YEAR OF OPEN SCIENCE

CULMINATING CONFERENCE
MARCH 21-22, 2024

CONVENED BY

COS
CENTER FOR
OPEN SCIENCE

Welcome to the Year of Open Science Culminating Conference

To showcase the outputs, coalition-building, and ongoing work from the 2023 Year of Open Science (YOS), the Center for Open Science (COS), with support from NASA, presents an online culminating conference bringing together the YOS participating organizations and other research stakeholders, including U.S. federal agencies, funders, international policy makers, universities, and research institutions to exchange experiences, ideas, and expertise, and share specific recommendations for advancing open science policies and practices.

The 2023 Year of Open Science inspired stakeholders to make progress on the following four key goals:

1. Develop a strategic plan for open science
2. Improve the transparency, integrity, and equity of reviews
3. Account for open science activities in evaluations
4. Engage underrepresented communities in the advancement of open science

The culminating conference features a combination of plenary sessions and panel discussions, lightning talks to showcase a range of key initiatives, and reports from organizations involved in advancing open science initiatives, highlighting successes and challenges.

Conference Theme: Embracing the Future: Open Science in the U.S. Federal Context and Beyond

Key Conference Goals:

1. Showcase the past, present, and future of open science initiatives with relevance to U.S. federal agencies and international partners
2. Highlight synergistic connections across the web of stakeholders who enact and support open science initiatives across the research lifecycle
3. Promote systems thinking by illuminating and connecting activities across the major components of the research system: technology infrastructure, community-building, rewards and incentives, and policy making and implementation
4. Foster a warm and welcoming environment for all community members to have opportunities to contribute
5. Offer a dynamic and interactive event with the chance to forge new connections

The program is organized around four focal topics:

1. Infrastructure, Tools, and Technology
2. Community-Building
3. Rewards and Incentives
4. Policy

Schedule At-A-Glance

Thursday, March 21, 2024

11:00 am – 12:20 pm ET	**Reflections on a Year of Open Science: Initiatives and Achievements Realized and Where to Next – (OSTP, NASA, UNESCO) – Plenary A**			
12:30 pm – 1:20 pm ET	Invited Session A (Infrastructure)	Session A (Policy)	Invited Session B (Policy)	Invited Session C (Policy)
1:30 pm – 2:20 pm ET	Session B (Infrastructure)	Session C (Community, Infrastructure, Policy)	Invited Session D (Policy)	Invited Session E (Policy)
2:30 pm – 3:50 pm ET	**The Critical Roles of Grassroots Initiatives and Communities in Increasing the Adoption of Open Science Practices – (OSPO++, neuromatch, GOSH, PREreview) – Plenary B**			
4:00 pm – 4:50 pm ET	Session D (Community)	Session E (Infrastructure)	Lightning Talks A (Data Sharing)	Org. Stories A (Community)
5:00 pm – 5:50 pm ET	Session F (Infrastructure)	Session G (Infrastructure)	Lightning Talks B (Metascience)	Org. Stories B (Rewards)

Friday, March 22, 2024

8 am – 8:50 am ET	**Advances in Research Evaluation: Large-Scale Efforts in the US and Worldwide – (HELIOS, CoARA, DORA) – Plenary C**			
9 am – 9:50 am ET	Session H (Policy)	Session I (Rewards)	Lightning Talks C (Physical Sciences)	Org. Stories C (Community)
10 am – 10:50 am ET	Session J (Community)	Session K (Infrastructure)	Lightning Talks D (Rewards & Infrastructure)	Org. Stories D (Infrastructure)
11 am – 12:20 pm ET	**Ongoing Activities to Advance Open Science at US Federal Agencies Following the Launch of a Year of Open Science – (NSF, NIH, DOE) – Plenary D**			
1:30 pm – 2:20 pm ET	Session L (Infrastructure)	Session M (Community)	Lightning Talks E (Metascience)	Org. Stories E (Policy)
2:30 pm – 3:20 pm ET	Session N (Infrastructure)	Lightning Talks F (Replication)	Lightning Talks G (Equity, Training, Norms)	Lighting Talks H (Publishing)

Session Details

Session Type	Description
Plenary and Invited Sessions	50 to 80 minute sessions that highlight the past, present, and future of open science across the research lifecycle. Sessions are themed around infrastructure, community building, rewards, and policy.
Session	50-minute sessions (e.g., presentations, panels, symposia, discussions) that delve into specific topics related to open science
Lightning Talk Sessions	Collections of brief, dynamic presentations (10 minutes each) that provide quick insights, updates, or showcase innovative projects aligned with the conference theme
Organizational Stories of Successes and Challenges	Groups of organizations share their experiences, successes, and challenges in their projects with particular attention to the four NASA Year of Open Science Goals (12 minutes each)

Plenary A - Reflections on a Year of Open Science: Initiatives and Achievements Realized and Where to Next

Presenters: Ana Persic (UNESCO), Maryam Zaringhalam (OSTP), Chelle Gentemann (NASA)
Moderators: Lisa Cuevas Shaw (Center for Open Science), Alison Parker (The Wilson Center)

In January 2023, the White House Office of Science and Technology Policy (OSTP) declared 2023 to be a Year of Open Science (YOS) to celebrate the benefits and successes of open science and inspire more scientists to adopt open science practices. Seventeen federal agencies, a coalition of universities, and other intergovernmental bodies and organizations in the U.S. and internationally coalesced around this initiative to accelerate momentum alongside key policy shifts. The YOS declaration follows the global commitment to open science made by United Nations member states through the adoption of UNESCO's Recommendation on Open Science in late 2021. This opening plenary brings together representatives from UNESCO, OSTP, and NASA to share highlights of initiatives and achievements realized during the YOS and to foster discussion about ongoing opportunities and challenges in the global coordination of science reform movement. Speakers will offer insights into where UNESCO, OSTP, and NASA are continuing to invest in and ramp up efforts and answer questions in this moderated panel-style session.

Plenary B - The Critical Roles of Grassroots Initiatives and Communities in Increasing the Adoption of Open Science Practices

Presenters: Jacob Green (OSPO++), Nick Halper (neuromatch), Brianna Johns (Gathering for Open Science Hardware), Daniela Saderi (PREreview)
Moderator: Emmy Tsang (Invest in Open Infrastructure)

While top-down actions, e.g. policy development and research assessment reforms, are important for advancing open science, community-driven, bottom-up initiatives play a critical role in increasing the adoption of open science practices, by bringing together more diverse perspectives and ideas and empowering individuals to actively drive and lead the cultural change in their communities. This panel discussion explores the pivotal roles of grassroots open science communities in broadening participation and fostering collaboration, innovation, and inclusivity within research. Panelists representing 4 initiatives in different areas of open science will share insights, challenges, and successes in advancing open science principles from the ground up.

Plenary C - Advances in Research Evaluation: Large-Scale Efforts in the US and Worldwide

Presenters: Eva Méndez (CoARA), Caitlin Carter (HELIOS), Haley Hazlett (DORA)
Moderator: Brian Nosek (Center for Open Science)

Ten years after the publication of the Declaration on Research Assessment (DORA), the movement to reform research assessment is accelerating and maturing internationally. This session will focus on large-scale efforts happening in the U.S. and worldwide. Emerging from the work of the National Academies of Science and Engineering "Roundtable on Aligning Incentives for Open Scholarship," the Higher Education Leadership for Open Science (HELIOS Open) initiative is bringing together leaders from top colleges and universities in the U.S. to advance rewards and recognition for engaging in open scholarship practices. Internationally, the Coalition for Advancing Research Assessment (CoARA) is likewise leading the charge to focus research evaluation on qualitative judgments that avoid overreliance on problematic metrics and recognizes diverse research contributions across the research lifecycle. This session brings together representatives from HELIOS Open, CoARA, and DORA to foster a discussion about research evaluation in the U.S. and global contexts, highlighting the complementary roles of the two initiatives. The session will also address gaps in the research evaluation landscape to surface areas where action is needed to bring research evaluation reforms to fruition.

Plenary D - Ongoing Activities to Advance Open Science at US Federal Agencies Following the Launch of a Year of Open Science

Presenters: Martin Halbert (NSF), Susan Gregurick (NIH), Brian Hitson (DOE)
Moderator: Chris Erdmann (SciLifeLab)

Starting in 2023, the White House Office of Science and Technology Policy (OSTP) launched a Year of Open Science with the goal of advancing open, equitable, and secure research. Federal agencies engaged a wide range of communities including students, researchers, universities, private companies, libraries, and foundations. They organized their activities around five key themes:

- Strengthening Open Science Policies
- Investing in Open Science Infrastructures
- Supporting the Research Community in Building Open Science Skills
- Engaging Communities to Broaden Participation in Open Science
- Promoting Incentives for Open Research Practices

This session brings together representatives from three agencies, the National Science Foundation (NSF), National Institutes of Health (NIH), and Department of Energy (DOE), to highlight and discuss their ongoing activities in relation to the Year of Open Science and their roadmaps to enhancing public access to the results of supported research in response to the 2022 White House OSTP Memo (which called for immediate public access to federally funded research results and data). The agencies will also discuss how the community can learn about their open science related activities, stay informed, and engage with them.

Invited Session A (Infrastructure) - Open Science Plumbing: Infrastructure Enabling and Catalyzing Policy Implementation

Presenters: Amanda French (ROR), Jennifer Gibson (Dryad), Ishwar Chandramouliswaran (NIH), Tim Vines (DataSeer)
Moderator: Nici Pfeiffer (Center for Open Science)

The research culture shift towards open research practices is a social change best met with a systems approach that ensures the interdependent components of infrastructure, training, community norms, incentives, and policy requirements. Each of these interdependent components is necessary, and each is insufficient on its own to shift the research culture. In this dialog session, we will introduce the problem of changing an entire culture and technology solutions that are catalyzing change, while welcoming questions and use cases from event participants.

Invited Session B (Policy) - The Future of Open Science Policy: Community Engagement in Research & Data

Presenters: Emelia Williams (Open Environmental Data Project), Katie Hoeberling (Open Environmental Data Project), Jeff Sheehy (Healthcare Consultant), Grace Wickerson (Federation of American Scientists)
Moderator: Grace Wickerson (FAS)

Affected communities hold key insights that are critical to understanding and addressing complex environmental, social, and health challenges. Effectively engaging these communities requires going beyond making the outputs of science accessible. Instead, it calls for forging meaningful partnerships that span the research process, from idea conception to data interpretation, in order to create a more equitable scientific enterprise and policy ecosystem. The Year of Open Science reaffirmed the vital role of government actors in supporting open and inclusive science. To help build on that momentum, the Federation of American Scientists partnered with the Center for Open Science and the Wilson Center to run an Open Science Policy accelerator aimed at advancing new, ambitious policy ideas. In this session, participants from the accelerator will discuss innovative approaches that the U.S. government could take to foster community engagement in science. Their proposals aim to both enhance the inclusivity of scientific research and to ensure that federal policies are grounded in diverse perspectives and real-world contexts.

Invited Session C (Policy) - The Future of Open Science Policy: Open Source Scientific Hardware

Presenters: Shannon Dosemagen (Open Environmental Data Project), Alison Parker (Wilson Center Science and Technology Innovation Program), Michael Weinberg (NYU Engelberg Center on Innovation Law & Policy), Alicia Gibb Seidle (Open Source Hardware Association)
Moderator: Alison Parker (The Wilson Center)

The growth of an open source ethos within the scientific community represents a shift towards more collaborative, transparent, and efficient research infrastructure. Open source hardware — publicly accessible technology designs that can be freely used, modified, and distributed — has the potential to revolutionize how scientific tools are developed and utilized. It also provides the government with a unique opportunity to align its public good–oriented mission with its funding and procurement of scientific infrastructure. The Year of Open Science reaffirmed the vital role of government actors in supporting open and accessible science. To help build on that momentum, the Federation of American Scientists partnered with the Center for Open Science and the Wilson Center to run an Open Science Policy accelerator aimed at advancing new, ambitious policy ideas. In this session, participants from the accelerator explore the potential of open source hardware policies to democratize scientific inquiry, reduce costs, and foster a culture of shared knowledge across scientific domains. These recommendations highlight the potentially transformative impact of integrating open source hardware into federal policies and processes.

Invited Session D (Policy) - The Future of Open Science Policy: Transparency Across the Research Lifespan

Presenters: Jessica Polka (Astera Institute), Brendan Nyhan (Dartmouth College), Sean Grant (HEDCO Institute for Evidence-Based Educational Practice, University of Oregon), David Mellor (Center for Open Science), Jordan Dworkin (Federation of American Scientists)
Moderator: David Mellor (COS)

Making the outputs of federally funded research transparent and publicly accessible is a central goal of the U.S. government's open science initiatives. Yet these outputs represent only the final stage of the research life cycle, while earlier stages — including proposal development, protocol planning, project implementation, and peer feedback — often remain closed off to the community, the public, and decision-makers. Increasing the transparency of these key components of the scientific process could be transformative. The Year of Open Science reaffirmed the vital role of government actors in supporting open and transparent science. To help build on that momentum, the Federation of American Scientists partnered with the Center for Open Science and the Wilson Center to run an Open Science Policy accelerator aimed at advancing new, ambitious policy ideas. In this session, participants from the accelerator discuss policies and initiatives to advance openness across the research lifespan. Exploring ideas of openness in research methodology, peer review, grant applications, and data sharing, these recommendations highlight the power of cross-cutting transparency to help lay a stronger foundation for evidence-based policy and scientific advancement.

