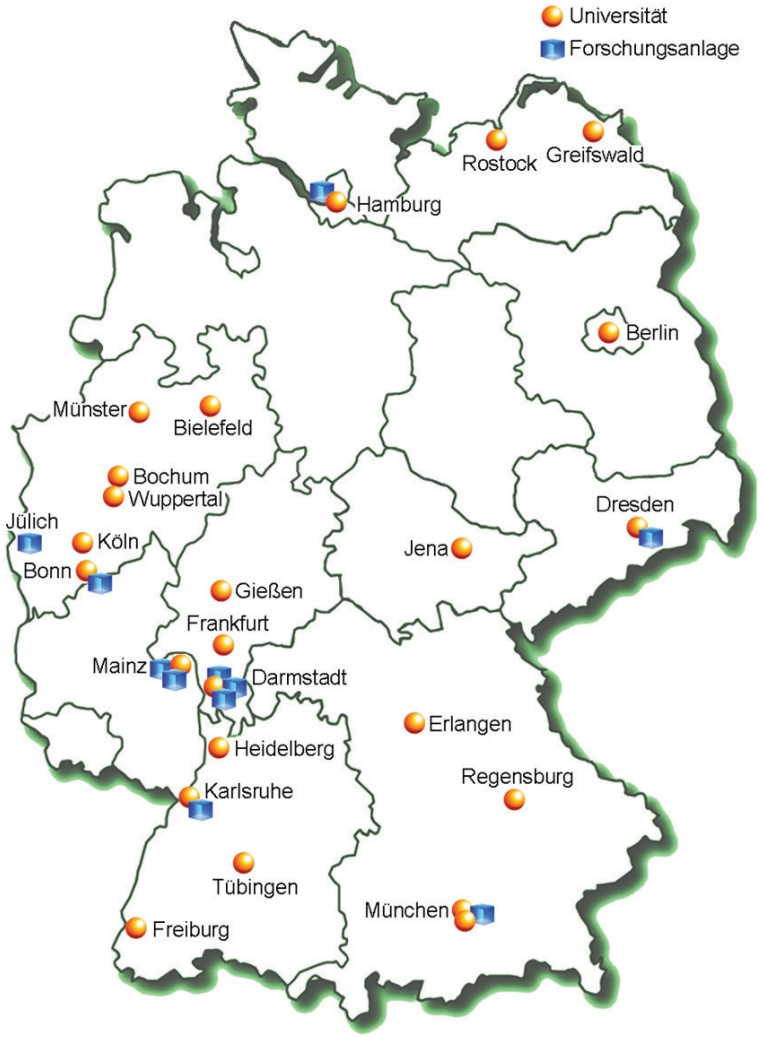
PUNCH4NFDI and KHuK

28.11.2024

Overview

- KHuK represents more than 1100 scientists (incl. PhD students) from 25 German institutes
- Research infrastructures
  - COSY, DESY, ELBE, ELSA, FAIR/GSI, FRM-II, MAMI, S-Dalinac, TRIGA Mark II
- Participation in international large-scale experiments
  - ALICE, COMPASS/AMBER, ISOLDE, BES III, GlueX, CLAS
- Large variety of experiments/collaborations
  - O(10) - O(2000) collaborators



Diverse Community

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Large Experiments
400 – 2000 scientists
ALICE (CERN)
NUSTAR, CBM, PANDA (FAIR)

Huge datasets
Fast processing
MC simulation
Distributed computing

Small - Medium Experiments
O(10) – O(100) scientists
Exp. at ELSA, MAMI, GSI/FAIR, CERN, …

Large datasets
Efficient processing
Common solutions

F.A.I.R.
RDM
Open Access
Publishing
Sustainability

Theory
O(1) – O(10) scientists

Very diverse computing needs
HPC <->Mathematica
Input to experiments
Access to exp. data

