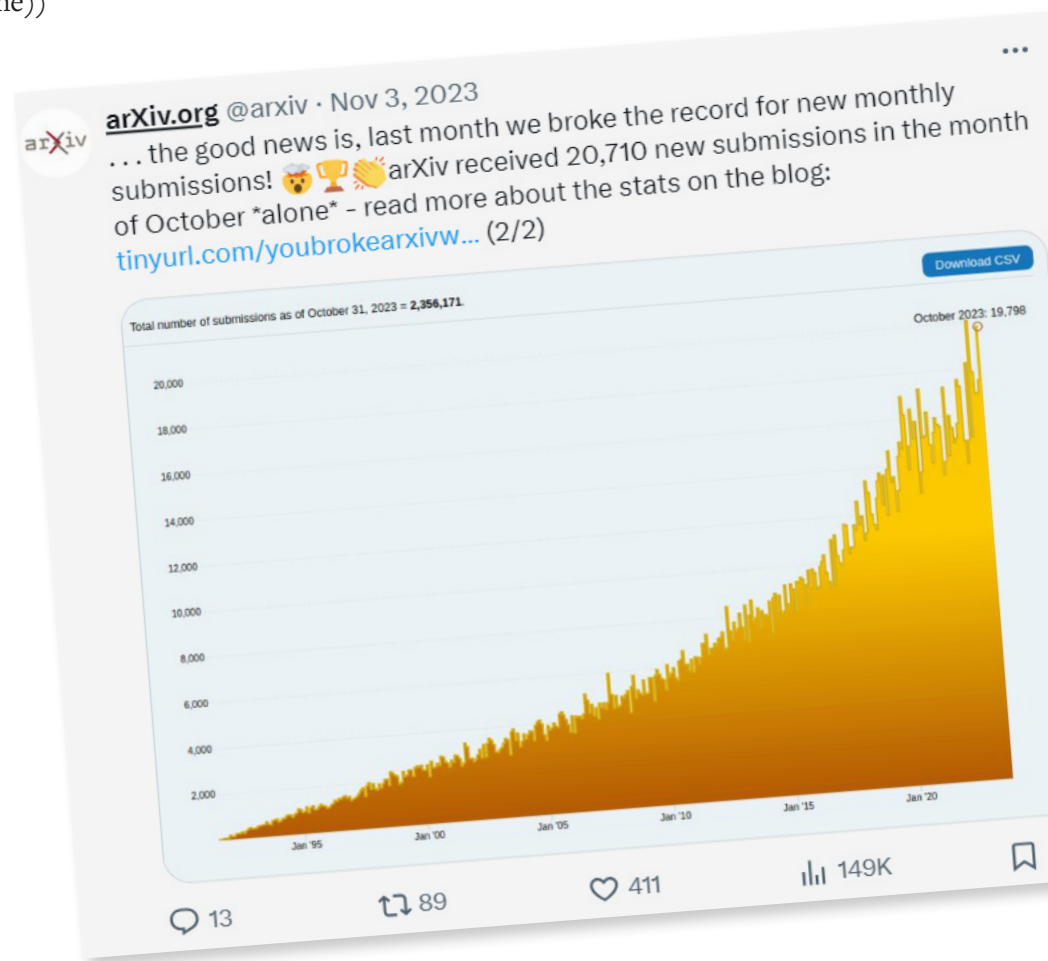
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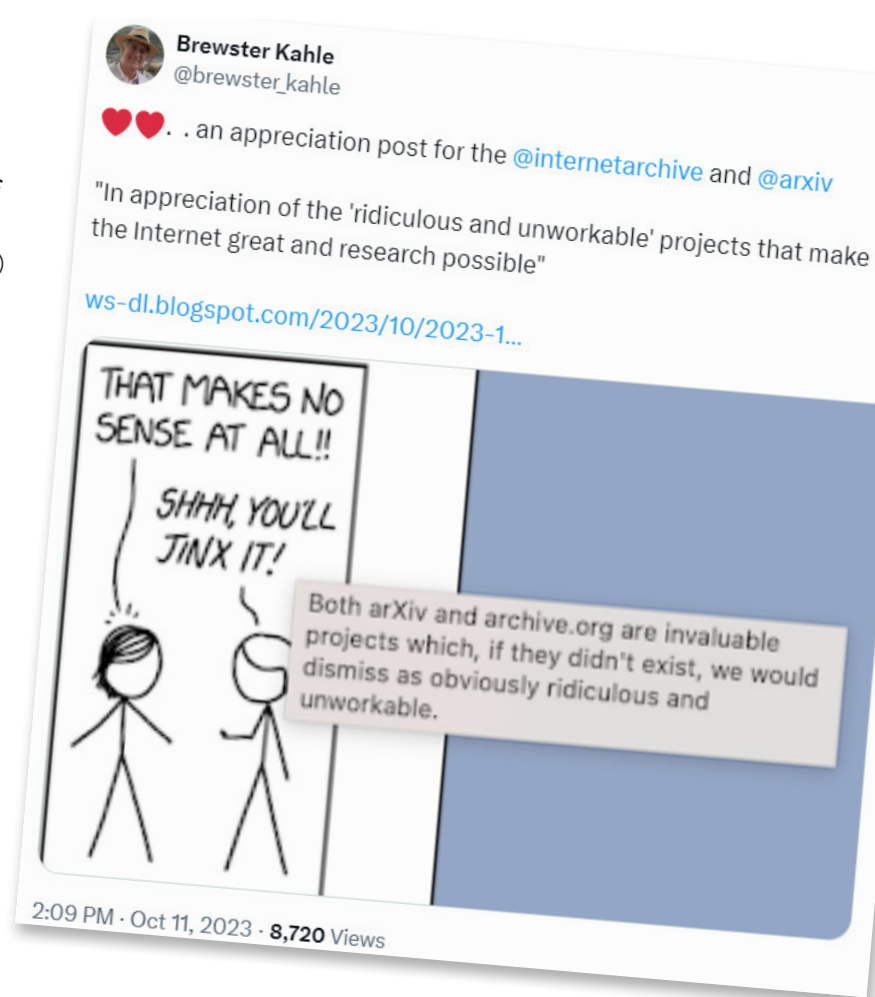
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Guodong Shi (The University of Sydney)
Yuan Wang (Florida Atlantic University)