Invited Session E (Policy) - The Future of Open Science Policy: Security of Open Science Software & Data

Presenters: Johanna Cohoon (University of Utah), James Howison (University of Texas at Austin), Karthik Ram (UC Berkeley & rOpenSci), Alyssa Columbus (Johns Hopkins University), Sayeed Choudhury (Carnegie Mellon University)
Moderator: Jordan Dworkin (FAS)

As science evolves, software and data are becoming increasingly critical pillars for progress. Yet the infrastructure supporting these models is likely to encounter the dual challenge of maintaining openness while safeguarding against security threats and privacy concerns. Managing this delicate balance is crucial for enhancing the trust and efficacy of scientific research. The Year of Open Science reaffirmed the vital role of government actors in supporting open and secure science. To help build on that momentum, the Federation of American Scientists partnered with the Center for Open Science and the Wilson Center to run an Open Science Policy accelerator aimed at advancing new, ambitious policy ideas. In this session, participants from the accelerator discuss policy levers for strengthening the technological underpinnings of open science. The recommendations highlight the need for mapping and supporting key infrastructures, creating mechanisms for rapidly responding to threats, and ensuring robust standards and guidelines for protecting sensitive information.

Session A - Data Sharing and the Impact of Publisher-Led Policy, Intervention, and Training: An Overview of Lessons Learned from Springer Nature

Presenters: Graham Smith (Springer Nature), Erika Pastrana (Springer Nature), Patrick Goymer (Nature Ecology & Evolution)
Theme: Policy

As a proactive partner to the research community, Springer Nature is pioneering new approaches to open data sharing and supporting the growing requirements of funders' open science policies and the needs of different research communities. Open Science must go beyond policy to practice in order to

effect meaningful change. Springer Nature has already mandated the inclusion of data availability statements on over a thousand journals and is working to extend this to its entire portfolio. But we know from hard-won experience that this isn't enough and so are working to go beyond mandates to encourage more sharing by making sharing easier at point of submission. In this presentation we will provide an overview of our approach to policy, technological and editorial intervention, and training. We will discuss the successes - and failures! - of our attempts to increase transparency and the open sharing of data across a diverse range of journals in various subject categories.

Session B - Building a Distributed, Community-Based Approach for a More Resilient and Open Scholarly Communication System

Presenters: Kathleen Shearer (USRN), Martin Klein (COAR Notify), Petr Knoth (CORE)
Theme: Infrastructure

This session will discuss the need for and benefits of a distributed infrastructure landscape for scholarly communications involving repositories, preprint archives, diamond journals, and other various infrastructure elements. Distribution is a key requirement for a resilient, bibliodiverse and community-owned system and distributed governance of scholarly resources (pre-prints, post-prints, research data, supporting software, etc.) and infrastructures is important to ensure a small number of actors does not gain too much control or establish a quasi-monopolistic position. Despite the clear benefits, a distributed environment also presents challenges for discovery of content. To ensure funders can track where their research outputs, interoperability and value added services are needed. The session will convene representatives from several initiatives who are working on strengthening certain aspects of a distributed open science ecosystem to discuss several issues:

1. What are you doing in your project and how does it support a distributed ecosystem?
2. What is the current state of open science infrastructure in the US?
3. Where are the gaps / vulnerabilities in the system to ensure policy compliance?
4. What should be our priorities in terms of investments?

Session C - Advancing Open Science at the National Institutes of Health (NIH)

Presenters: Kristin Brethel-Haurwitz (Office of Behavioral and Social Sciences Research, NIH), Ishwar Chandramouliswaran (Office of Data Science Strategy, NIH), Lisa Federer (National Library of Medicine, NIH), Hilary Leeds (Office of Science Policy, NIH), Julia Slutsman (Office of Extramural Research, NIH), Luke Stoeckel (National Institute on Aging, NIH)
Theme: Community, Infrastructure, Policy

NIH continues to advance adoption of open science through community engagement efforts and has worked to promote best practices for data sharing and reuse, while supporting a diverse data sharing ecosystem. NIH's Data Management and Sharing Policy, effective January 2023, requires the submission of a Data Management and Sharing Plan and adherence to that Plan for funded research that results in the generation of scientific data. The Generalist Repository Ecosystem Initiative brings together seven generalist repositories to collaboratively focus on establishing cohesive and consistent capabilities, services, metrics, and social infrastructure, while supporting training and engagement activities to lower barriers to adopt best practices for data sharing and reuse. More broadly, NIH has also supported opportunities for its community to learn more about the challenges and potential of open science to encourage collaboration, consensus building, and new NIH-wide efforts. At Metascience 2023, NIH staff led discussions on the benefits of open science and how metascience can help evaluate the impact of these practices and policies. Continuing that conversation, this panel will also discuss how open science will change the methods, measures, and people engaged in science; disparities in adopting open science practices; open science infrastructure; and the costs of closed science.

Session D - A Year of Open Science Community Building at NOAA Fisheries

Presenters: Evan Howell (Director, Office of Science and Technology, NOAA Fisheries), Elizabeth Eli Holmes (Lead NMFS Open Science initiative and NMFS Openscapes program, NOAA Fisheries), Margaret Siple (Research Fishery Biologist, Groundfish Assessment, Alaska Fisheries Science Center, NOAA Fisheries), Amanda Bradford (Research Ecologist, NOAA Fisheries, Pacific Islands Fisheries Science Center, Cetacean Research Program), Brian Fadely (Research Wildlife Biologist, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA Fisheries), Vivian Matter (Branch Chief Data Analysis and Assessment Support, Sustainable Fisheries Division, Southeast Fisheries Science Center, NOAA Fisheries), Kathryn Doering (Interdisciplinary Fisheries Biologist, Office of Science and Technology, NOAA Fisheries), Carissa Gervasi (Social Scientist, Gulf of Mexico Integrated Ecosystem Assessment, Southeast Fisheries Science Center, NOAA Fisheries), Christine Stawitz (Quantitative Ecologist, Assessment and Monitoring Division, Office of Science and Technology, NOAA Fisheries), Lynne deWitt (IT Specialist, Environmental Research Division, Southwest Fisheries Science Center)
Theme: Community

During YOS23, NOAA Fisheries launched its Open Science initiative. This initiative supports our scientists, developers, resource managers, and policy analysts in the adoption of modern, Open Science workflows that enhance our scientific research and products. This cultural and skillset change is imperative to allow us to fulfill NOAA and federal Open Science, Open Data and Open Government mandates. Our Open Science initiative is an ambitious strategic plan that requires actively supporting staff as they transform to new Open Science workflows, increasing collaboration across our line office and expanding leadership and infrastructure support for Open Science. High-level strategic plans are important for organizational change, but change itself happens as people embrace the change. Community and connection plays a vital role in change at the individual, team, office and organizational level. In this session, we will share stories of the power—and the challenges—of Open Science community building. You'll hear stories from scientists and data managers on how a focus on open collaboration, psychological safety, and inclusivity has impacted their marine mammal assessments in Alaska and Hawaii, ecosystem management in the Gulf of Mexico and California, governance of Open Science infrastructure, and next generation fisheries stock assessment models.

Session E - Community-Based Coordination of Research Instrumentation Persistent Identifiers to Enable Open Science

Presenters: Andrew Johnson (Center for Research Data and Digital Scholarship, University of Colorado), Renaine Julian (Florida State University), Matthew Mayernik (National Center for Atmospheric Research), Claudius Mundoma (Stanford University), Matthew Murray (Center for Research Data and Digital Scholarship, University of Colorado), Greg Stossmeister (National Center for Atmospheric Research)
First Author: Aditya Ranganath
Theme: Infrastructure

As part of the NSF FAIROS RCN program, the FAIR Facilities and Instruments project seeks to develop community-based recommendations and best practices for research instrumentation persistent identifier (PID) adoption to enable open science. As the open science ecosystem coalesces around DOIs for datasets, ORCIDs for individuals, and RORs for organizations, multiple PIDs for research instrumentation (e.g., DOIs, RRIDs, ARKs) have emerged around particular use cases and disciplinary needs. Thus, a coordinated and community-based approach is needed to ensure PIDs for research instrumentation are adopted in ways that benefit open science broadly. This talk will present efforts to date, including multiple focus groups and a workshop that convened national experts to discuss motivations and barriers for PID adoption as well as near-term actions to target. These project findings represent an important step on the path to incorporating PIDs for facilities and instruments into the wider open science ecosystem, which allows these resources to be connected to other entities like data sets, researchers, organizations, articles, grants, and more. This is necessary for research transparency

and reproducibility as well as for recognizing the essential contributions of facility and instrument operators. The presentation will conclude by highlighting next steps for the project.

Session F - Publication Validation in the Natural Sciences: Innovative Solutions based on the Successes in Other Sciences

Presenters: Rebecca Ringuette (Heliophysics Digital Resource Library, NASA GSFC), Brian A. Thomas (Heliophysics Digital Resource Library, NASA GSFC)
Theme: Infrastructure

Publication validation, or verifying the truthfulness of a publication's work and conclusions, is nearly impossible in many natural sciences including Heliophysics. Recent changes requiring supporting datasets to have DOIs have slightly improved this barrier, but have raised other problems in their implementation. Innovative steps are now needed to address persistent problems in the article submission process, validation of the publication, and poor interlinking of metadata. This session will focus on ideas of how repositories, journals, reviewers and authors can better collaborate on these problems using new peer-review processes based on methods used in other fields and incorporating today's technology. We will begin with a few scene-setting presentations followed by open discussion supported by interactive technologies to discuss paths forward.

Session G - Making the Invisible Visible: Connecting Funder Repositories to the Global Research Infrastructure

Presenters: Ted Habermann (Metadata Game Changers), Jamaica Jones (University of Pittsburgh)
Theme: Infrastructure

The Global Research Infrastructure (GRI) is comprised of repositories and organizations that provide persistent identifiers with metadata about research objects and the connections between these objects, researchers, funders, research institutions, and one another. This infrastructure contains millions of objects and is growing rapidly, expanding the potential of open science to connect researchers and communities, accelerate research and address societal problems. The GRI's potential has been limited by siloed data and incomplete repository metadata. INFORMATE – an NSF-funded collaboration between Metadata Game Changers and CHORUS – seeks to connect repository and award metadata to answer questions such as: how can the GRI increase understanding of the contributions made to global knowledge by federal funding agencies? How can we use this infrastructure to increase understanding of connections across the global research landscape? How can this infrastructure be leveraged to increase connectivity across agency repositories and discovery tools? In this session we will present preliminary INFORMATE results, demonstrating how strengthening connections across the GRI can illuminate repository behaviors and temporal relationships between linked datasets and publications, demonstrate compliance with federal policy guidance, and build meaningful use cases of open science in action.

Session H - Open Science Unfolded: Translating Global Prescriptions on Policy Development, Monitoring, and Impact Assessment to Local Realities

Presenters: Ana Persic (UNESCO), Natalia Manola (OpenAIRE), Ioanna Grypari (Athena Research Center, OpenAIRE) – PathOS, Susan Reilly (Irish Research eLibrary)
Moderator: Tony Ross-Hellauer (KNOW Center)
Contributors: Athina Papadopoulou (NYIT), Leonidas Pispiringas (OpenAIRE), Harry Dimitropoulos (Athena Research Center), Jessica Catalano (CSIL)
Theme: Policy

In the evolving world of digital scientific research, Open Science policies are essential for promoting

collaborative and open knowledge exchange. This panel brings together representatives from UNESCO, OpenAIRE, the PathOS project, and IReL, providing diverse perspectives on Open Science policy development, adoption, and evaluation. UNESCO will delve into the formulation of Open Science policy recommendations, addressing the challenges of creating globally adaptable yet regionally relevant guidelines. OpenAIRE's contribution will focus on their role in monitoring the adoption and implementation of these policies in Europe, emphasizing the significance of aligning research communities with Open Science standards. The PathOS project explores the complexities of evaluating Open Science policies, particularly the challenges in establishing causality and assessing impact on the research landscape. IReL will discuss their approach to applying and monitoring Open Science policies within the context of the National Open Access Monitor Ireland, highlighting their efforts and providing insights into the practical aspects of policy implementation and evaluation. This panel is designed to offer an in-depth exploration of the Open Science policy lifecycle, underlining the challenges and collaborative efforts necessary at each stage. It aims to provide valuable perspectives for researchers, policymakers, and stakeholders engaged in the advancement of Open Science.