Challenges ahead

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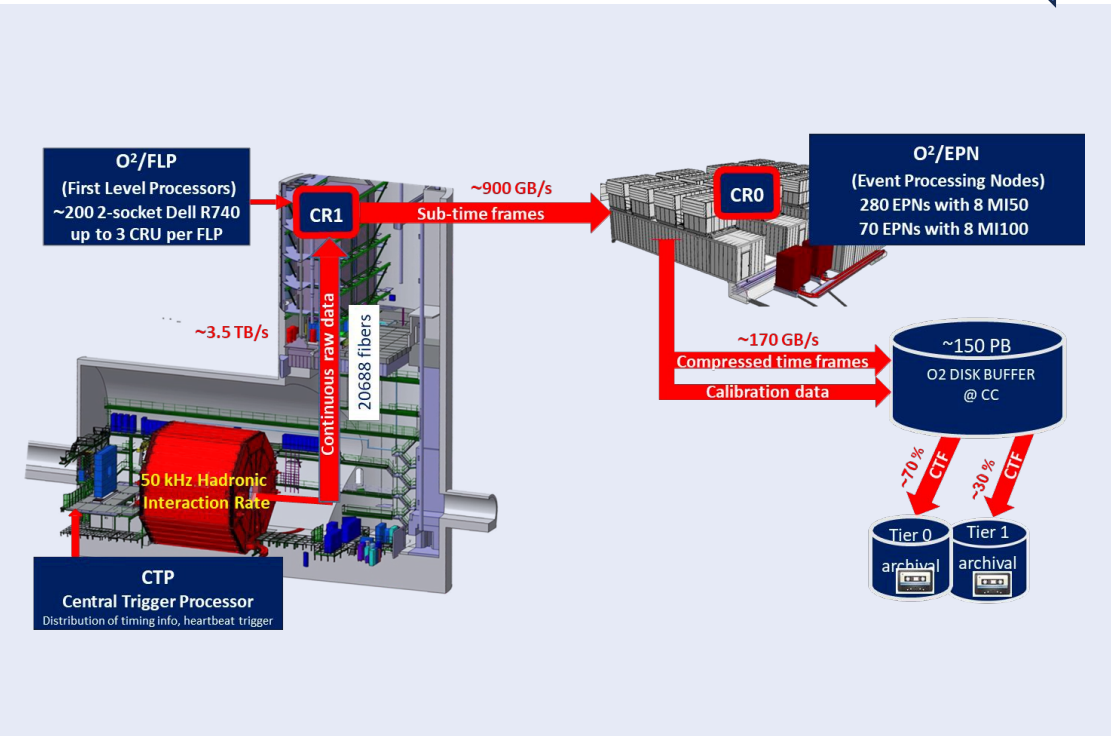
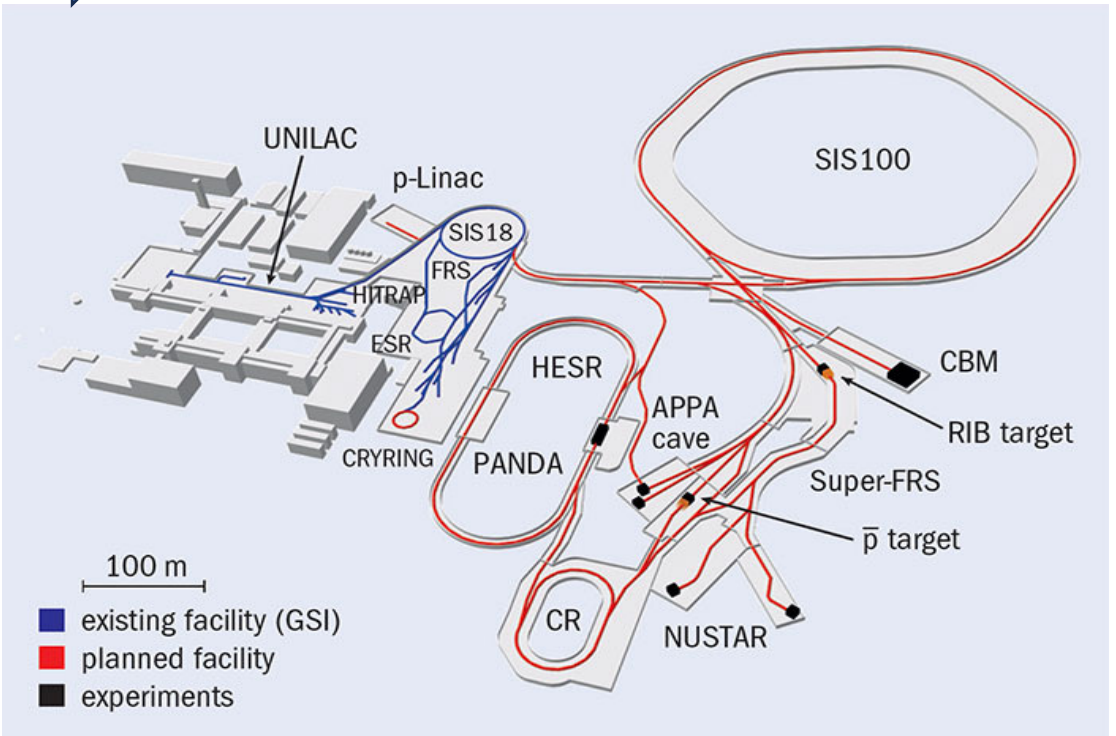
ALICE run 3,4



