

The Workflows Community Initiative

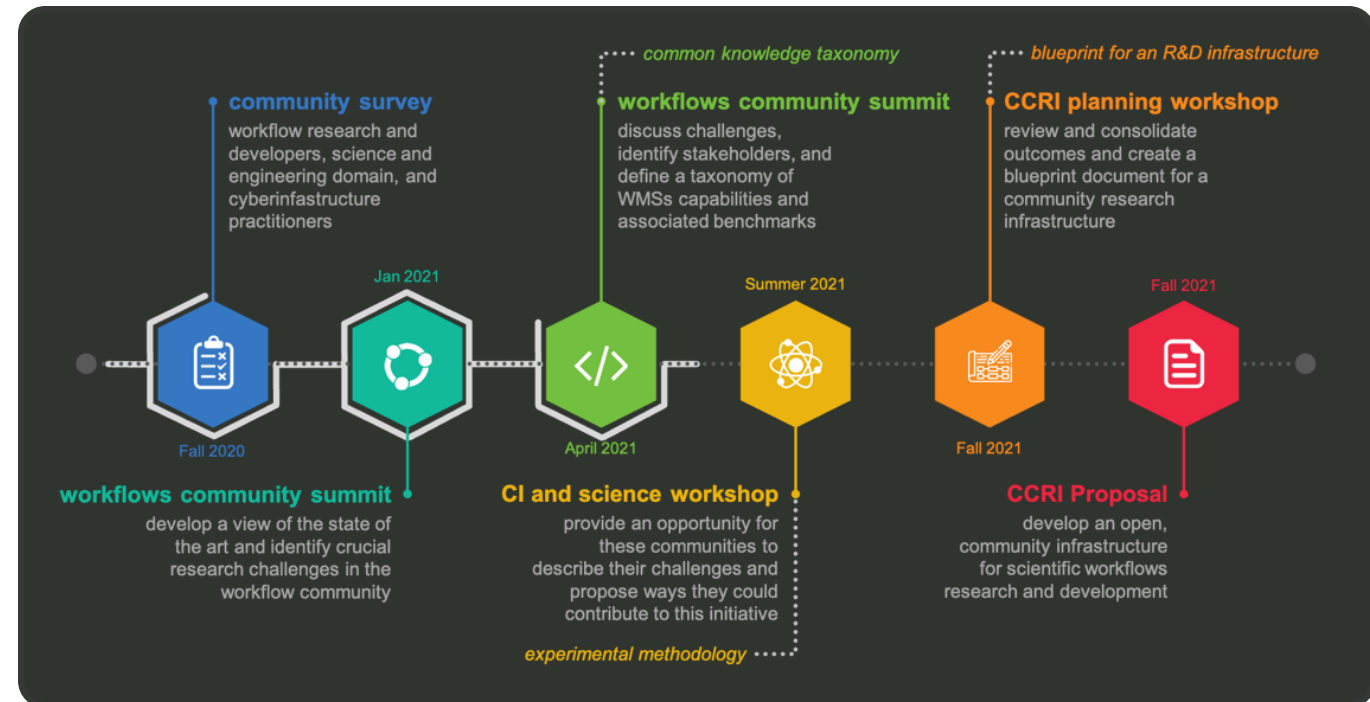
RAFAEL FERREIRA DA SILVA
GROUP LEADER
NATIONAL CENTER FOR COMPUTATIONAL SCIENCES



The Dawn of the Workflows Community

Gathering the community

These projects brought together 130+ experts from 30+ workflow systems to identify challenges, define a shared vision, and publish recommendations for advancing community infrastructure



The Workflows Community Initiative



Since 1987 - Covering the Fastest Computers in the World and the People Who Run Them

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The HPCwire CLASS OF 2025

ORNL and UChicago Lead the Launch of Unique Workflows Community Platform

March 28, 2022

March 28, 2022 — A volunteer team of researchers led by Rafael Ferreira da Silva of the U.S. Department of Energy's Oak Ridge National Laboratory (ORNL) and Kyle Chard of the University of Chicago (UChicago) has launched the Workflows Community Initiative (WCI), a platform that aims to provide a centralized source for resources, training, workshops, job opportunities, and news to scientists and developers working with workflows. The WCI currently has 68 members and is managed by a nine-person leadership team, a steering committee, and a technical lead representing 24 companies and institutions from around the world.