Session I - Evidencing the Prevalence and Impact of Open Science Practices

Presenters: Iain Hrynaszkiewicz (PLOS)
Theme: Rewards

There is a growing need for reliable data on the adoption of Open Science practices and the effects of Open Science practices: to better understand researchers', and to understand the effectiveness of interventions that are intended to change research culture and practice. Evaluating and monitoring Open Science is a critical aspect of the UNESCO recommendation on Open Science; major EU-initiatives such as PathOS, and the emergence of the Community for the Open Source Monitoring of Open Science (COSMOS), led by the French Open Science Monitor initiative. Scholarly publishers such as PLOS, with their 'Open Science Indicators', (OSI) initiative, and AGU, are tracking the adoption of Open Science practices – such as sharing data, code, protocols and preprints. Further, meta-researchers and tool developers are offering new insights on the impact and prevalence of Open Science. This talk will demonstrate the Open Science community's growing ability to understand if Open Science is achieving its goals. It will foreground the importance of establishing common principles for use and development of new metrics / indicators. Such as pragmatism; transparency; reproducibility; efficiency; interoperability; aligning with community standards; responsible use; and acknowledging the limitations of quantitative metrics.

Session J - The Turing Way: Aligning Professional Roles and Incentives with Open, Reproducible, and Ethical Research

Presenters: Emma Karoune (The Alan Turing Institute)
Theme: Community

In an era marked by rapid technological progress and the evolving landscape of data science and AI, the imperative for transparent, reproducible, and ethically sound research practices is more pressing than ever. The Turing Way, hosted at The Alan Turing Institute, is an open science, open collaboration, and community-driven initiative that works towards addressing these imperatives. It fosters collaboration among a diverse international community of contributors from various backgrounds and expertise. They are collaboratively developing and promoting best practices in data science, and sharing via an online handbook covering reproducibility, project design, collaboration, communication, ethics, and community building. Over the past five years, The Turing Way has significantly shaped the field of data science by professionalising diverse roles and aligning them with open, reproducible, and ethical research practices. This session's panel discussion will feature experts from The Turing Way community, exploring diverse

initiatives aimed at enhancing and transforming contemporary research practices related to incentives and rewards. The panel will provide insights into core principles, and challenges and opportunities in the professional landscape that fosters open collaboration, promotes reproducibility, and uphold ethical standards. Participants will leave understanding the intricate relationship between professional responsibilities and recognition that combine open, reproducible, and ethical research.

Session K - A New Science Publishing Model for a More Open Future

Presenters: Paul Shannon (eLife)
Theme: Infrastructure

eLife envisions a future where a truly global community of scientists produces open and trusted results for everyone's benefit. As a significant step, we launched our new publishing model last year that eliminates accept/reject decisions following peer review and focuses on the public review and assessment of preprints. Aligning with the Year of Open Science 2023 key goals, our model aims to provide a more transparent, faster and fairer way to publish research, including work funded by US federal agencies and beyond. The public reviews and assessments are designed to help readers, funding committees and others easily assess the trustworthiness of new findings. Fundamental for delivering this model are the open-source technology platforms we're developing to display, review, disseminate and curate content, which others can use in their own processes. In this presentation, we'll summarise our goals with the new model and next steps, including our ongoing collaboration with preprint servers such as bioRxiv, open-source community partners such as Coko and DocMaps, and other organisations involved in open preprint review and curation. We'll show how we're working together to put in place end-to-end workflows at eLife and create the wider infrastructure needed to improve research communication for all.

Session L - Progress in Including Research Software in the Scholarly Communication Ecosystem

Presenters: Daniel S. Katz (University of Illinois Urbana-Champaign), Morane Gruenpeter (Software Heritage), Kristina Vrouwenvelder (AGU), Daniel Garijo (Universidad Politécnica de Madrid)
Theme: Infrastructure

This panel will discuss progress in including research software in the scholarly communication ecosystem, including a five-minute introduction and three ten-minute presentations, followed by ten minutes for questions. The presentations will be on research software and metadata, research software and publishing, and research software and registries and repositories. Together the work in these three areas allow research software to be made more FAIR.

Session M - Open Science Data for Space Biology and Health Research

Presenters: Lauren Sanders (NASA ARC), Ryan Scott (NASA ARC/KBR), Amanda Saravia-Butler (NASA ARC/KBR), Danielle Lopez (NASA ARC/KBR), Samrawit Gebre (NASA ARC), Sylvain Costes (NASA ARC)
Theme: Community

The NASA Open Science Data Repository (OSDR) embodies and advances NASA's open science vision, revolutionizing open access to space biology data. OSDR started as GeneLab in 2018, and grew substantially with the integration of data from the Ames Life Sciences Data Archive in 2023. Rare and precious space biology datasets that were previously archived are now available for download and analysis by the scientific community. To enhance accessibility, GeneLab collaborated with a diverse

iscientific community, forming the Analysis Working Group (AWG) of data users in 2018. Over five years, the AWG grew from 20 to 600 members, contributing to over 10 scientific publications. Monthly virtual meetings, workshops, and symposiums fostered a collaborative environment, promoting inclusivity among researchers, students, and industry professionals. This community spawned initiatives like the European Space Agency Topical Team, International Standards for Space Omics Processing (ISSOP), and the COVID-19 International Research Team (COV-IRT). The 2023 Year of Open Science also saw OSDR integrating a massive amount of data from the SpaceX Inspiration-4 mission, one of the first civilian astronaut missions. Making this human data available to the community has and will continue to accelerate our knowledge about spaceflight effects on living systems.

Session N - Understanding Your Place in the Research Data Ecosystem: NIST Research Data Framework and Open Science Integration

Presenters: Andrea Medina-Smith (NIST), Eva Campo (Campostella R&C), Bob Hanisch (NIST)
Theme: Infrastructure

The NIST Research Data Framework (RDaF) and open science are aligned in prioritizing transparency in research. The RDaF emphasizes open access to data, ensuring its availability for verification and collaboration. Both aim to enhance reproducibility by providing detailed documentation and methodologies alongside datasets. The NIST RDaF encourages interoperability, aligning with open science's goal of creating a seamless, interconnected research landscape. Overall, the alignment underscores a shared commitment to fostering a collaborative and accessible scientific community. The RDaF as a tool offers a comprehensive overview of the research data ecosystem - including open data and science - presenting a structured approach to RDM. Developed collaboratively, this framework outlines key topics and subtopics across the research data lifecycle, covering programmatic and operational aspects as well as fundamental RDM principles. This session will demonstrate how the RDaF can be a transformative tool for organizations and research professionals, enabling them to assess and enhance their RDM practices in line with industry best practices. Discover the transformative potential of the RDaF in revolutionizing RDM within all scientific disciplines.

Lightning Talks A

Theme: Data Sharing

Title: Designs for a Platform to Enable and Motivate Open Geospatial Science
Presenters: Rachel Opitz (Open Geospatial Consortium), Ingo Simonis (Open Geospatial Consortium)
The Open Geospatial Consortium (OGC)'s mission is to make location information more FAIR by supporting its member community, comprised of 500+ organizations from government, academia and industry, to develop and deploy open geospatial data and systems standards and technologies that leverage them. While open data, open source code, and collaboration are part of OGC members' work, some open science practices remain challenging to implement, especially in applications using large earth observation data. From 2024-2026 the OGC will design and build a platform to enable and promote Open Science practices in workflows that use geospatial data: the Open Science Persistent Demonstrator (OSPD). This talk summarizes specific challenges faced by the geospatial community which motivated the OSPD, from dependencies on large, frequently updated datasets hosted by diverse agencies, to the sometimes hidden impacts of platform specific implementations of geospatial data storage and processing systems. It highlights past OGC work, including developing API standards for Processes and Analysis Ready Data, that brought these to the fore. It previews approaches planned for implementation in the OSPD and use cases. It aims to elicit advice from the wider Open Science community and invite them to engage in developing the OSPD.

Title: A FAIRer metaBUS: FAIRifying the Largest Curated Database of Social Science Findings
Presenters: Isaiah Lynch (Virginia Commonwealth University), Frank Bosco (Virginia Commonwealth University)
The volume of scientific information has grown massively over time; however, it remains relatively disorganized. In contrast to information about retail products listed on internet retailers, scientific information is rather unFAIR (i.e., not readily findable, accessible, interoperable, and reusable). We describe relatively recent infrastructure components that allow teams of scientists to make their information FAIRer. FAIRifying involves linking several components: (1) one or more controlled vocabularies (i.e., ontologies), (2) a metadata schema that specifies acceptable values and formats, and (3) metadata instances (i.e., data). We provide a high-level walk-through of how we have updated the metaBUS platform to incorporate these components. Specifically, we describe the process of modifying and posting our ontology at bioportal, the process of metadata schema creation using CEDAR (i.e., metadatacenter.org) and linking schema with ontology and, finally, linking 1.1 million rows of raw data (i.e., metdata instances) to the infrastructure. Furthermore, to showcase how FAIRifying data increases efficiency and accuracy of research dissemination, we will use the new infrastructure to conduct instant meta-analyses through metaBUS. We envision our presentation will advance open science by showing the advantages of FAIR data and by providing actionable steps for FAIRifying data.

Title: The Challenge of Evaluating the "FAIRness" of Records-Based Repos
Presenters: Christine Kirkpatrick (San Diego Supercomputer Center, GO FAIR US)
The NIAID Data Landscaping and FAIRification project is an effort to assist biomedical researchers and associated communities with an analysis of NIAID and NIH data repository metadata. Part of this effort is an evaluation of the metadata quality using existing tools (e.g., F-UJI). During these evaluations, the team has identified a specific challenge of evaluating records-based repositories, as the tools designed for FAIR evaluation focus on files. This lightning talk will outline these challenges as well as the team's analysis of how to credibly evaluate records-based data repositories.

Title: The NASA Science Explorer: ADS for all of NASA Science
Presenters: Alberto Accomazzi (SciX), The NASA Science Explorer (SciX) Team
As part of NASA's Open Source Science Initiative, the NASA Astrophysics Data System (ADS) is extending its database to cover all research funded by the NASA Science Mission Directorate (SMD) divisions. The ADS was selected to lead this effort based on its decade-long, groundbreaking efforts in supporting the goals of Open Science for the Astronomy and Astrophysics community. The expansion plan, which has now begun in earnest, involves the creation of a literature-based, open digital information system covering and unifying the fields of Astrophysics, Planetary Science, Heliophysics, and Earth Science. It will also cover NASA funded research in Biological and Physical Sciences. Codenamed NASA Science Explorer, or SciX for short, it will extend ADS to become a permanent major component in the infrastructure of scientific research, providing important contributions towards the goal of open science. In this presentation, Dr. Accomazzi will discuss the features of the new system, highlighting how they extend the functionality currently available in ADS to better support interdisciplinary research.

Title: Beyond the FAIR principles: Expanding the Conversation from "Can I reuse these data?" to "Should I reuse these data?"
Presenters: Tracey Weissgerber (QUEST Center for Responsible Research, Berlin Institute of Health at Charité - Universitätsmedizin Berlin)
The FAIR principles indirectly outline data depositors' responsibilities by identifying dataset properties that facilitate reuse. However, the data provenance and the quality of the methods used to generate data are often overlooked. We cannot reuse data responsibly without knowing how they were generated. FAIR data evaluations typically focus on the question "Can I reuse these data?". We argue that we should add an additional focus, by asking "Should I reuse these data?"; and "How should I reuse these data responsibly?". These questions allocate responsibilities between the data depositor and the prospective

data (re)user. We propose three factors to navigate this shift. First, we need guiding principles outlining data (re)users' responsibilities. Experts who want to contribute should contact us. Second, we should recognize that without detailed methods, shared data have limited value. Third, we should acknowledge that methods are not just metadata contextualizing datasets; they are one of the most reusable research outputs. We must prioritize sharing of open and reusable methods as separate, essential research products. The PRO-MaP recommendations facilitate this by outlining actions that researchers, research institutions and departments, publishers and editors, and funders can take to improve reporting of methods and reusable step-by-step protocols in the life sciences.

Lightning Talks B

Theme: Metascience

Title: Reviewing the Evidence of Open Science Impact: Findings, Challenges, Prospects

Presenters: Tony Ross-Hellauer (PathOS project, Know-Center GmbH, Graz University of Technology)
Contributors: Thomas Klebel (Know-Center), Nicki Lisa Cole (Know-Center), Lena Tsipouri (OPIX), Eva Kormann (Know-Center), Istvan Karasz (Technopolis), Sofia Liarti (OPIX), Lennart Stoy (Technologis), Vincent Traag (CWTS Leiden), Silvia Vignetti (CSIL)

What evidence exists for the academic, societal, and economic impacts of Open Science? To answer these questions, the EC-funded PathOS project (https://pathos-project.eu/) has conducted three major new scoping reviews guided by the PRISMA Extension for Scoping Reviews (PRISMA-ScR) methodological framework. Through systematic screening and assessment of over 30,000 records, we identified more than 600 relevant studies. Initial results from our search of academic databases are available within the report "PathOS D1.2 Scoping Review of Open Science Impact" (https://doi.org/10.5281/zenodo.7883699), with the full synthesis (including results obtained via citation and grey literature searching) in its final stages (and preprints forthcoming). We here give our first full presentation of this work, which speaks directly to multiple themes of the Year of Open Science, in particular goal three ("Account for open science activities in evaluations"). We find that evidence of impact is concentrated around Open Access (primarily academic impact) and Citizen Science (primarily societal impact), with surprisingly few studies of impact for many other Open Science aspects, and hardly any evidence of economic impact. Presenting these findings, we also critically reflect on challenges in inferring causality in Open Science impact, issues of data availability that shape the areas of investigation, and how our findings point the road ahead not only for investigations of Open Science impact, but also for the Open Science agenda itself.