Strong synergies

Start of FAIR



Computing in a Nutshell

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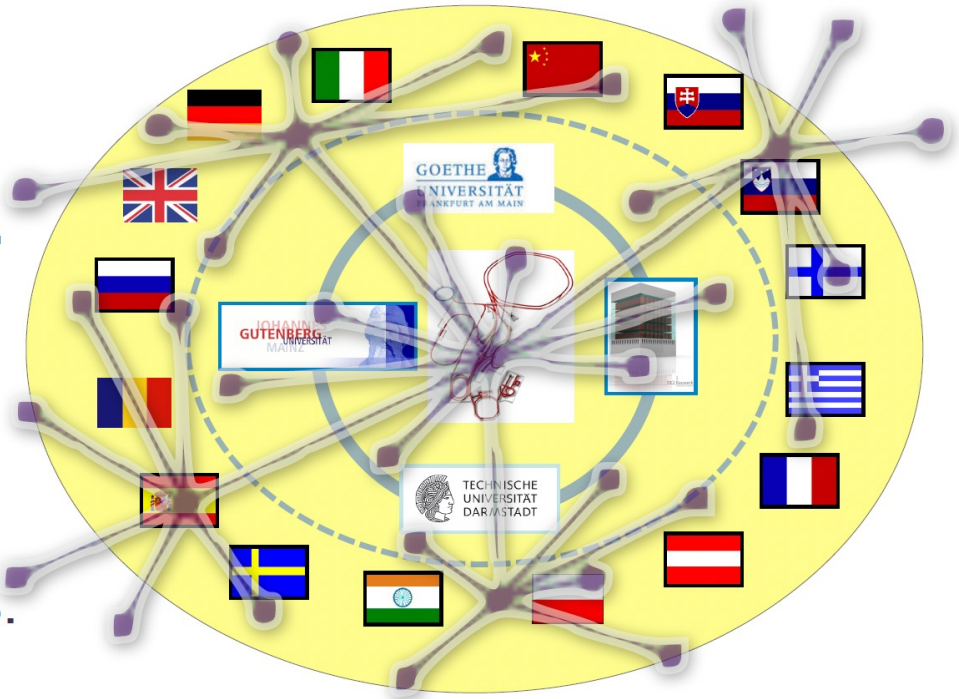
- Towards **federated computing** among large centres.
- Effective **resource sharing** at FAIR TIER-0 account for most of the data-driven computations.
- Federated storage and computing with **local centres** using Teralink network & **commonly used standards.**
- **Containerised approaches** and other **virtualisation** methods for flexible compute operations serving diverse community & optimise usage.
- Data & services access using standard **token-based protocols** (http); AAI using widely accepted standards.
- **Participate** in **domain-specific open-science** inspired activities.