Scientific workflows are the automated processes used to organize, process, and manage data as it moves through computational analysis. Efficient workflows are essential to modern high-performance computing, in which scientists can process terabytes of data, but so far their research and development has largely taken place at the individual or small-team level without a focus on extended collaboration and reproducibility. Ferreira da Silva and Chard founded the WCI to solve this problem.

"What happens is that every person finds a solution that works for them, but nobody can reproduce the work. We want to reduce the number of systems that are developed every single day and increase interoperability, collaborations, and reproducibility," Ferreira da Silva said. "The goal is bringing the community together—for people to have a common place to find information about what is happening with workflows and what the community is focused on."



The Community in Numbers

36

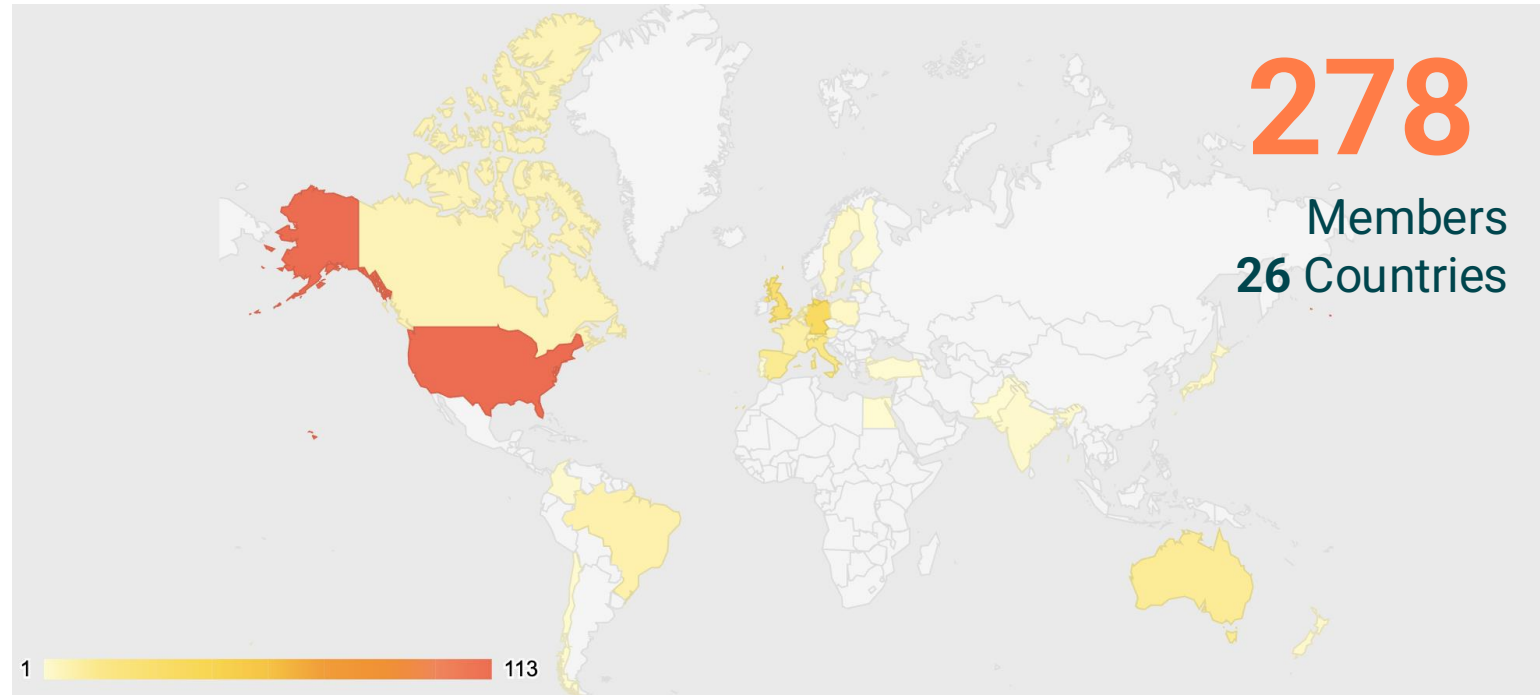
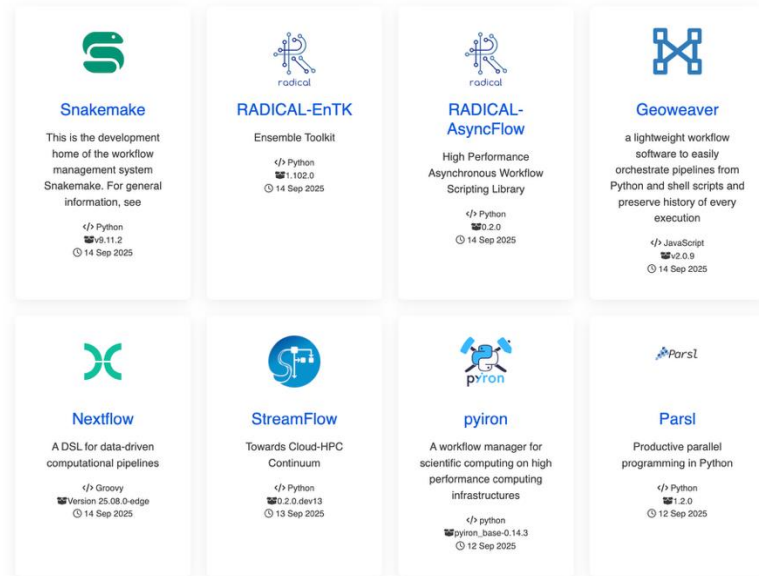
Open-Source
Workflow Systems