Title: Anonymizing Applications for Access to Scientific Equipment: Pre-post Evaluation by Gender and Career Seniority

Presenters: Lisa A. Williams (UNSW Sydney)

Evidence supports the efficacy of anonymizing applications for access to scientific equipment in reducing biases in the peer review process for women, early-career researchers, and other marginalized groups—specifically, in the astronomy and planetary science sector. We conducted a trial to study the effects of anonymizing applications for the use of specialized scientific equipment to four Australian organizations. Our aims were to document any preexisting disparities in grant scores, success rates, and allocated resources, and to evaluate how anonymization would impact these outcomes. We analyzed a dataset of 4,582 applications (3,348 pre-anonymization; 1231 post-anonymization) according to the gender and career seniority of the lead investigator. The introduction of anonymization led to improved success rates for early-career researchers at one of the two organizations with career seniority data. Anonymization generally maintained the preexisting gender equity landscape before anonymization across all four organizations. Our findings support anonymization as a mechanism to improve peer review by reducing inequities in research resourcing, particularly for early career researchers. Anonymization stands to create a positive ripple effect in the career pipeline, diversifying the research pool, and supporting the retention and career progression of researchers facing barriers in STEM research.

Title: How Government Funders Can Improve the Transparency of University Research Integrity Investigations

Presenters: Kathryn Zeiler (Boston University School of Law), Jason Chin (Australian National University College of Law)

Public trust in science is essential and seems to be declining. Recent high profile news reports have documented allegations and discoveries of fraud. Investigations by institutions that house suspected fraudsters are often conducted in secret, and, in many cases, the details of the findings are not shared with the public. Some universities disclose neither the details of investigations nor the process used. Some universities refuse to confirm whether an investigation was conducted. Currently, universities that benefit from vast amounts of government funding for research are not required to conduct investigations using particular procedures nor are they required to disclose any information to the public about investigations. The U.S. Office of Research Integrity expects institutions to have policies and procedures to address research misconduct. No government funder, however, has instituted specific requirements for how universities investigate misconduct and what they must disclose about their findings. We propose that all government funders of research adopt and enforce institutional investigation requirements. Our proposal includes detailed requirements regarding processes, timing, and eventual disclosure. We will discuss how the proposed requirements might properly balance researcher and institutional reputational concerns with the public's right to information about fraud investigations.

Title: Open Science for Academic-Supported Community-Led Research

Presenters: Nathan Morrow (Tulane University)

Although open science promises greater inclusion and diverse participation, a search of the code-hosting platform GitHub reveals a striking lack of participation in open source projects in the southern United States. The Gulf Coast states (Louisiana, Alabama, Mississippi, Florida and Texas) also struggle against pervasive socioeconomic disparities including inequity in environmental justice, health, and other vulnerabilities. Access and use of data is one of the greatest challenges to advancing EJ action. NASA can provide an improved evidence base to advance underserved EJ communities as they struggle with air quality, localized flooding, climate change-related extreme events, and disaster resilience. This represents a significant opportunity to engage underserved communities and environmental justice organizations with diverse and supportive academic partnerships to advance open science for climate, environmental, and ocean justice with NASA data and NASA Transform to Open Science (TOPS) resources. Advancing Gulf Coast Environmental Justice Leadership & Engagement in Open Science (AGEJLE-OS) will (re)convene community-engaged academic-supported EJ networks to 1) to obtain certification badges in open science; 2) facilitate collaboration on open science projects that use NASA Earth Science data to address pressing climate and environmental justice priorities in the Gulf Coast States and 3) strengthen proposal development capacity for community-led academic-supported research.

Title: Unveiling the True Costs of Academic Data Sharing

Presenters: Alicia Hofelich Mohr (University of Minnesota), Shawna Taylor (Association of Research Libraries)

Making funded research data accessible to the public is integral to advancing science and data reuse. The Realities of Academic Data Sharing (RADS) project, a collaborative initiative between the Association of Research Libraries and the Data Curation Network, used a mixed-method study to assess the actions and associated costs of complying with federal data management and sharing (DMS) policies. We found that researchers, despite available institutional support, often manage DMS activities themselves or within their teams. The number of activities completed on their own, rather than with institutional or external support, was associated with higher DMS costs per award. Similarly, our data shows that sharing data locally in institutional repositories was associated with lower DMS costs for researchers; however,

providing this local infrastructure did incur significant expenses for institutions. Our findings underscore the importance of fostering connections within and across academic institutions. Data management and sharing is not cost-free, and our data shows the need for more effective and efficient strategies to invest in making data open, available, and accessible long-term. This research contributes to the ongoing discourse on open science, providing insights into the real costs of data sharing and the potential for institutional collaboration to optimize resource allocation.

Lightning Talks C

Theme: Physical Sciences

Title: How Can Open Science Reduce Research Waste Across fields

Presenters: Antica Culina (Institute Ruder Boskovic, Croatia), Marija Purgar (IRB, Croatia), Matthew J. Grainger (Norwegian Institute for Nature Research - NINA), Shinichi Nakagawa (The University of New South Wales), Alfredo Sánchez-Tójar (Bielefeld University), Dom Roche (Social Sciences and Humanities Research Council)

This workshop will address the issue of research waste and explore how open science approaches can help reduce it. Research waste refers to conducted studies that have limited or no informative value. Waste has so far been estimated in medicine and ecology, where 85% and 82%-89% research is wasted, respectively. Research waste is a complex problem caused by suboptimal research, funding, and publishing practices, and the current incentive, assessment, and support systems in science. Open science offers solutions to reduce research waste. By participating in this workshop, attendees will have the opportunity to learn about the concept of research waste, and its components, and a range of open science practices and principles (e.g. pre-registration, open data, open codes). They will then discuss pathways, enabled by open science, that can reduce research waste in their fields. The workshop invites all stakeholders who impact the way research is done or are impacted by conducted research, including researchers, publishers, funders, and others. The outcomes of the workshop will inform further work on reducing research waste. Join us to learn how to embrace open science principles and practices to increase the value of research.

Title: Building Community Around the Year of Open Science at the US Geological Survey

Presenters: Viv Hutchison (USGS)

The US Geological Survey engaged the scientific research community by building community around the Year of Open Science. In this lightning talk, USGS will highlight ways in which we involved the community in events such as the biennial meeting of the Community for Data Integration (CDI) themed “Open Data for Open Science”, that brought together over 400 participants to build capacity and share experiences in advancing open data in USGS. Additionally, USGS will describe our efforts to host intentional, focused trainings, such as a Data Equity Primer workshop, that further informed and brought awareness to the community about critically important topics. The USGS also celebrated the Year of Open Science by collecting stories of open science successes, developing open science tips, and updating the Public Access Plan. How did we accomplish what we did in 2023, and what next steps will USGS take to advance open science?

Title: HelioCloud: An Open Science Cloud-Computing Platform

Presenters: Brian Thomas (NASA), Jon Vandegriff (Johns Hopkins Applied Physics Lab), Sandy Antunes (Johns Hopkins Applied Physics Lab), Chris Jeschke (Johns Hopkins Applied Physics Lab)

Heliocloud is a cloud-computing solution built by NASA and Johns Hopkins Applied Physics Laboratory (JHUAPL) to support collaborative research in the heliophysics domain, with particular attention to: (a) making cloud computing resources more approachable & easier to use and (b) facilitating the sharing of cloud-hosted datasets and research notebooks across our user-base. Heliocloud has been recently released as open source (https://github.com/heliocloud-data) for any/all interested research organizations. The lighting talk will cover (1) Purpose of Heliocloud project (see above), (2) Key

contacts/connections for project, (3) Overview of technical architecture (high-level diagrams, 'approachable' technical topics), (4) Capability demonstration: Development of a shared analysis notebook using publicly available datasets. The primary objective would be to raise general awareness of the project and its capabilities to the research community. Secondary objective is to provide a demonstrable example of using cloud computing technologies in support of open science.

Title: NASA Openscapes Approaches and Stories of Kinder, Open Science in the Cloud
Presenters: Julia Lowndes (Openscapes), NASA Openscapes Mentors
2023 was the Year of Open Science. It was also the Year of Taylor Swift, according to the The New York Times. What can the Open Science movement learn from Taylor Swift, whose specificity in her storytelling has connected and empowered millions of people? Here we'll share Open Science momentum and challenges we've seen in environmental and Earth science, with specific stories from NASA Openscapes. The NASA Openscapes project (https://nasa-openscapes.github.io) answers a call from NASA Earthdata to support both staff who work across NASA data centers and early adopter scientific researcher teams as they transition their workflows to the cloud. Why we do this work: we are motivated by climate and social change. How we work: the Openscapes Flywheel, which is an open source tool for movement building (Robinson & Lowndes 2022). We reach for it as a tool for planning, implementation and communication, just as we reach for R, Quarto, and JupyterHubs for analysis, documentation, and cloud computing. Here we'll share about this ongoing work and how technical and social infrastructure underpins daily practices as we meet mentors and researchers where they are. We welcome you to join the movement.

Title: MOVEing Towards Open Science in Heliophysics: The Magnetopause Open Validation Experiment
Presenters: Rebecca Ringuette (HDRL, GSFC, NASA), Alex Antunes (APL/JHU), Jonathan T. Niehof (UNH), Chris Bard (GSFC, NASA), Barbara J. Thompson (GSFC, NASA), and Brian A. Thomas (HDRL, GSFC, NASA)
The Magnetopause Open Validation Experiment (MOVE, https://osf.io/v4drt) is an Open Science project in Heliophysics aiming to increase transparency for research requiring large datasets or computationally intensive analyses. MOVE will support its community members in their research by combining open science practices and methodologies with the new technologies of cloud-based science platforms and open-source software. We present one stack of technologies - the Open Science Framework project pages, HelioCloud, GitHub, the Python in Heliophysics Community software packages, and HelioNauts - as one possible solution for the capabilities and flexibility desired by the magnetospheric research community in Heliophysics. We will update the Open Science community on the development of the infrastructure design, community management plans, and the spectrum of openness possible with the technologies included. This presentation will be designed to collect feedback via a Miro board on the specifics of the effort as we move towards our beta-testing phase later this year.

Lightning Talks D

Theme: Rewards & Infrastructure

Title: Road2Openness - A Web-Based Open Science Self-Assessment Tool for Research Performing Organizations
Presenters: Verena Heise (Freelance Open Science Researcher, Germany), Patrick Figge (University of Passau, Germany), Nils Hachmeister (PD Consultancy, Germany), Ulrich Herb (scidecode science consulting; Saarland University and State Library, Germany), Damian Paderta (Freelance Digital Consultant, Germany), Petra Siegele (Head of the Austrian Center for Citizen Science at the OeAD, Austria's Agency for Education and Internationalisation)
Open Science means opening up science through transparency in the research process and participation of new actors in research and innovation. Many research performing organizations (RPOs) are interested

in or have set out to strengthen Open Science throughout their institution. To facilitate top-down engagement from institutional leaders and culture change we have developed Road2Openness (R2O, https://road2openness.de/). R2O is a web-based tool that helps institutional leaders evaluate their current Open Science activities and supports them with recommendations for a strategic opening to develop training, infrastructure, and incentive systems. In a two-step process, there is first a web-based questionnaire to assess current institutional practices in a number of areas: Open Access Research Outputs, Citizen Science, Open Innovation, Open Educational Resources, Research Quality Management, Open Governance, and Open Research Assessment. As a second step, we provide information from the literature and good practice examples from other institutions to support further strategic developments. We partnered with three universities in Germany to co-develop and pilot the tool. We will present the idea behind R2O, how it can be used by RPOs, and the results from the pilot project. R2O is currently only available in German but an English translation is under way.

Title: The OpenAIRE Graph: A Comprehensive Knowledge Graph for Open Science Scholarly Communication

Presenters: Paolo Manghi (OpenAIRE/CNR-ISTI, Italy), Miriam Baglioni (CNR-ISTI, Italy), Claudio Atzori(CNR-ISTI, Italy), Andrea Mannocci (CNR-ISTI, Italy), Giulia Malaguarnera (OpenAIRE), Thanasis Vergoulis (OpenAIRE/Athena Research Center)

Open Science scholarly communication refers to the transparent exchange of research-related information among researchers, scholars, and other interested individuals. It encompasses sharing and discovering scientific knowledge, monitoring, and research assessing. A collection of academic metadata can be envisioned as an extensive "knowledge graph" reliant on persistent identifiers, including diverse research entities beyond scientific publications. The OpenAIRE Graph stands out as one of the largest resources in this sense, interconnecting various research entities such as articles, research datasets, software, organisations, funders, projects, authors, research communities, and data sources. It aggregates metadata and links from over 2,8K active data providers, including institutional repositories, publishers, and registries. It uses text mining to discover connections from an ever-expanding collection of articles and over 24 million PDFs, and applies inference techniques to enrich its content further. The OpenAIRE Graph is powered by a community-driven infrastructure and provides the research community and enterprises with an updated, global science record, fostering openness and transparency. Currently, researchers, institutions, publishers, the European Open Science Cloud, and policymakers use the OpenAIRE Graph for analysis, research, evidence-based policymaking, and research assessment.