Mathematics

Marton Balazs (University of Bristol)
Jozsef Balogh (University of Illinois)
Dmitriy Bilyk (University of Minnesota)
Harold Boas (Texas A&M University)
B. M. Brown (Cardiff, University of Wales)
Gilles Carron (University of Nantes)
Bill Casselman (University of British Columbia)
Ioana Dumitriu (University of California, San Diego)
Paul Fendley (University of Oxford)
Riccardo Ferrari (TU Delft)
Jim Fowler (The Ohio State University)
Angela Gibney (Rutgers University)
Paul E. Gunnells (University of Massachusetts)
Robert Guralnick (University of Southern California)
Mark Hovey (Wesleyan University)
Daan Huybrechs (KU Leuven)
Herbert Koch (Universität Bonn)
Greg Kuperberg (University of California, Davis)
Krystyna Kuperberg (Auburn University)
Anthony Licata (Australian National University)
Marco Lovera (Politecnico di Milano)
Rafe Mazzeo (Stanford University)
William McCallum (University of Arizona)
William J. Mitchell (University of Florida)
Nilima Nigam (Simon Fraser University)
Mikhail Ostrovskii (St. John's University)
Grigorios Paouris (Texas A&M University)
Victor Reiner (University of Minnesota)

Marc A. Rieffel (University of California, Berkeley)
Guodong Shi (The University of Sydney)
Anurag K. Singh (University of Utah)
Christopher Sogge (Johns Hopkins University)
Stefan Steinerberger (University of Washington, Seattle)
Jason Swanson (University of Central Florida)
Gordana Todorov (Northeastern University)
Yuan Wang (Florida Atlantic University)
Larry Wasserman (Carnegie Mellon University)
Martin Wells (Cornell University)
Andrew Zucker (University of Waterloo)

Physics

Gonzalo Alonso-Álvarez (University of Toronto)
Shin'ichiro Ando (University of Amsterdam)
Imre Bartos (University of Florida)
Andrew Benson (Carnegie Institution for Science)
Tanmoy Bhattacharya (Los Alamos National Laboratory)
Turan Birol (University of Minnesota)
Steve Blair (University of Utah)
Antia Botana (Arizona State University)
Patrick (Jojo) Boyle (McGill University)
Michele Ceriotti (École Polytechnique Fédérale de Lausanne)
Igor Chilingarian (Harvard-Smithsonian Center for Astrophysics)
Debashish Chowdhury (Indian Institute of Technology, Kanpur)
Jim Cline (McGill University)
Ronald Cohen (Carnegie Institution for Science)
John Conway (University of California, Davis)
Csaba Csaki (Cornell University)
Matthew Davis (The University of Queensland)
Jacques Distler (University of Texas at Austin)
Vladimir Dmitriev (Budker Institute of Nuclear