14 Events

Including BoFs, Summits,
Workshops, etc.

650+

Users in our Slack channel



Working Groups

FAIR Computational Workflows

The working group is seeking workflow developers and users to directly inform the standards, processes and recommendations that make computational workflows FAIR

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Article | [Open access](#) | Published: 21 May 2025

WorkflowHub: a registry for computational workflows

[Ove Johan Ragnar Gustafsson](#), [Sean R. Wilkinson](#), [Finn Bacall](#), [Stian Soiland-Reyes](#), [Simone Leo](#), [Luca Pireddu](#), [Stuart Owen](#), [Nick Juty](#), [José M. Fernández](#), [Tom Brown](#), [Hervé Ménager](#), [Björn Grüning](#), [Salvador Capella-Gutierrez](#), [Frederik Coppens](#) & [Carole Goble](#) ✉

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Applying the FAIR Principles to computational workflows

[Sean R. Wilkinson](#) ✉, [Meznah Alogalaa](#), [Khalid Belhajjame](#), [Michael R. Crusoe](#), [Bruno de Paula Kinoshita](#), [Luiz Gadelha](#), [Daniel Garijo](#), [Ove Johan Ragnar Gustafsson](#), [Nick Juty](#), [Sehrish Kanwal](#), [Farah Zaib Khan](#), [Johannes Köster](#), [Karsten Peters-von Gehlen](#), [Line Pouchard](#), [Randy K. Rannow](#), [Stian Soiland-Reyes](#), [Nicola Soranzo](#), [Shoaib Sufi](#), [Ziheng Sun](#), [Baiba Vilne](#), [Merridee A. Wouters](#), [Denis Yuen](#) & [Carole Goble](#)

