



# **Open Science Policy & Implementation** **LHC Reinterpretation Forum**

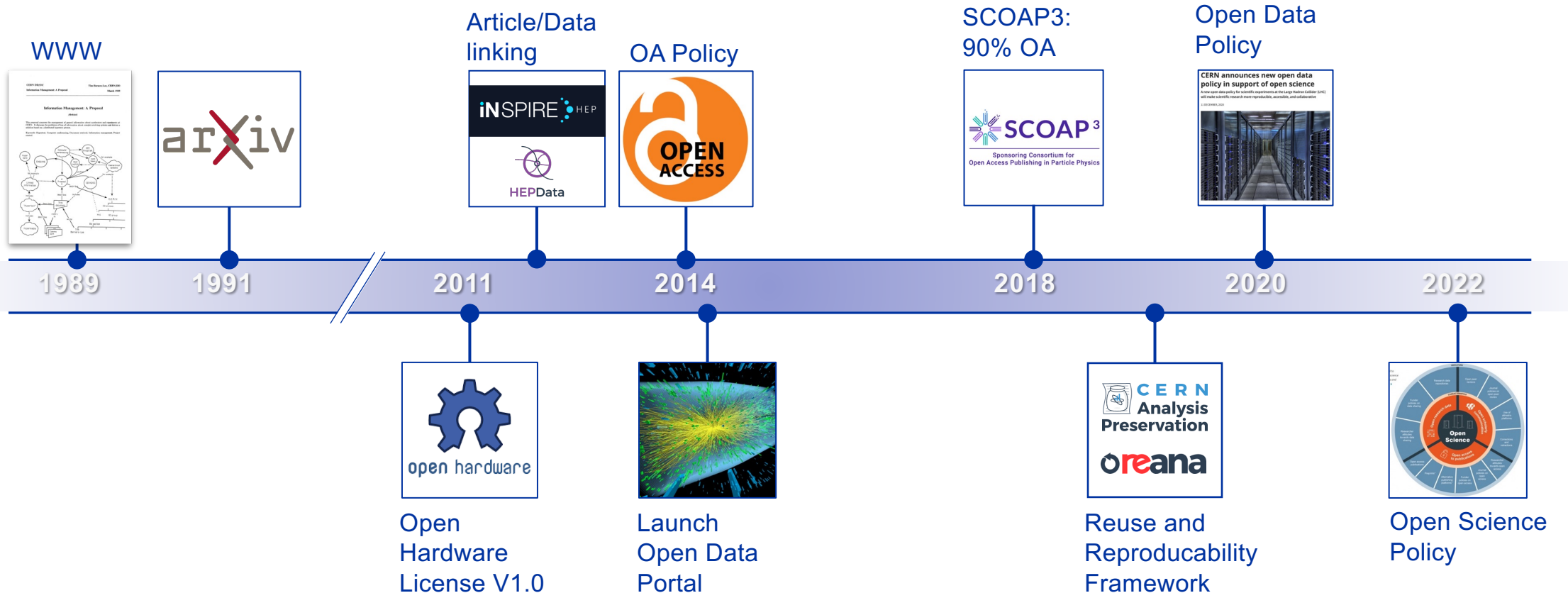
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December 2022

