

INFORMATICS EUROPE

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Open Science Workshop

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INFORMATICS EUROPE

Tackling shared challenges. Supporting policy-making.
Shaping the future of our discipline

Open Source Software as a Foundation for Open Science in Informatics

Strategies for Research, Teaching & Infrastructure

Presenters

Ulrike Lucke (UP), Boris Baldassari (Eclipse),
Michael Goedicke (UDE)
with input from and Ina Schieferdecker, Gregor Engels
and Michel Chaudron

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Welcome & Session Overview

Motivation

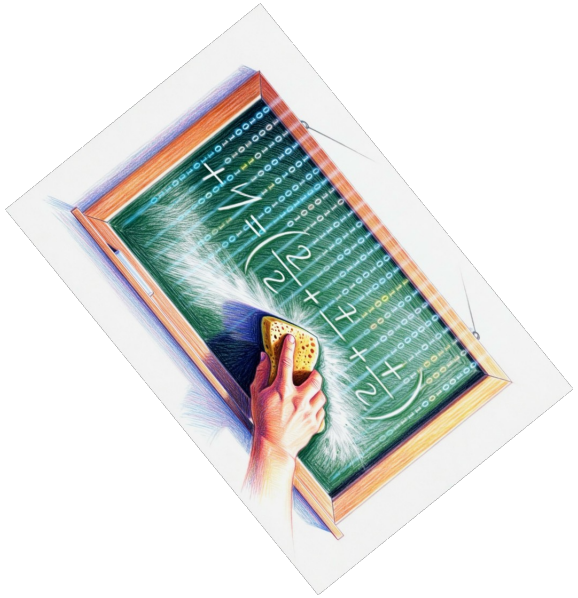
- Theme: Open Source Software (OSS) as a strategic asset
- Focus: How institutions and associations can build ecosystems for OSS
- Format: World Café 4 tables
- Ground Rule: Respect, curiosity, and a commitment to actionable ideas
- Lightning Talks
- World Café Rotation
- Synthesis & Closing

Motivation

Open Science, Open Source, …

- Research Integrity, Credible Science
- Publication processes
- Traceability of Science …
- Role of Software in Science

→ Thus Software must be Open as well



Open Source Software (OSS) is not just a tool—it's a strategic asset for research integrity, reproducibility, and innovation in informatics.

Research (& Teaching) Integrity and Open Source

- In Informatics (CS) Software is a predominant research topic and a research tool as well
  - Algorithms, Models, Software Engineering, Distributed Systems … Hardware Description languages
  - Analysis Pipelines, Workflows, Presentation
- Integrity for both areas requires source code to be open →
  - transparency, peer review, reuse, and long-term sustainability
  - without open code, research cannot be verified … even with open dataTreating OSS as a research output—not just a means to an end—is essential for research integrity

Treating OSS as a research output is essential for research integrity

Teaching with Open Source: Building Skills for the Future

- Given the shift in competencies due to the use of (agentic) AI coding techniques
  writing code → reading and checking code
  program development → systems development
- OSS is the perfect scenario for teaching

  → Students must learn to read, change and use, contribute to, cite open software
  → Checking qualitative and quantitative properties of complex software systems
- Challenges: higher level competencies need more time, new AI based software development tools are complex

Teaching open science through OSS prepares students for real-world research and collaboration

Infrastructure & Sustainability
Building Ecosystems for OSS (for Research & Teaching)

- OSS requires broader competencies in software development: architecture, version management, quality assurange, community management
- Complex Tool landscape: GitLab or similar, CI/CD, using containerization, software registries (e.g., Zenodo, Software Heritage), and code repositories
- Challenges: burnout, lack of funding, unclear ownership
- Institutional support: software hubs, developer roles, shared infrastructure, and long-term funding models

Sustainable OSS requires institutional investment not just individual effort.

Strategic Leadership
Institutional & Association Roles in Advancing OSS

- Recognize OSS in promotion, tenure, and funding (e.g., software citations, community impact)
- Develop policies that mandate or incentivize open code and data
- Create shared platforms: institutional software repositories, training hubs, and collaboration networks
- Advocate for equitable access and global participation in OSS communities

Leadership is not about tools
it's about culture, values, and long-term vision

Table 1:
Open Source Software
The Engine of Open Science in Informatics

***Focus*:**

Why OSS is foundational to trustworthy, reproducible, and collaborative research.

Discussion Prompt (Research & Software):

"How can we ensure that open source software is treated as a legitimate and valued research output in evaluation (e.g., tenure, grants)? What practices support sustainable, high-quality OSS in research?"

Table 2:
Teaching with Open Source – Building Skills for the Future

Focus:

Integrating OSS into education as a core competency.

Discussion Prompt (Teaching & Learning):

“How can we embed OSS practices into informatics curricula? What support do educators need to teach software development, collaboration, and open contribution? How does AI (not only generative / agentic) change the equation”

Table 3:
Infrastructure & Sustainability
Building Ecosystems for OSS

Focus:
The Technical and Organizational Infrastructure Needed to Support OSS at Scale.

Discussion Prompt (Infrastructure & Sustainability):

“What infrastructure or support models could your institution or association implement to sustain open source software in research and teaching? How to organize the various support layers: local, regional, national and international layers”

Table 4:
Strategic Leadership
Institutional & Association Roles in Advancing OSS

Focus:

How institutions and scientific associations can lead the shift toward OSS-driven open science.

Discussion Prompt (Strategy & Leadership):

“What one policy, initiative, or partnership could your institution or association launch to advance open source software in informatics?”

World Café Rotation

- Participants rotate every 15 minutes among the 4 tables
- Each table has a facilitator and a notetaker
- Discussion prompts are posted at each table
- After each round, participants share key insights with the larger group (1–2 min per table)

Synthesis & Closing

- Facilitators summarize top insights from all tables
- Identify 3-5 strategic actions
- Share it in your network
- Commit to an action