Physics)
Robert G. Edwards (Jefferson Lab)
Paul Fendley (University of Oxford)
Victor Galitski (University of Maryland, College Park)
Peter Gallagher (Dublin Institute for Advanced Studies)
Giovanni Gallavotti (Universita' di Roma, La Sapienza)
Daniel Gottesman (University of Maryland)
David G. Grier (New York University)
Paolo Grigolini (University of North Texas)
Niels Gronbech-Jensen (University of California, Davis)
Gregory W. Hammett (Princeton Plasma Physics Laboratory)
Jarmo Hietarinta (University of Turku)
Tin-Lun "Jason" Ho (The Ohio State University)
Kenneth Intriligator (University of California, San Diego)
Michel Janssen (University of Minnesota)
Robert Janssens V. F. (University of North Carolina at Chapel Hill)
Xun Jia (Johns Hopkins University)
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Resmi Lekshmi (Indian Institute of Space Science and Technology)
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David T. Limmer PhD (University of California, Berkeley)
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Thomas Moeller (TU Berlin)
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 Marcello Porta (SISSA)
 Jorge Portoles (IFIC/CSIC - University of Valencia)
 Yuri Ralchenko (NIST)
 Susan Ramlo (University of Akron)
 Christopher S. Reynolds (University of Maryland)
 Robert Ryne (LBNL)
 Andreas Schadschneider (Universitaet zu Koeln, Institut fuer Theoretische Physik)
 Robert Seiringer (Institute of Science and Technology Austria)
 Frank Simon (Max-Planck-Institut fuer Physik)
 Jonathan Squire (University of Otago)
 Michael Stone (University of Illinois)
 Yiyang Sun (Syracuse University)
 Lev Vaidman (Tel Aviv University)
 Dimitri Veras (University of Warwick)
 John Wettlaufer S (Yale University)
 Ralph Wijers (Anton Pannekoek Institute for Astronomy, University of Amsterdam)
 Peter Williams (Center for Astrophysics Harvard

& Smithsonian)
 Diego Yankelevich (University of California, Davis)
 Rena Zieve (University of California, Davis)

Quantitative Biology

Adriano Barra (Sapienza University of Rome)
 Ralf Bundschuh (The Ohio State University)
 Carson C. Chow (National Institutes of Health)
 Sara Del Valle (Los Alamos National Laboratory)
 Andrew Mugler (Department of Physics and Astronomy, University of Pittsburgh)
 Richard A Neher (University of Basel)
 Luca Peliti (Santa Marinella Research Institute)
 Dave Thirumalai (University of Texas at Austin)
 Ned S. Wingreen (Princeton University)

Quantitative Finance

Arthur M. Berd (General Quantitative, LLC)
 Lisa Borland (Evnine & Associates, Inc)
 Jean-Philippe Bouchaud (CFM & Academie des Sciences)
 Rama Cont (University of Oxford)
 Peter Forsyth (University of Waterloo)
 Lisa Goldberg (University of California, Berkeley)

Nigel Goldenfeld (University of California, San Diego)
 Alexander Lipton (MIT)
 Marcel Nutz (Columbia University)
 Dmitry Rakhlin (Goldman Sachs)
 Barry Schachter (Gloria-Mundi, LLC)
 A. Christian Silva (idatafactory)
 Gilles Zumbach (Edgelab)

Statistics

Elena Erosheva (University of Washington)
 Susan Holmes (Stanford University)
 Shane Jensen (The Wharton School, University of Pennsylvania)
 Leo Lahti (University of Turku)
 Elizabeth L. Ogburn (Johns Hopkins University)
 Aaditya Ramdas (Carnegie Mellon University)
 Zoltan Szabo (London School of Economics and Political Science)
 Larry Wasserman (Carnegie Mellon University)
 Martin Wells (Cornell University)



Thank you!



Cornell Tech
2 W Loop Rd
New York, NY 10044



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