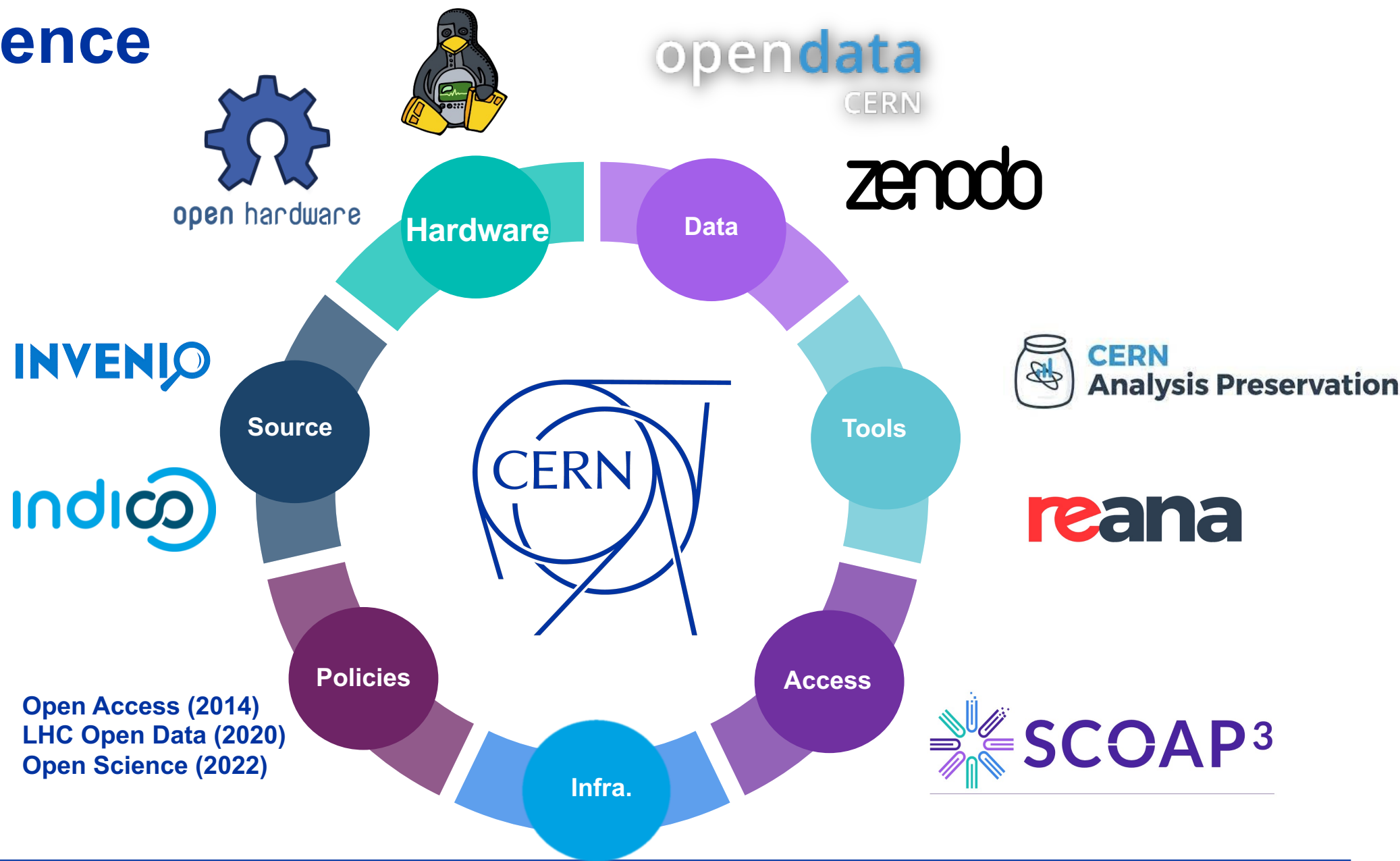
# Agenda

- | OS Policy – where does this come from?
- | Elements of the OS Policy
- | Open Science Implementation Plan
- | What is next?