Title: Harmonizing Commercial Indices and Public Data: Enhancing Decision-Making in Research Impact Assessment

Presenters: Aadi Narayana Varma Dantuluri, (SaaStra)

In today’s academic landscape, the assessment of research impact is predominantly guided by commercial indices, which, while comprehensive, often lack universal accessibility due to paywalls and proprietary constraints. This exclusivity creates a significant gap in how research impact is tracked and reported, as these commercial tools do not always align with publicly available information. My presentation, titled 'Harmonizing Commercial Indices and Public Data: Enhancing Decision-Making in Research Impact Assessment', addresses this critical issue. Organizations that fund and oversee research rely heavily on these commercial indices to evaluate the impact and relevance of research activities. However, the limited accessibility of these indices can result in decision-making based on incomplete or skewed data. This not only risks overlooking significant research contributions but also affects the visibility of researchers, particularly those whose work is not adequately represented in these commercial platforms. Their ability to attract necessary funding and collaboration opportunities is consequently diminished. The presentation proposes a solution to bridge this gap by integrating data from both commercial indices and publicly available sources. Such an integration would offer a more balanced and comprehensive view of research impact, facilitating more informed and equitable decision-

making. It would democratize research impact assessment, recognizing a broader range of contributions and fostering a more inclusive research environment.

Title: DOAJ: An Open, Global and Trusted Infrastructure for Open-Access Journals
Presenters: Ivonne Lujano (Directory of Open Access Journals)
DOAJ is a global directory that indexes more than 20,000 open-access journals, regardless of discipline, geography or language. It is an independent, non-profit organization that for 20 years has contributed to ensuring that the contents of journals are freely available online for everyone. DOAJ's mission is to increase the visibility, accessibility, reputation, usage and impact of quality, peer-reviewed, open-access scholarly research journals globally. Currently, the organization is made up of team members, ambassadors, and volunteers based in 45 countries around the world, who speak 36 languages. DOAJ has established a set of criteria that have become a gold standard for open-access publishing worldwide. For instance, several research funders who require researchers to publish their work in open-access venues take the DOAJ as a list of trusted, good-quality journals (e.g., the European Science Foundation). In this lightning talk, I will discuss the evaluation process we follow to ensure the trustworthiness and quality of journals in our index, as well as DOAJ's plans to keep being an infrastructure that supports equitable openness to scholarly publications globally.

Title: Leveraging UNESCO Recommendations to Drive Open Science in Nigeria
Presenters: Idowu Adegbilero-Iwari (Afe Babalola University, Ado-Ekiti, ABUAD)
Considering the imperatives of open science for modern scholarly work and scholars especially in the way enquiries are made and findings reported and/or accessed, and the widening support for the movement to make Open default, promoting the Open ideals is a call to contribute to the common good. Notwithstanding the huge benefits Open science offers, awareness and adoption remain at the lowest ebb in certain societies and regions of the world such as Nigeria. Noting the significant support of such an important international organisation like UNESCO with its recommendation of Open Science, we presumed this would accelerate wide adoption in usually lagging societies, especially member states of the organisation. We thus proposed to organise Open science advocacy and community-building events around the UNESCO recommendation on open science the outcome of which this paper proposes to share in the instance of higher educational institutions in Ekiti State, Nigeria.

Lightning Talks E

Theme: Metascience

Title: Science Journalism's Usage and Understanding of Open Access Research
Presenters: Teresa Schultz (University of Nevada, Reno)
Dozens of studies have shown how open access publishing can increase the impact of research through citations in other scholarly literature. However, for open science to be fully utilized, all communities need to benefit, not just academia. This presentation will discuss the results of a survey of science journalists in the United States that sought to better understand what they think about open access research and how they use it in their own reporting. The vast majority of the public will learn about scholarship not by reading it directly but by reading news articles that cite and reference scholarly articles. Therefore, learning how the news media utilizes open science research can help us better understand the impact of open access on the broader public as well as help direct future strategic plans for open science to ensure scholarly researchers are not the only ones who benefit from it.

Title: Reimagining Sustainable Publication Funding Models for Worldwide Uptake of Open Access
Presenters: Uttkarsha Bhosale (Enago Academy), Anagha Nair (Enago Academy), Dr. Anupama Kapadia (Enago Academy)
Open access (OA) publishing aims to disseminate research freely but escalating article processing

charges (APCs) are concerning for authors worldwide. This study explores awareness, acceptance, and concerns surrounding OA and APCs amongst researchers across diverse world regions through surveys and interviews. Substantial geographical differences exist, with lower-middle income countries expressing more financial constraints in adopting OA avenues and wariness about quality standards. High-income countries display greater cognizance of concepts but reluctance regarding potential misuse of APCs for profit incentives alone. We classify region-specific issues and provide evidence-based suggestions for building awareness and mainstreaming OA. Further, various alternative funding structures like crowdsourcing models, cost-sharing consortia, price capping based on country income levels, and waivers are discussed to alleviate APC cost burdens. Implementing more equitable frameworks for open dissemination requires reconciling publish-or-read barriers for researchers globally with publisher sustainability through cooperative, contextual solutions from funders, institutions and policymakers.

Title: Results from a Springer Nature-Code Ocean Pilot to Support Code Sharing
Presenters: Erika Pastrana (Springer Nature)
Do journal submission platform integrations increase the sharing of publicly accessible code? Can these same integrations also help editors and reviewers check compliance and review the quality of shared code? This lightning talk will focus on the results of a pilot with the code sharing platform Code Ocean and two Nature journals. We will share insights about the impact of automated technological support, author service, and editorial interventions that support the sharing of code.

Title: In the Era of Open Science, Communication of Research Results to Participants Remains an Afterthought
Presenters: Kate MacDuffie, Stephanie Kraft, and Benjamin Wilfond (Treuman Katz Center for Pediatric Bioethics, Seattle Children's Research Institute, University of Washington School of Medicine)
The goal of Open Science efforts—to shift the culture of research towards a norm of proactive dissemination of data and results—is admirable, yet rarely addresses the direct communication of results to people who participate in research. People participate in research because they want to help, yet rarely receive feedback on how they have helped. There are no requirements or standard practices for communicating the overall results of research studies to people who participate, despite decades of scholarship arguing that sharing results is part of researchers' ethical responsibility to show respect to participants, and that participants overwhelming want to learn the results of studies they contribute to. "Open access" research publications and data may not be truly accessible to those who lack scientific training or technological tools but who nevertheless contribute their data or even take on personal risk to participate in research. Learning the results of the research you participate in—in language you can understand and a format you can access—is a demonstration of respect and a bare-minimum fulfilment of what is owed to research participants. Infrastructure and policies that support direct results communication are needed and should be prioritized in future Open Science efforts.

Title: Providing Context and Transparency to Scholarly Journal Evaluations
Presenters: Teresa Schultz (University of Nevada, Reno), Matt Ruen (Grand Valley State University)
The concern over "predatory publishers" continues unabated with a focus on open access journals and publishers, despite many criticisms around the term. A number of lists have attempted to provide binary judgments but fail to consider contextual issues and insist on creating "good" and "bad" labels when it can depend on authors' specific needs. At the same time, people in academia - often librarians - who do provide qualitative evaluations about these journals do not receive credit for their work. Reviews: The Journal of Journal Reviews seeks to ameliorate these issues by providing a platform to publish peer reviewed evaluations of all scholarly journals - not just open access venues - while at the same time giving those who regularly review journals a place to receive scholarly credit in their evaluations. The goal of RJJR is to help researchers reach their own conclusions based on a concise, evidence-based summary

of a journal. This presentation will discuss the problems with the many lists that claim to assess scholarly journals and how RJJR, including its openly licensed rubric, seek to alleviate some of these issues by improving transparency of journal reviews as well as encouraging scholarly journals to make their practices and policies more transparent.

Lightning Talks F

Theme: Replication

Title: Creating Momentum with Little Resources: How Small Initiatives Can Advance the Open Science Movement

Presenters: Dr. Cassie Short on behalf of the Open Science Interest Group of the Department of Psychology (University of Oldenburg)

The field of psychology has been particularly affected by the replication crisis, and it is evident that measures have to be taken to improve the credibility and reputation of the discipline. These measures should be of large-scale and international scope, but accessibility to and comprehension of these measures to the scientific community should be actively promoted. Local initiatives can contribute significantly to the integration of open science principles into curricula and scientific work. Based on this idea, the Open Science Interest Group (OSIG) identifies as a support structure for scientific staff and is dedicated to enforce transparent, credible, reproducible, and accessible research within the Psychology Department of the University of Oldenburg and possibly beyond. The group was established without funding by PhD-Students and Post-Docs with the primary goal of facilitating the exchange and preservation of knowledge regarding open science principles and practices among students and researchers. As our approaches are easily transferable to other scientific working groups, we want to share our experiences, discuss potential obstacles, and exchange ideas with other low-level initiatives. With our lightning talk, we want to provide a framework and hopefully encourage interested researchers to start a grassroots movement with the goal of advancing open science.

Title: Building a Replicability Community in Biochemistry With the Help of Undergraduate Students: An Example of Glycan-Binding Proteins and Their Membrane Ligands from Cell Lines.

Presenters: Jean-Philippe Gourdine (Lewis & Clark College)

Scientific information can be hidden in silos for many reasons such as 1) inaccessibility to journals (paywalls) 2) lack of awareness of open databases 3) lack of interoperability between these databases 4) lack of transparency 4) unpublished data. These barriers create knowledge gaps, decrease the replicability of science, and overall cost money to taxpayers who fund the research. Teaching lab settings in Predominantly Undergraduate Institutions (P.U.I) can offer a great opportunity to bridge these gaps by teaching i) data and statistical literacy ii) biochemical techniques iii) replicability of science. The objective of this project is to use the Center for Open Science as a hub to connect databases, unpublished data, and literature to set a replicability framework involving P.U.I students from different classes or institutions working on the same independent and blinded project. An example of the project will be given with a glycan-binding protein and one cell line. We propose to have students 1) create a repertoire of ligands based on published papers and proteomics databases (e.g.,https://www.ebi.ac.uk/pride/) 2) independently reproduce affinity chromatography followed by mass spectrometry experiments 3) Compare their data with their repertoire and 4) develop reproducibility metrics.

Title: Tracking and Mainstreaming Replications across the Social, Behavioral and Cognitive Sciences (TRACKREP)

Presenters: Lukas Wallrich (FORRT), Helena Hartmann (FORRT)

The TRACKREP project, initiated by the Framework for Open and Reproducible Research Teaching (FORRT), confronts the challenges of underused and undercited replication studies in scientific literature. This effort is crucial for the integrity and progress of scientific knowledge. TRACKREP's mission is to

enhance the visibility and integration of replication studies across diverse disciplines, promoting a more accurate representation of scientific research. At the core of TRACKREP is the development of a comprehensive, crowd-sourced database. This ambitious endeavor has already cataloged over 800 replication studies from more than 20 fields, merging data from various projects into a singular, accessible platform. Complementing this, TRACKREP is designing two innovative online applications. The 'Replicability Annotator' will aid educators in identifying replicated studies, enhancing their teaching resources. Simultaneously, the 'Replication Explorer' app will allow for the exploration and visualization of replication effects, facilitating in-depth meta-scientific analysis. Beyond these technological advances, TRACKREP emphasizes outreach and dissemination. Through workshops, teaching, and community interactions, the project aims to promote broader recognition and application of replication studies. This approach serves multiple stakeholders—researchers, educators, students, policy-makers, and the public—by providing tools for critical evaluation of scientific results, thereby advancing Open Science practices and ensuring the robustness of scientific research.

Title: The Replication Database as a Nexus for Replication Research

Presenters: Lukas Röseler (Münster Center for Open Science), The Replication Database Collaboration (Multiple Institutions)

For researchers to be able to communicate their replication attempts, quickly identify relevant replications, and investigate summaries and moderators of replicability, we have aggregated social scientific replication studies in a meta-analytical way. This Replication Database (https://t1p.de/ReD) is a culmination of multiple systematic efforts to collect replication findings and forms the fundament for the Replication Hub. With this hub, we provide infrastructure for researchers with a low-threshold way to publish replication studies, search a large catalog of more than 800 replicated findings, and run interactive analyses on a set of more than 1000 replication findings.