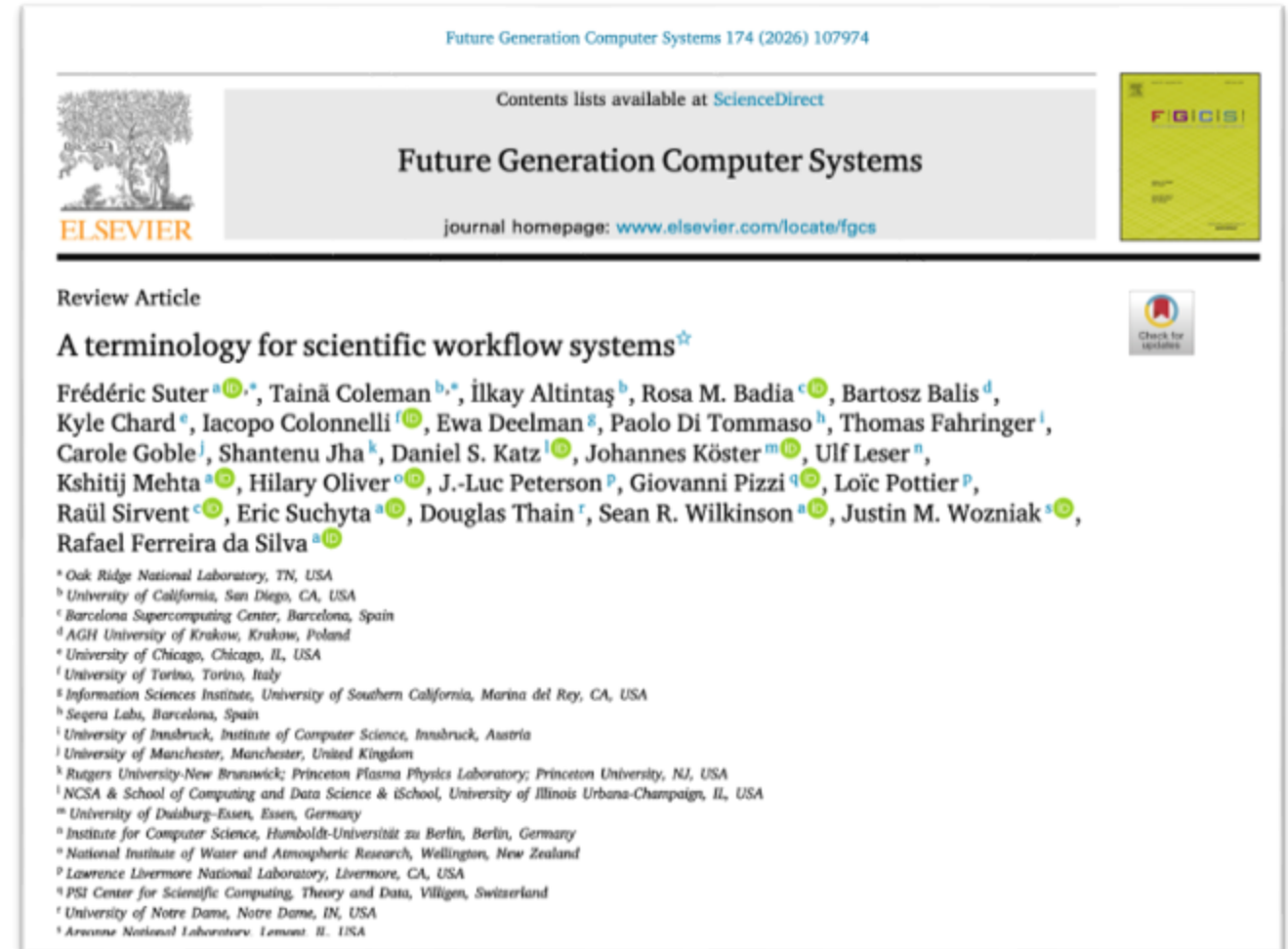
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Working Groups