# CERN – on the path to Open Science



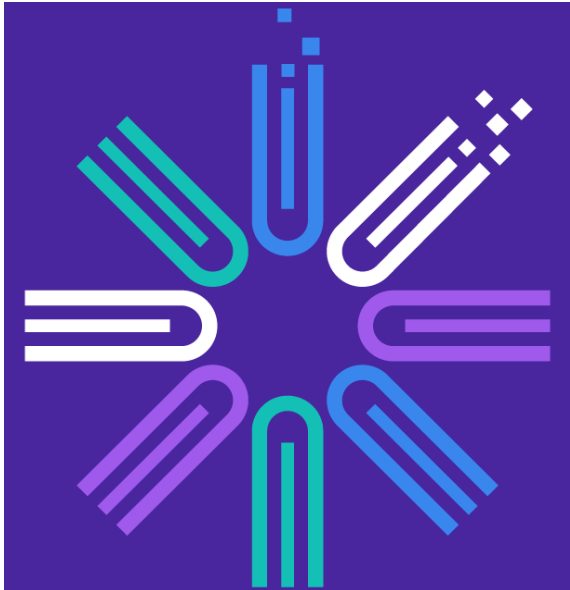
# Open Science at CERN



# Policy framework for Open Science at CERN

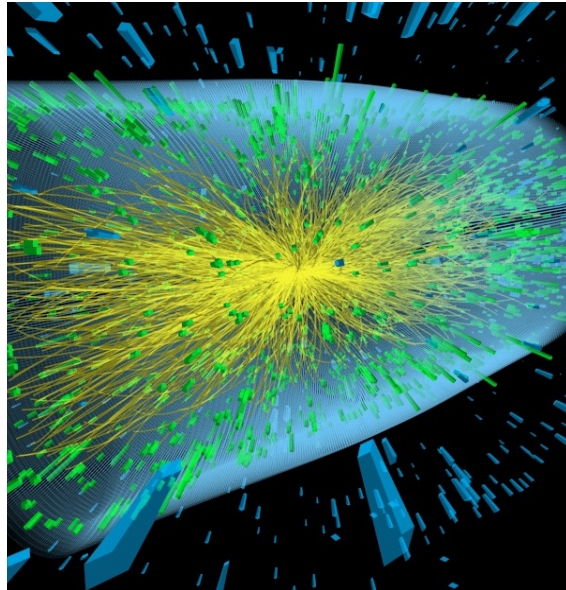
## CERN Open Access Policy (2014)

- All CERN research articles published OA (CC-BY)
- Central fund available
- Different routes (SCOAP<sup>3</sup>, Read & Publish, APC payment)



## LHC Open Data Policy (2020)

- 4 LHC collaborations will release all level 3 data (+ level 1 and 2)
- Gradual release will start ~5 years after collection
- Other experiments to follow



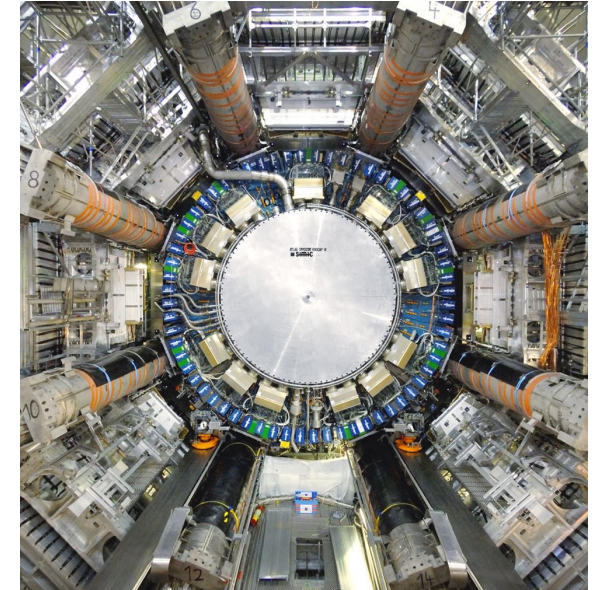
## CERN Open Science Policy (2022)

- Open... ○ Access ○ Hardware  
○ Data ○ Software
- Reusability & reproducibility
- Research Assessment
- Education & Outreach



## Funder Open Science Policies

- Funding agencies supporting experimental collaborations have specific open data requirements
- CERN will establish central support office for compliance