Title: Reproducibility and Replication at Scale in a Highly Selective Journal

Presenters: Stavroula Kousta (Chief Editor, Nature Human Behaviour, Springer Nature), Abel Brodeur (Founder and Chair, Institute for Replication, University of Ottawa)

Open science seeks to increase the transparency, rigor, and speed of research, partly through increasing the reproducibility and replicability of published findings. However, attempts to reproduce or replicate impactful research contributions remain largely piecemeal or unreported, preventing the ability of science to self-correct and undermining cumulative knowledge. This lightning talk will focus on the collaboration between the Institute for Replication and Nature Human Behaviour to reproduce and replicate at scale research published in the journal. In a first of its kind for a highly selective multidisciplinary journal, the initiative aims to explore how to make reproduction and replication commonplace across disciplines. It also showcases the value of collaboration among different stakeholders in promoting research culture change.

Lightning Talks G

Theme: Equity, Training, Norms

Title: Open Science Policy Co-Creation in Nova Scotia (Canada)

Presenters: Dr Maria M. Pawlowska (Visnea)

Following international experiences of problematic top-down open science policy introduction, or a lack of engagement on the topic the “Nova Scotia Open Science” project has decided to tackle the challenge differently. Over the past six months I have been developing an open science policy for Research Nova Scotia – the provincial science funder in Nova Scotia, Canada. As far as I am aware it is the first open science policy being developed for a funder in Canada. The two pillars of the work have been community outreach and data sovereignty. The project is very much centring the broad research community’s input (through a participatory policy co-creation framework) and incorporating Indigenous and Africa-Nova

Scotia – the provincial science funder in Nova Scotia, Canada. As far as I am aware it is the first open science policy being developed for a funder in Canada. The two pillars of the work have been community outreach and data sovereignty. The project is very much centring the broad research community's input (through a participatory policy co-creation framework) and incorporating Indigenous and Africa-Nova Scotian data sovereignty as an integral part of the policy. I believe that as a consequence of the rich and diverse research ecosystem in Nova Scotia, the lessons we are learning – in terms of challenges and solutions – will be applicable beyond the province and even internationally.

Title: Building Open Science Skills through Open-Source Education – An Invitation
Presenters: Elizabeth Drellich (Children's Hospital of Philadelphia)
We built a program to give biomedical researchers the data science skills and knowledge they need to do rigorous, reproducible, and transparent research. This talk will present our open-source educational resources, discuss how we have shared them with a national and international audience (including over 500 direct participants and a collaboration with the University of Botswana), and invite you to learn from, use, adapt, improve, and contribute to our ongoing work. The Data and Analytics for Research Training (DART) program was created by a team of data scientists and data science educators at Children's Hospital of Philadelphia (CHOP), with support from the National Institutes of Health in alignment with NIH Strategic Plan for Data Science. We are proud to both teach and live the principles of open science. DART's educational modules teach both open science principles, and how to use open-source software (e.g. R, Python, SQL, Git) to rigorously document analyses for maximum reproducibility. The DART program itself is also open-source, with both the materials we created and our dissemination methods available under the Creative Commons Attribution-ShareAlike 4.0 International License, meaning they are completely free for anyone to use, re-use, and remix.

Title: Open Education for Open Science: A Training Program for Biomedical Researchers in Reproducible Data Science Skills
Presenters: Rose M. Hartman (Children's Hospital of Philadelphia)
As efforts like the Year of Open Science bear fruit, more and more researchers recognize the value of transparent science. And yet, many find themselves without the skills necessary to translate those values into behavior. We designed an open online educational program for biomedical researchers (the Data and Analytics for Research Training program, DART) to provide training in reproducible data science methods using open-source software and tools. DART provides short, modular tutorials, so that learners can use their time efficiently and work on just the skills they need. We ran a study measuring DART's effectiveness, providing participants with tailored pathways of suggested learning modules to work on over 16 weeks. We asked participants to rate themselves before and after the program on both their attitudes toward open science, and their ability to actually engage in rigorous, transparent research. At pretest our participants already endorsed open science values, agreeing with statements like "Sharing my data and analysis code openly can make my science more rigorous" (96% agree), but they lacked relevant practical skills to convert those values into behavior. Participants' rating of their own skills improved from pretest to posttest, $t(252) = 16.995$, $p < .001$. Furthermore, 74% of DART participants said they learned things they can apply directly in their own research, and 87% said they intend to continue studying with the DART materials even after the program ends.

Title: Using Open Science to Build Bridges for Indian Ocean Rim Marine Scientists Across the Big Data Geoscience Divide
Presenters: Elizabeth Holmes (NOAA Fisheries, USA), Nimit Kumar (Indian National Centre for Ocean Information Services, INCOIS), Aditi Modi (Indian Institute of Tropical Meteorology), Swarnali Majumder (INCOIS), Smitha BR (Centre for Marine Living Resources and Ecology), Sourav Maity (INCOIS) Udaya Bhaskar (INCOIS)
We know that in a myriad of ways climate change disproportionately affects vulnerable communities in the Global South and that the impacts are exacerbated by a disparity in available resources. This

disparity extends to scientists' access to big data geoscience computing resources and infrastructure. Cloud-based big data geoscience is a crucial area of advancement in earth sciences and climate change research. However, training on and access to these new cloud-based approaches has been overwhelmingly in high income countries, leaving the next generation of earth scientists in Low and Middle income countries in danger of falling behind as earth data migrate to the cloud. Devising Early-Career Capacity Development in the Indian Ocean region" (DECCaD-IO) is an initiative within the UN Decade of the Ocean programme by the Early Career Scientist Network of the International Indian Ocean Expedition 2 (ECSN IIOE-2). This presentation will report on the inaugural DECCaD-IO event, the ITCOocean Hack2Week at the Indian National Centre for Ocean Information Services (INCOIS) in Hyderabad, India. This two-week Open Science event trained ~50 early career marine and ocean scientists from across India and Bangladesh in Open Science and big data using a 2i2c JupyterHub and NASA and NOAA earth data in the cloud.

Title: A Framework for Sharing Educational Data

Presenters: Gizem Solmaz-Ratzlaff (Florida State University, Center for Open Science), Robert C. Schoen (Florida State University)

Data sharing can foster transparency, reproducibility, and scientific progress. Join us as we share stories about challenges we have encountered and remedies we use to overcome those challenges as we learn to implement the open-science practice of sharing education research data. Using data from the Foundations for Success project (https://osf.io/x8ybz/) as an example, we will demonstrate how we use structures and components available through Open Science Framework (osf.io) to share data. This session will reference our recent blog post on the Center for Open Science blog and use it as a framework for the presentation. The interactive session will enable us to elaborate on some of the points in the blog post and generate related discussion with attendees.

Title: Research Community Outreach with the Open Science Team Agreement

Presenters: Sam Teplitzky (UC Berkeley + Bay Area Open Science Group)

A community-based approach to open science can serve as a model to shift the research ecosystem towards transparency, accessibility, and inclusivity. Targeting students, faculty, and staff at UCSF, Berkeley, and Stanford, the Bay Area Open Science Group (BAOSG) formed in 2021 with the goal of increasing awareness of open science and connecting researchers with tools to make the products and processes of science more equitable and reproducible. In addition to our established, recurring monthly discussions, the conveners and participants in the Bay Area Open Science Group co-created the Open Science Team Agreement in 2022 and began promoting the document throughout the Year of Open Science. The Team Agreement emerged from conversations with researchers at our institutions who were challenged to host and account for their disparate open science practices in one place. This presentation will discuss the challenges and opportunities associated with growing a regional open science community as well as the process of generating the Team Agreement. Open science isn't all or nothing – practices listed in the Open Science Team Agreement can be modified, rejected or adopted as appropriate; and conversations inspired by the BAOSG provide another opportunity for connection, reflection and promotion of open science.

Lightning Talks H

Theme: Publishing

Title: A Good Looking Policy: What Features Need to Be Included in Open Policies to Make Them Most Effective

Presenters: Monica Granados (Creative Commons), Katie Steen (SPARC), Iryna Kutchma (EIFL)

Open policies that require research outputs from funded research be made publicly accessible have a demonstrable impact on open access rates. A study from 2018 found, for example, that about 90% publications funded by the Wellcome Trust whose Open Access Policy requires "providing free, online access to published research" are open access. Funders are increasingly turning to open policies to facilitate access to the research they fund. The recently published Open Science Outlook from UNESCO found that the number of countries with open access policies has almost doubled since the adoption of the Recommendation on Open Science. But policies can differ in how they recommend or mandate outputs be made open, and consequently their efficacy can vary. In this presentation, we will review different features of open policies across a variety of research outputs. We will discuss how and why to prioritize equity and accessibility in order to achieve effective policy and use the Open Climate Campaign as a case study for affecting and implementing a good looking policy

Title: Supporting Preprint Review Through Open Community Standards

Presenters: Maria Levchenko (Europe PMC)

Preprint review offers a way to innovate research evaluation. It counts many benefits, enabling rapid bi-lateral feedback, expanding reviewers' pool to engage underrepresented communities, and supporting more equitable and accessible research. With increasing numbers of new preprint review communities, over 20 platforms currently offer tools for sharing preprint feedback. However, with preprint reviews scattered across platforms it creates a barrier to improving reviews' discoverability, enabling reviewer credit and building trust in preprints. To address this a community-endorsed open source project led by K*nowledge Futures has established the DocMaps framework for representing different review systems in a machine-readable way. It uses a standard vocabulary to record review process steps and has been adopted by preprint review aggregators, such as Sciety and Early Evidence Base. As the next step, the DocMaps workflow was incorporated into Europe PMC's preprint discovery tool, connecting preprints and their versions with existing reviews and providing a comprehensive timeline of preprint review activity. In this presentation we would like to address the importance of community-led efforts to establish standards for preprint review and the associated challenge of accommodating the diversity of emerging initiatives, while supporting interoperability and integration of preprint review into the open science infrastructure.*

Title: Teaching Transparent and Accountable Peer Review (TAP)

Presenters: Anna Hatch (HHMI, presenter), Michele Avissar-Whiting (HHMI, presenter), Iratxe Puebla (DataCite, contributed to project), Jessica Polka (ASAPbio, contributed to project), Bodo Stern (HHMI, contributed to project)

We developed a peer review training pilot where graduate students and postdocs in HHMI labs learn to conduct peer review in a manner that is constructive and transparent. Preprints are the pilot's special sauce because they allow trainees to gain hands-on experience writing peer review reports, without depending on invitations from journal editors. Public posting of reviews is a required piece of the pilot and allows us to offer something unique to course graduates: a tangible deliverable more meaningful than a certificate. One long-term outcome of the TAP program is to normalize the practice of preprint peer review. Because preprint peer reviews are posted openly in association with preprints, we stand to create a healthier scholarly ecosystem by 1) eliminating rounds of redundant, opaque peer review thus saving time and money; 2) by enabling reviewers to get recognition for these outputs, which are scholarly works in their own right; 3) expanding the reviewer pool to include the voices of those who have been traditionally excluded; and 4) by maximizing the value of peer review reports by making their content available, not only to editors and authors, but also to readers, including non-specialized audiences.

Title: PREreview: Working Together Towards a Future of Equitable and Open Peer Review for All
Presenters: Vanessa Fairhurst (PREreview), Monica Granados (PREreview), Samantha Hindle (PREreview), Daniela Saderi (PREreview), Chad Sansing (PREreview), Chris Wilkinson (PREreview, eLife)
PREreview's mission is to bring more equity and openness to the scholarly peer review process, centering the needs and expectations of researchers who have been traditionally excluded from the process. Our approach involves fostering transformative change through collaborative community efforts. In this lightning talk, we will share our values and how our past, current, and future work aligns with three Year of Open Science Goals. Specifically:

GOAL 1: Improve Transparency, Integrity, and Equity of Reviews
- We empower all researchers to provide constructive feedback on preprints.
- Our open-source platform allows anyone to compose and publish preprint reviews, challenging the dominance of closed, inequitable practices in scholarly communication.

GOAL 2: Account for Open Science Activities in Evaluations
- PREreviews receive a DOI via DataCite, are licensed CC BY 4.0, and come with standard metadata for discoverability.
- Soon, contributors can seamlessly add their PREreview contributions to ORCID profiles, enhancing validation and recognition for open science activities in CVs and biosketches.

GOAL 3: Engage Underrepresented Communities in the Advancement of Open Science
- Our success is intricately linked to engaging and centering the needs of traditionally marginalized individuals.
- We actively promote diversity by increasing racial, ethnic, and geographical representation in the peer review pool, advocating for inclusivity at every level of our organization.

Title: Signals of Trust: The Peer Review Taxonomy
Presenters: Joris van Rossum (STM Solutions)
Over recent decades, a significant number of new peer review models have been introduced (most notably for open review), but they have not been accompanied by the development of a clear and consistent nomenclature, leading to confusion. There is also increased support for more openness and transparency in science and research, including peer review. More clarity on peer review practices and standards is needed to maintain trust in the scholarly ecosystem. In 2019, STM (the International Association of Scientific, Technical, and Medical Publishers) recognized the need to support the community in ensuring greater transparency and openness in peer review, which is an essential element of open research. An STM Working Group developed standard definitions and best practice recommendations for the communication of peer review processes, which was then further developed by NISO and published as a formal ANSI/NISO standard in 2023. Initially the taxonomy is designed for peer review of journal articles, but the intention is to expand to other outputs in future (e.g., books), based on demand. This session will describe the taxonomy and recent progress on deployment and implementation across the scholarly ecosystem since its launch during the Year of Open Science.