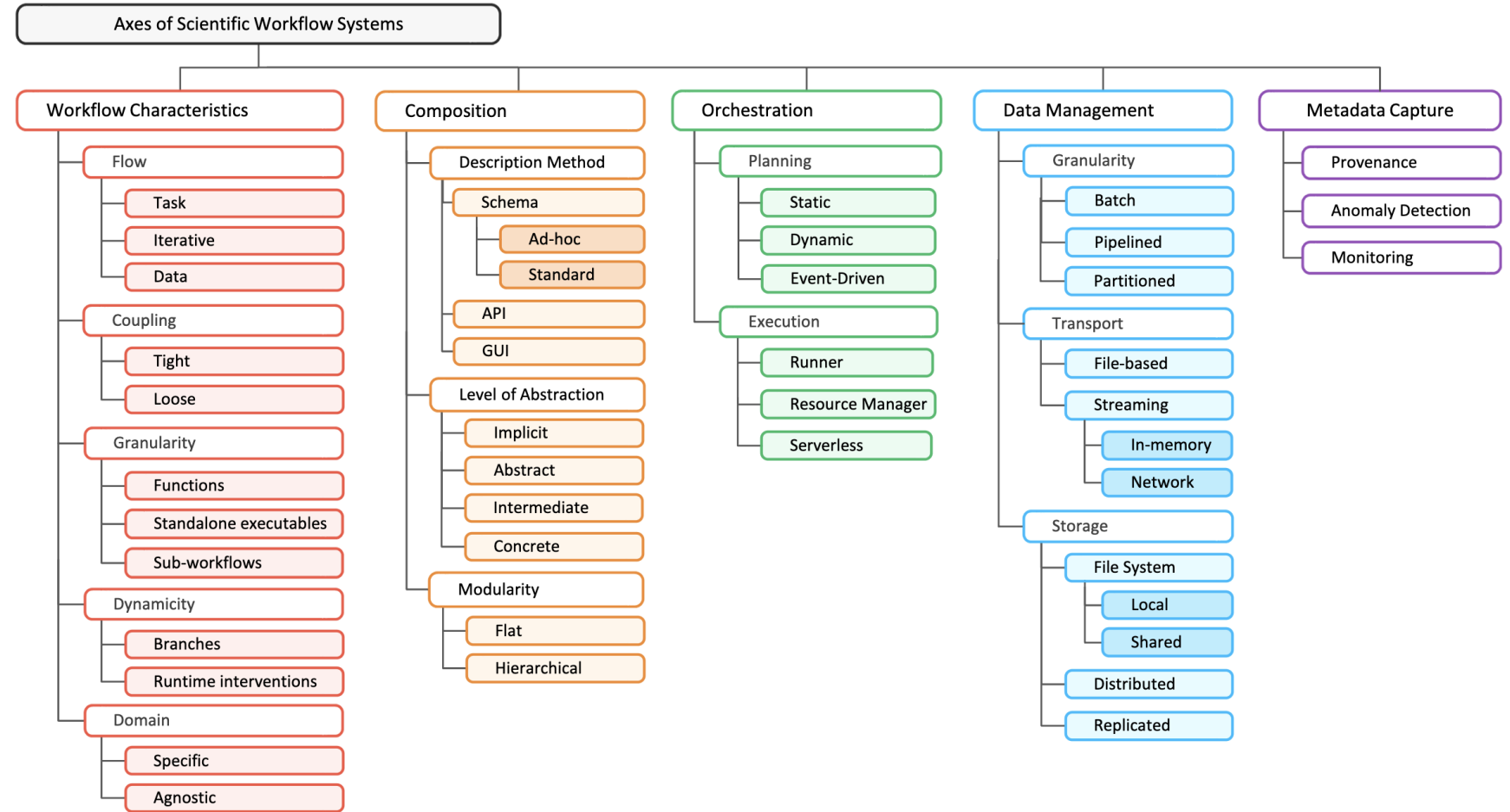
Scientific Workflow Systems Terminology

This working group addresses a critical challenge facing the scientific computing community: navigating the vast and fragmented landscape of 300+ available workflow management systems (WMSs)



Terminology

A Community-Driven Framework for Systematically Characterizing and Comparing Workflow Management Systems



Workflows Community Summits

TIME-SENSITIVE

- Secure, real-time data movement across facilities
- Standardized cross-facility authentication