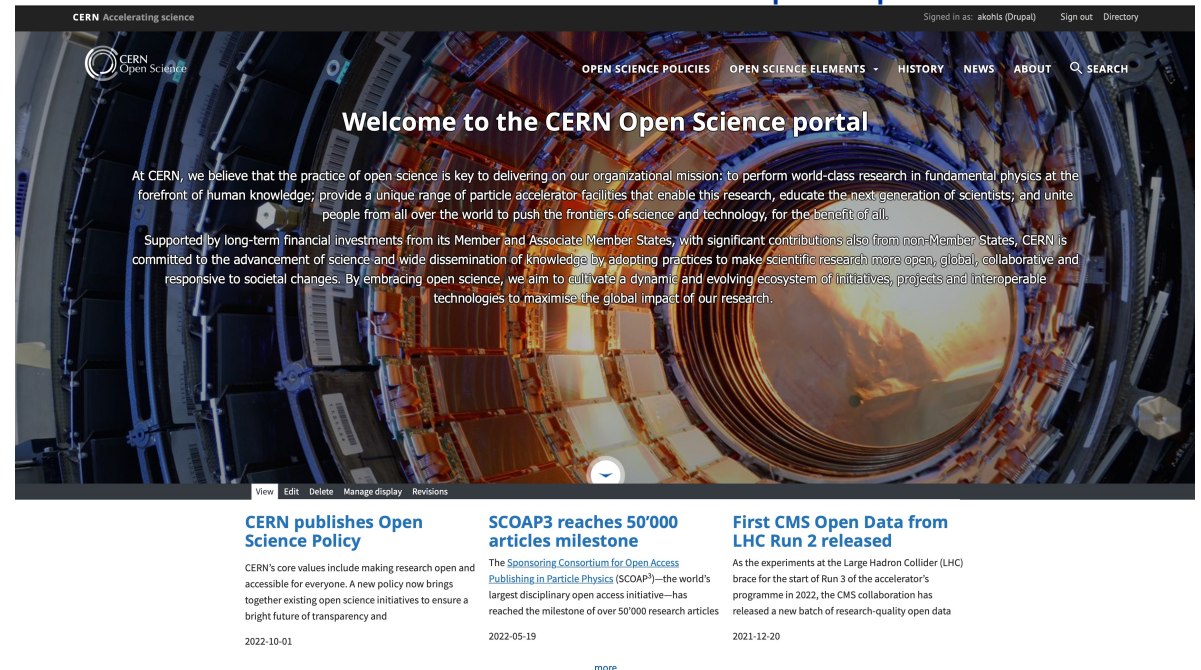


# CERN Open Science Policy in place

After 12 months of consultations and collaborative drafting, CERN's first institutional Open Science Policy was formally adopted.

- 23<sup>rd</sup> August: Enlarged Directorate presentation
- 14<sup>th</sup> September: Fabiola signs off final policy version
- 29<sup>th</sup> September: Policy presented to CERN Council
- 1<sup>st</sup> October: Policy formally in place

<https://openscience.cern>



# CERN Open Science Policy in brief

- Captures current practice and states vision across multiple Open Science domains:
  - Open Access to Publications
  - Open Research Data
  - Open Software
  - Open Hardware
  - Research Integrity, Reuse & Reproducibility
  - Infrastructure for Open Science
  - Research Assessment & Evaluation
  - Education, Training & Outreach
  - Citizen Science
- Policy to be regularly updated to reflect changes in landscape, practices, funder requirements & community demands
- V1.0, Oct 2022: <https://cds.cern.ch/record/2835057>