Title: HTML at arXiv: Why Flexible Research Formats are Important for Equitable Access to Open Science
Presenters: Shamsi Brinn (arXiv), Sarah Kane (University of Cambridge)
arXiv's goal is to continually improve access to research across all communities - in 2023 | Year of Open Science, arXiv launched HTML as a format across all new papers submitted to arXiv, with the eventual goal of converting the entire arXiv corpus. People with disabilities are the world's largest minority, and currently only 2.4% of research outputs meet accessibility guidelines. In this lightning talk, Shamsi Brinn, User Experience Manager at arXiv, and Sarah Kane, PhD student in Astronomy at University of

Cambridge, will discuss how HTML on arXiv came about, why HTML papers are better for accessibility, and what more needs to be done to make all research accessible. Sarah will also speak first hand of her experiences trying to access astronomy research as a visually impaired student. We hope to raise awareness around the inaccessibility of scientific outputs, share how HTML has been a step forward, and inspire others to take steps to increase accessibility of all scientific outputs.

Organizational Stories of Successes and Challenges A

Theme: Community

Title: Using the OLS training programme as Launch Pad for NASA TOPS Open Science 101 Cohorts

Presenters: Irene Ramos (OLS), Yo Yehudi (OLS)

This presentation shares insights from eight cohorts of an open science training and mentoring program, highlighting our engagement of underrepresented communities. Since 2020, OLS has successfully delivered virtual training cohorts to empower 380+ researchers and teams to lead open projects globally. We combine practical training with 1:1 mentorship, supporting participants to apply open practices within their socio-cultural context. As "Inclusion by design" is a core principle, we offer: microgrants to assist with accessibility needs like high-speed internet, electronic devices or childcare; English-language transcription and other language considerations; asynchronous access to materials; and ally skills training. These efforts enhance participant uptake and foster continued engagement. Graduates often return as mentors and become open research ambassadors, for example, many community members participated in the NASA TOPS curriculum development team. In 2024, OLS is also delivering training cohorts for NASA's Open Science 101 curriculum. In this talk, we share recommendations for the genuine behavioural commitments and organizational changes needed to create inclusive open science spaces. We aim to steward a supportive and inclusive online community around open science, and demonstrate the alignment of our training initiatives with the incentives driving open science adoption.

Title: Increasing NASA Mission Value with Early Open Source Efforts

Presenters: Brianna Lind (NASA Land Processes DAAC), Dana Chadwick (Jet Propulsion Laboratory, California Institute of Technology), Erik Bolch (NASA Land Processes DAAC), Mahsa Jami (NASA Land Processes DAAC), Aaron Friesz (NASA Land Processes DAAC), Phil Brodrick (Jet Propulsion Laboratory, California Institute of Technology), David R Thompson (Jet Propulsion Laboratory, California Institute of Technology), Rob Green (Jet Propulsion Laboratory, California Institute of Technology), Cole Krehbiel (USGS, EROS)

In a first for the Earth Observing remote sensing community, the EMIT mission made the entire science data system – along with all individual algorithms – open source prior to the launch of the instrument. In an ideal world, all mission code would be constructed to facilitate easy transportability between systems, novel development and intercomparison, and custom applications. In practice, EMIT's early embrace of open science initially only made it part way there; however, we argue that by placing what it did in the open as early as it did, the EMIT mission facilitated widespread adoption and integration of core software pieces into new tools, documentation, and tutorials. Critically, it facilitated a close-knit interaction between the EMIT mission team, the NASA Land Processes DAAC, and early career remote sensing scientists, and is actively cultivating an open network to share knowledge, pool resources, and enable mutual success. With open science we suggest that it's better to start early with whatever is possible to build forward rapidly, rather than waiting for completion before allowing access, and that this philosophy encourages collaboration, reuse, and improvement. We show that increasing transparency as early as possible can catalyze new opportunities, diverse perspectives, and better science in less time.

Title: Transforming the JPL Research Community: Laying the Groundwork to Support a Large Organization in Open Science

Presenters: Caroline Coward (Jet Propulsion Laboratory/Caltech), Marshall Styczinski (Blue Marble Space Institute of Science), Daniel Limonadi (Jet Propulsion Laboratory/Caltech), Dan Crichton (Jet Propulsion

Laboratory/Caltech), Karen Yuen (Jet Propulsion Laboratory/Caltech), Brian Knosp (Jet Propulsion Laboratory/Caltech)
This presentation will give an overview of the developing Open Science efforts at NASA's Jet Propulsion Laboratory, from individual, isolated, and siloed activities toward a Labwide coordinated initiative. We will highlight community and infrastructure features such as JOR (our open data repository), our Labwide open science and data management plan template (built into our ROSES template), and our TOPS wiki space, as well as the JPL TOPS Team, Open Science Slack channel, our emerging open software process and conversation, and the March 2023 SPD-41a Town Hall. We will summarize various challenges faced by the JPL Open Science community regarding organizational acceptance and implementation of SPD-41a, as well as a brief discussion of the various paths JPLers take to Open Science adoption and advocacy (with a possible use to create personas for training or communication.)
We are Daring Mighty Things Openly!

Title: The Past, Present, and Future of Teaching and Mentoring Open Sciences Topics: A Perspective by FORRT
Presenters: Flavio Azevedo (University of Groningen)
As the wave of scientific reform changes research practices and norms globally, higher education has largely been left behind. While academics are increasingly adopting best practices to encourage higher standards for the quality of evidence and accessibility of research outputs (such as articles, code, research materials, etc.), we are still failing to address how we teach, mentor, and supervise students through open science. This undermines the goal of permanently redressing perverse academic incentives and research evaluations that erode research quality. In this talk, the Framework for Open and Reproducible Research Training (FORRT; forrt.org) advocates for the integration of open science into higher education, as well as generating a conversation about the downstream consequences of open science such as ethics, and the social impact of higher education focused on openness, epistemic uncertainty and pluralism, and research credibility. This includes the need for curricular reform, the development of new methods of education, and addressing questions about how open scholarship practices relate to social justice, inclusive participatory practice, and a global perspective on science.

Organizational Stories of Successes and Challenges B
Theme: Rewards

Title: Incentivizing Best Practices Through Transparent Replications: Introducing an Initiative that Rates the Replicability, Transparency, and Communicative Clarity of Studies from Randomly-Selected, Newly-Published Psychology Papers in Top Journals
Presenters: Amanda Metskas (Transparent Replications), Clare Harris (Transparent Replications), Spencer Greenberg (Transparent Replications)
We are testing a new approach to promoting open science and replicable research practices in experimental psychology. We replicate studies from randomly-selected, newly-published papers from a predefined set of prestigious psychology journals, plus all newly-published psychology papers in Nature and Science. We rate studies on their transparency, replicability, and clarity in communicating findings, and publish the results on our website. Through these ratings, we aim to reward the many teams already engaged in open science practices and encourage others to follow their lead. In this talk, we will explain our approach and its challenges, report on the first seven replications we completed, and explain how we plan to apply our methods at scale. Though the original studies were mostly transparently conducted, with findings that have mostly replicated so far, we wish to emphasize the importance of authors not only conducting transparent, replicable research, but also unambiguously communicating if and how their conclusions necessarily follow from their results. Finally, we conclude by inviting feedback, ideas, and discussion from the audience. We recognize that to truly shift incentives in psychological science, it will require many scientists working together towards this goal.

Title: The State of Open Data 2023 and US Research Landscape: Motivations and Challenges
Presenters: Graham Smith (Springer Nature)
Surveying over 6000 researchers worldwide, the report from Digital Science, Figshare and Springer Nature provides key evidence of the persisting challenges associated with open data sharing as well as future needs. The 2023 report takes a deeper dive into the survey results than previous years, identifying challenges, regional trends and making specific recommendations to different stakeholders in the research area, for example funders, institutions, publishers and researchers themselves. A key theme emerging is that one size does not fit all, which has interesting implications for the implementation of wide-ranging policies such as the Nelson memo. This presentation will examine the challenges and recommendations on data sharing practices from a regional perspective with a focus on the US, US-funded research and US-based researcher motivations and challenges.

Title: Seeding a New Generation of Open and Equitable Meta-Scientists
Contributors: Kristen Ratan (ICOR), Sue Kriegsman (MIT Libraries, Center for Research on Equitable and Open Scholarship/CREOS)
In order for institutions and funders to support research transparency and reproducibility, at the same time as improving equity and inclusion in scholarship, they need a body of evidence about what environments are proving to be successful. There is a fledgling area of study in meta-science to study policy impact, best practices, and emerging metrics in scholarship that is revealing information about openness and equity. MIT Libraries and Incentivizing Collaborative Open Research (ICOR) are partnering to investigate how to support and grow meta-science by studying issues of openness and equity in scholarship through a fellows and leadership program. With the support of a NSF EAGER grant, the partners are analyzing the current landscape, gathering input from stakeholders, and investigating what an ongoing program would require. The proposed program, Fellows and Leaders in Open and Equitable Scholarship (FLOES) would fill a gap in organizing and funding meta studies and consolidating the resulting evidence base. The goal is to seed and nurture a new generation of researchers who are empowered and trained to continue this investigation in the future.

Organizational Stories of Successes and Challenges C

Theme: Community

Title: Advancing Transparency and Collaboration: Exploring Open Science in Food and Nutrition Research
Presenters: Caitlin Karolenko (IAFNS), Marie Latulippe (IAFNS)
The Institute for the Advancement of Food and Nutrition Sciences, a 501(c)(3) non-profit organization, mobilizes government, industry and academia to drive, fund and lead actionable science for public health. Guided by core values (scientific integrity, transparency, collaboration and public benefit), we ensure that these principles shape all our actions and initiatives. We hold scientific integrity and transparency as our top priorities. When funding external projects, it is crucial to strategically ensure transparency and integrity. In this presentation, we will delve into how we integrate open science practices as a funding organization — utilizing tools from the Center for Open Science such as the Transparency and Openness Promotion Guidelines and the Open Science Framework — into our funded projects. We will also discuss the development of our own guidelines to safeguard the integrity of the research record, reflecting the broader scientific community's shift towards increased transparency and open science. Furthermore, we will explore our efforts to engage underrepresented communities in advancing research. This includes prioritizing students from underrepresented backgrounds for participation in our Summer Research Opportunity Fellowships and outreach to Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and Minority Serving Institutions (MSIs) in our Request for Proposal (RFP) process.

Title: Access to Open Science in Latin America Behavioral Science: Successes and Challenges of PSA Latin America Hub and ABRIR

Presenters: Nadia S. Corral Frías (Universidad de Sonora, México), Débora I. Burin (Universidad de Buenos Aires, Argentina – CONICET), Karla Alejandra Garduño Realivazquez (Universidad de Sonora, México), Linda Isis Garcia Estrada (Universidad de Sonora, México), Alma Jeftic (University of Copenhagen, Denmark)

Many Big-Team and Open Science networks still struggle to recruit samples and researcher leadership from the Global South. This has prompted the creation of initiatives within existing Big-Team Science networks and new consortiums, such as the Psychological Science Accelerator (PSA) Regional Hubs and Advancing Big-team Reproducible science through Increased Representation (ABRIR). In 2023, we started the Latin America PSA Hub. We hosted webinars about behavioral open science practices (e.g. use of OSF) in Spanish, specifically aimed at local scientists, with a perspective of the barriers faced in LatAm, such as language, lack of educational resources, cultural representation and sensitivity. This talk will highlight successes, challenges, and future directions in our initiative. Spanish is the world's second-most spoken native language, with the majority of speakers in Latin America. Our work seeks to not only improve access but to also take into consideration cultural and contextual issues, with talks, seminars, and activities led by LatAm Spanish speaking hosts, representing a wide regional gramatical, lexical, and pragmatic diversity.

Title: Growing an Inclusive Data Science and Open Science Community for the Aquatic Sciences

Presenters: Michael F Meyer (U.S. Geological Survey), Carolina C Barbosa (Colorado State University), Nahit S. Börekçi (Mersin University), Jonathan J. Borrelli (Rensselaer Polytechnic Institute), Tuba Bucak (Aarhus University), Kaelin M Cawley (National Ecological Observatory Network), Alli N Cramer (University of Washington), Johannes Feldbauer (Technical University of Dresden), Merritt E Harlan (U.S. Geological Survey), Robert T Hensley (National Ecological Observatory Network), Robert Ladwig (Aarhus University), Jorrit P Mesman (Uppsala University), Isabella A Oleksy (University of Colorado – Boulder), Rachel M Pilla (Oak Ridge National Laboratory), Qing Zhan (Netherlands Institute for Ecology), Jacob A Zwart (U.S. Geological Survey)

The COVID-19 pandemic drastically altered personal and professional lives. For the aquatic sciences community, field work, experiments, and even professional conferences were postponed or altogether canceled. Fortunately, increased use of video-conferencing platforms, networking and communication applications, and a newfound ease of conducting science in a virtual setting allowed for many established meetings to continue and inaugural conferences to arise. For example, a grassroots group of early career researchers established the joint “Virtual Summit: Incorporating Data Science and Open Science in Aquatic Research” (DSOS) and Aquatic Ecosystem MOdeling Network - Junior (AEMON-J) “Hacking Limnology” Workshop Series. Both events strive to gather and share developments in aquatic data science and open science, but in a setting that allows for maximum participation globally. With a focus on empowering attendees, the combined “Hacking Limnology” Workshop and Virtual Summit offer hands-on training and knowledge sharing in advanced themes, such as remote sensing, numerical modeling, workflow management software, machine learning, open data repositories, and careers in data science and open science.