AI-HPC CONVERGENCE

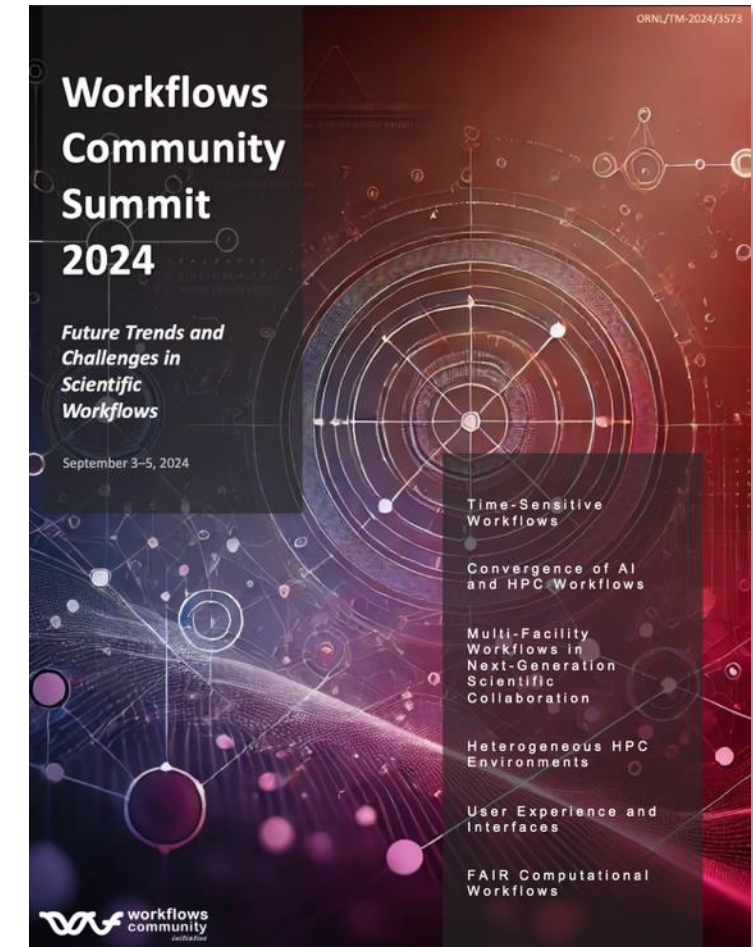
- Automated workflow optimization
- Zettaflop-scale computation for LLMs

MULTI-FACILITY INTEGRATION

- Distributed-by-design workflow models
- Cross-facility resource orchestration

USER EXPERIENCE

- Intuitive interfaces across workflow systems
- FAIR workflow practices and maturity models



Workflows Community Summit 2024

Future Trends and Challenges
in Scientific Workflows

Workshop Report – September 3-5, 2024

<https://doi.org/10.5281/zenodo.13844759>



Workflows Community Summit 2025 – Amsterdam

CRITICAL DEVELOPMENT AREAS

The convergence of **serverless** and **edge-to-cloud** workflows

Practices for **AI-driven computation**

The integration of **quantum** and **classical resources**

Application-centric **Infrastructure Design**

Human-centered approaches & **Policy** reform



Workflows Community Talks

Monthly virtual series of **30-minute talks** bringing together members of the Workflows community and anyone interested in the field

Organized by:
Stephen Hudson (ANL), Daniela Cassol (LBNL)



WORKFLOWS COMMUNITY TALKS

Teaching workflow systems to new users: why is it so hard?

Workflow systems as mirrors of computing complexity






September 24, 2025
11am PST
2pm EST
20:00 CEST

C. TITUS BROWN
University of California Davis

workflows community initiative

Workflows Community Talks ▶ Play all

The Workflow Community Talks are a monthly virtual series of 30-minute talks bringing together members of the Workflows community and anyone interested in the field...

 <p>Architecting the NERSC...</p> <p>Workflows Community 113 views • 1 month ago</p>	 <p>WorkflowHub: A Registry fo...</p> <p>Workflows Community 87 views • 1 month ago</p>	 <p>Automating Scientific...</p> <p>Workflows Community 112 views • 3 months ago</p>	 <p>Science Networks:...</p> <p>Workflows Community 96 views • 4 months ago</p>	 <p>Steering Workflows with...</p> <p>Workflows Community 165 views • 4 months ago</p>
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Join Us at SC25

BIRDS OF A FEATHER SESSION

WORKFLOWS COMMUNITY

Bridging Intelligent Workflows with Quantum and HPC for Scientific Discovery

Tuesday - Nov 18, 2025 12:15pm–1:15pm CT (Expected)

<https://workflows.community/bof/sc25/>



RESEARCH PAPERS

XLOOP 2025

AI Agents for Enabling Autonomous Experiments at ORNL's HPC and Manufacturing User Facilities

Rosendo, et al.

WORKS 2025

The (R)evolution of Scientific Workflows in the Agentic AI Era: Towards Autonomous Science

Shin, et al.

LLM Agents for Interactive Workflow Provenance: Reference Architecture and Evaluation Methodology

Souza, et al.



Thank You!

Questions?

Rafael Ferreira da Silva

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Workflow and Ecosystem Services Group
National Center for Computational Sciences
<https://rafaelsilva.com>