# Members of the working group (Dec 2022)

- Joachim Mnich (CERN Director for Research and Computing)
- Pippa Wells (Deputy Director for Research and Computing)
- Alex Kohls (CERN Scientific Information Service)
- Axel Naumann (SFT Group in the Experimental Physics Department)
- Bob Jones (Deputy Department Head CERN IT)
- Christopher Parkinson (non-LHC Experiments)
- Clemens Lange (CMS Experiment)
- Dietrich Liko (CMS Experiment)
- Francesco Prino (ALICE Experiment)
- Giovanni Anelli (CERN Knowledge Transfer Group)
- Javier Castillo Castellanos (ALICE Experiment)
- Javier Serrano (CERN Beams Department)
- Jose Benito Gonzalez Lopez (CERN IT)
- Kamran Naim (CERN Scientific Information Service)
- Lukas Heinrich (ATLAS Experiment)
- Marumi Kado (ATLAS Experiment)
- Michelangelo Mangano (Theory Department)
- Myriam Ayass (CERN Knowledge Transfer Group)
- Pere Mato Vila (SFT Group in the Experimental Physics Department)
- Philip Elson (CERN Beams Department)
- Sascha Schmeling (CERN Education, Communication and Outreach)
- Sebastian Neubert (LHCb Experiment)
- Sünje Dallmeier-Tiessen (CERN Scientific Information Service)
- Tim Smith (CERN IT)
- Zach Marshall (ATLAS Experiment)



# Now: Open Science Implementation Plan

- **What is it? Actionable measures to support the policy's implementation across the organization and in the experiments@CERN**
- **Focus of the Open Science Strategy Working Group (OSWG) in Q3/4 2022**
- **Each chapter with 1-3 editors/shepherds of the OSWG, but everyone can contribute to the development of each part**
- **Challenges:**
  - Domains vary in their maturity and adoption. Different measures needed from grassroot activities to fully operational services
  - New roles, responsibilities - sometimes misunderstandings and conflicts
  - Challenging funding and sustainability situations
  - How to scale and coordinate the measures over the course of the next two years?

# Current state of the implementation plan

- **Open Science Working Group is finalizing a revised version**
  - Following the different maturity of the domains, also the granularity of measures varies significantly
  - Significant cross-domain activity: training, education and outreach
  - Linked discussion: Development of an Open Source Programme Office
- **How did we get here?**
  - First version completed by mid November
  - Sent for review by Pippa Wells (deputy Director Research and Computing)
  - Review and revision were discussed in the working group meeting on Dec 6th
- **Roadmap ahead is ambitious and requires coordination and (new) collaboration on almost all topics of the policy**



# An example from the implementation plan

# Example: Implementing Research Integrity etc.

## 5. Research integrity, reuse and reproducibility

CERN is committed to ensuring the integrity of research. In order to facilitate the reuse of its research products, CERN provides infrastructures to accommodate the scale and complexity of its research outputs. Reuse and reproducibility are facilitated by practising comprehensive analysis preservation to capture relevant research objects, such as research data releases with supporting metadata, auxiliary data, linked software, reproducible analysis workflows, documentation, etc.

<https://cds.cern.ch/record/2835057/files/CERN-OPEN-2022-013.pdf>

# Example: Implementing Research Integrity etc.

## DRAFT!

### One of the measures from the implementation plan:

Development of analysis preservation templates within and possibly across experiments/collaborations to capture and test analysis research objects within the next two years (e.g. Gitlab templates for software compilation and testing, CERN Analysis Preservation templates, software container creation templates)

- Sub-Task: A forum for this discussion needs to be identified. The HSF [Data Analysis Working Group](#) currently provides a natural forum for discussion of analysis preservation templates across collaborations. In addition, experimental and theoretical physicists outside the collaborations should be involved, e.g. through the reinterpretation forum and open data workshops, to ensure that external reuse is actually possible.



# Example: Implementing Research Integrity etc.

## DRAFT!

### One of the measures from the implementation plan:

- Facilitated discussion with experiments on needs and priorities concerning analysis preservation services.
- Recommendation and implementation of required tools and services, developed in close collaboration with the experimental collaborations to make sure their needs are served (e.g. Analysis Preservation, REANA etc).
- Viable technical solutions are expected to work also outside the CERN network and should - pending the discussions with other communities above - consider the needs of potential users outside the collaboration.

# Conclusion?

**Well, this is the starting point!**

Comments, suggestions, concerns or wishes welcome.

**A first summary:**

- Constructive discussions in the OSWG
- Ambitious goals and measures
- Many more new collaborations necessary to deliver



**Thank you!**