With the fifth year of the virtual summit upcoming in summer 2024, the organizing team is enthusiastic to share and discuss the footprint DSOS and Hacking Limnology have created. Annually, events have attracted 436-686 registrants from over 60 countries and 6 continents, with ~60% of registrants from outside the United States. The Open Science Framework archive (https://osf.io/682v5/) currently houses over 40 hours of advanced and over 20 hours of introductory training material. With a focus on creating a space that welcomes community members from diverse technical and cultural backgrounds, the organizational team is committed to ensuring this community remains an open space where interested individuals can exchange ideas, expand their skills, and widen their peer network.

Title: User Engagement in the NASA Science Explorer (SciX) Open Science Initiative
Presenters: Jennifer Lynn Bartlett (NASA Science Explorer, SciX), Stephanie Jarmak (NASA Science Explorer, SciX)
Drs. Stephanie Jarmak and Jennifer Lynn Bartlett will jointly present on the transformative journey undertaken by the Astrophysics Data System (ADS) during the Year of Open Science. In 2023, the ADS research discovery platform underwent significant expansion, covering all research areas under NASA's Science Mission Directorate, leading to its successful relaunch as the new NASA Science Explorer (NASA SciX). With a strategic focus on engaging new users within our expansion communities while maintaining strong connections with the established Astrophysics user base, this presentation will delve into NASA SciX's community engagement successes and challenges. Drawing on insights gathered from surveys, user group discussions, and conferences, the presentation outlines NASA SciX's user-centric innovation, ensuring the preservation of ADS strengths while pioneering new avenues for NASA's open science discovery. Attendees will gain valuable insights into NASA SciX's collaborative approach, organizational successes, and lessons learned. Finally, the presentation will introduce our audience to the NASA SciX Ambassador program, designed to elevate awareness and utilization of NASA SciX among our open science partners and new user groups.

Organizational Stories of Successes and Challenges D

Theme: Infrastructure

Title: The Coopetition Model of Collaboration in the NIH Generalist Repository Ecosystem Initiative
Presenters: Traci Snowden (Elsevier), Ana Van Gulick (Figshare), Ishwar Chandramouliswaran (NIH ODSS), John Chodacki (CDL/Zenodo)
The NIH-ODSS-funded Generalist Repository Ecosystem Initiative (GREI) brings together seven generalist repositories (Dataverse, Dryad, Figshare, Mendeley Data, Open Science Framework, Vivli, Zenodo) to enhance support for NIH data sharing and discovery. "Coopetition" (i.e., cooperation + competition) is a key component of GREI, invoked to describe the participating repositories' collaboration to advance functionality and bolster data sharing and reuse. Though they are a mix of nonprofit and for-profit organizations running both open source and proprietary software-based repositories, all GREI repositories support FAIR data sharing across disciplines, strive to adhere to repository best practices, and leverage community standards. The GREI coopetition fosters the development of a cohesive and interoperable generalist repository landscape supportive of flexible data sharing and cross-repository discoverability, while enabling the repositories to offer unique features (e.g., visualization and analysis, tool integrations, custom metadata). In the NIH context, GREI continues to prove that there are benefits and opportunities to global repositories working together to meet the needs of research communities, funders, and institutions. The success of the GREI model may interest other research infrastructure providers, who may consider adopting some of the common GREI capabilities to reduce barriers to data sharing and support greater interoperability across the repository landscape.

Title: Advancing Open and FAIR Research Ecosystems: OpenAIRE's Case Study in EOSC
Presenters: Natalia Manola (OpenAIRE), Elli Papadopoulou (OpenAIRE)
The European Open Science Cloud (EOSC) is implementing Open Science in Europe with the vision to offer the "web of FAIR data and services" as the seamless and open environment for researchers, innovators, and citizens to access, share, and reuse data across borders and disciplines. In this context, the Open Science Trails (OSTrails) project aims to empower the research community by establishing an interconnected pan-European knowledge ecosystem and the pathways that enhance FAIRness and machine actionability in the planning, tracking and assessing phases of research. OpenAIRE contributes through the following services: PLAN: ARGOS for creating, managing and publishing machine actionable Data Management Plans (DMPs); TRACK: Graph for providing rich contextual information about research

activities and scholarly communication; ASSESS: Validator for assessing FAIRness of (meta)data and repositories. This presentation portrays the preparations towards plan-track-assess pathways in OpenAIRE for services to interoperate and capture complete and accurate information, perform assessments across the different stages and automate research processes. It will start by providing the limitations in Scientific Knowledge Graphs (SKGs), DMPs and FAIR assessments today, to then highlight how the services of ARGOS, Graph, Validator enrich the landscape, and conclude on case studies in different settings and countries of OpenAIRE members.

Title: The NF Open Science Initiative: Accelerating Research in Neurofibromatosis
Presenters: Christina Conrad (Sage Bionetworks), Irene Morganstern (Children's Tumor Foundation), Jineta Banerjee (Sage Bionetworks), Anh Nguyet Vu (Sage Bionetworks), Efrén Muñoz (Gilbert Family Foundation) , Kalyan Vinnakota (Gilbert Family Foundation), Sang Y Lee (Neurofibromatosis Therapeutic Acceleration Program), Jaishri Blakeley (Neurofibromatosis Therapeutic Acceleration Program), Annette Bakker (Children's Tumor Foundation), Robert Allaway (Sage Bionetworks)
The NF Open Science Initiative (NF-OSI) is an effort focused on accelerating the study of neurofibromatosis (NF) by sharing data with the broader community. The NF-OSI is the result of a collaboration between a number of NF-focused foundations/programs. The NF-OSI built and maintains the Neurofibromatosis (NF) Data Portal, a space for NF researchers to share, find, and re-use original research data and information about research tools. Sharing data can spark collaborative opportunities and accelerate scientific progress by improving the speed and accuracy of the research pipeline. Since 2016, the NF Data Portal has grown to host data for >20 initiatives supported across 5 funding agencies, >230 studies, >38,000 files encompassing 75 distinct types of assays, and >1000 research tools that altogether equate to over 210 terabytes of content. Overall, ~46 versions of the metadata dictionary have been released. The NF data portal has enabled research leading to >140 publications. We have also built interoperability infrastructure to coordinate the exploration of data in external analysis portals like cBioPortal and analysis platforms like CAVATICA. In conclusion, the NF Data Portal is a reliable option to share data responsibly and optimize the data utility for the benefit of NF patients.

Title: Global Open Research Commons: A Model for Improved Interoperability and Collaboration
Presenters: CJ Woodford (World Data System International Technology Office)
Open Science Commons provide a shared virtual space for data and services. The Research Data Alliance Global Open Research Commons Interest Group (RDA GORC-IG) is working to support coordination amongst national, pan-national and domain specific organizations as they build interoperable resources necessary to enable researchers to address societal grand challenges. The realized vision of GORC will provide frictionless access to all research artifacts to everyone, everywhere, at all times, with the appropriate infrastructure, protocols, and support. The RDA GORC International Model Working Group (RDA GORC-WG) has analyzed a range of existing commons to collect and curate a set of considerations and key performance indicators for building open science infrastructure. From this analysis, the WG has created a non-prescriptive Commons model that simultaneously provides a common language to describe aspects of a commons and to identify areas of priority. In this presentation, I will provide an overview of the model and mechanisms for strategic planning, gap analysis, and benchmarking regarding open science. Participants will trial using the model and contribute to a discussion on practical implementations. Elements of consideration covered by the model include governance and policy as well as technology and infrastructure, interwoven with the FAIR, CARE, and TRUST principles.

Organizational Stories of Successes and Challenges E

Theme: Policy

Title: Responding to the Nelson Memo: Investigating Cost and Price in OA Data and Publishing

Presenters: Gail Steinhart (Invest in Open Infrastructure), Lauren Collister (Invest in Open Infrastructure), Katherine Skinner (Invest in Open Infrastructure)

The 2022 Nelson memo, "Ensuring Free, Immediate, and Equitable Access to Federally Funded Research," presented a number of challenges to researchers, publishers, and librarians, one of which is understanding what constitutes "reasonable publication costs and costs associated with submission, curation, management of data, and special handling instructions." New research by Invest in Open Infrastructure (IOI) seeks to advance our understanding of the reasonable costs of compliance with funders' emerging policies. First, in this session, we will share our initial findings related to the difference between "allowable costs" and "reasonable costs", as well as the difference between the cost and the price of the work enumerated in the memo. Another key component of our NSF-funded research, "Investigating Reasonable Costs," is engaging a spectrum of viewpoints, including those of five core groups: sponsored research offices, libraries, publishers, scholarly societies, and data management and scholarly communication infrastructure providers. In this session, we will share our initial findings regarding how these five stakeholder groups currently are preparing for the 2026 policy implementations, including what questions they are fielding from researchers, and what elements go into their equations of what it costs to make research outputs publicly accessible.

Title: Open Science Policy Implementation and Progress at the EMBL

Presenters: Victoria Yan (European Molecular Biology Laboratory), Bastian Drees (European Molecular Biology Laboratory)

In 2022, the European Molecular Biology Laboratory(EMBL) implemented a new Open Science Policy, with guidelines for publications, data, software, and research assessment. EMBL established a support team to develop an Open Science strategy, which aligned outreach, infrastructure, and evaluation initiatives. To monitor progress, we integrated a policy checkpoint in a central publication workflow, which tracks and recognizes research outputs other than journal publications. We will present our monitoring framework and results over the last two years. Our monitoring framework is simple and leverages open research information databases. We believe actively monitoring and demonstrating momentum in Open Science adoption can further normalize and incentivize the adoption of open and FAIR practices. In addition to quantitative progress tracking, we are interested in delving further into the impact of the Open Science policy on diverse aspects such as technology transfer, accessibility, inclusion, and equity. Our work aligns closely with the conference themes, as we aim to share insights gained from promoting open science at an international research institution.

Title: The Patient-Centered Outcomes Data Repository (PCODR): Implementing PCORI's Data Sharing Policy to Accelerate Patient-Centered Research

Presenters: Jason Gerson (PCORI), John Audley (PCORI), Erin Holve (PCORI)

Approved in 2018, the Patient-Centered Outcomes Research Institute's (PCORI) Policy for Data Management and Data Sharing was among the first to require certain health research awardees to systematically create and preserve research data and data documentation for data sharing. This effort supports PCORI's mission to fund patient-engaged research and make patient-centered comparative clinical effectiveness research available to the public. Selecting the Inter-university Consortium for Political and Social Research (ICPSR) as PCORI's designated data repository partner to develop the Patient Centered Outcomes Data Repository (PCODR) was an essential step to speed implementation of the policy. With a critical mass of research studies now included in PCODR, PCORI has a unique perspective on operationalizing data-sharing activities for PCORI-funded awardees. This session will present an

overview of the policy's goals, and a more granular discussion of lessons learned from the implementation experience. The proposal will also highlight a new outreach effort to enhance PCODR's visibility and uptake, including key questions about strategies to engage patients and community members in open science. Attendees will gain knowledge about the development and execution of health research data-sharing initiatives for a funding organization, a topic that is increasingly relevant as more funders adopt open science practices.

Title: Open Science for Inclusive, Sustainable, and Transformative Climate Innovation
Presenters: Julia Kostova, PhD (Director of Publishing and Head of the U.S. Division at Frontiers)
During the COVID-19 pandemic, the world witnessed the power of open science to supercharge innovation to address global crises. Solutions that meet core human needs – and that are based on openly available evidence – can be developed faster, deployed more readily, and accepted more widely by the public. Today we face existential threats related to climate change that require innovative solutions, public consensus to act, and political will. Open science is our best chance to meet the urgency of managing climate tipping points. In response, the Frontiers Research Foundation has launched the Open Science Charter, calling upon the scientific community – governments, research institutions, funders, and citizens everywhere – to support mandatory open access to all publicly funded scientific knowledge by 2030. As NASA culminates its Year of Open Science, this panel discussion will highlight how the promise of the Open Science Charter can be accelerated if universities, funding agencies, and governments work together to introduce policies and legislation that recognize the public's inherent right to freely access all publicly funded scientific research.

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Sources - This code of conduct was adapted from the code adopted by The Society for the Improvement of Psychological Science (SIPS) in 2019 (http://improvingpsych.org/sipsinaction/code/), which itself uses language and concepts adapted from: Aurora, V., & Gardiner, M. (2019). How to Respond to Code of Conduct Reports. https://files.frameshiftconsulting.com/books/cocguide.pdf

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