from Johan Messchendorp

KHuK Contributions PUNCH4NFDI

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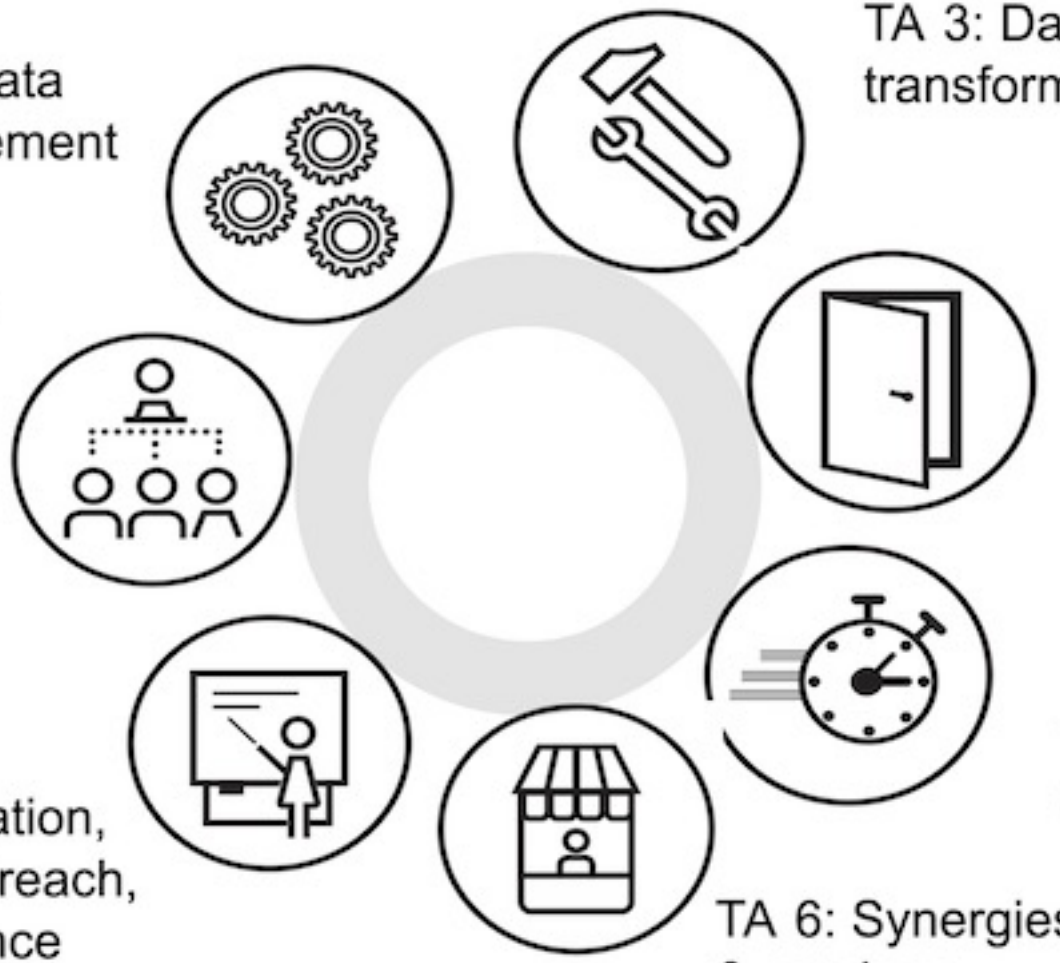

TA 1: Management and governance

TA 2: Data management

TA 3: Data transformations

TA 4: Data portal

TA 5: Data Irreversibility

TA 6: Synergies & services

TA 7: Education, training, outreach, citizen science

Summary

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- PUNCH4NFDI developments important for the computing needs within KHuK
  - Simplified access to distributed compute/storage resources
  - Standardized workflow descriptions
  - New algorithms for fast data generation and analysis
  - F.A.I.R. principles
  - Online processing and selecting of large data sets
  - Education
- Contributions from KHuK in all PUNCH4NFDI Task Areas
- Strong interest for future collaboration in topics important for KHuK
- Wish to PUNCH4NFDI: user friendly solutions
- KHuK: Make PUNCH solutions more visible


Thank you for your attention!

FAIR and F.A.I.R. principles

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Findable

- **Central orchestrated** storage and access of data
- Consistent usage of **Persistent Identifiers** (PID) such as **Digital Object Identifiers** for data and metadata

Accessible

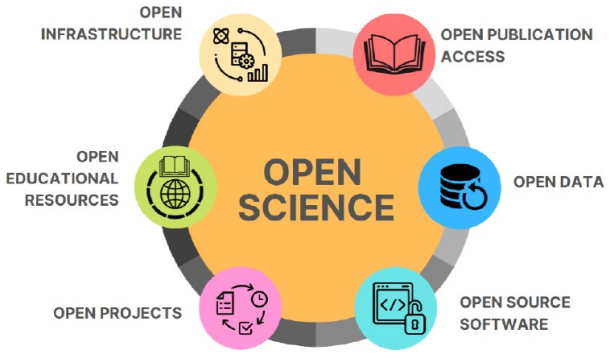
- **Central storage** of data and software for FAIR communities
- Data accessible via **standard http protocols**
- **Token-based AAI**, SSO authentication support
- **Containerised** job execution
- Data and software available under **suitable licenses**

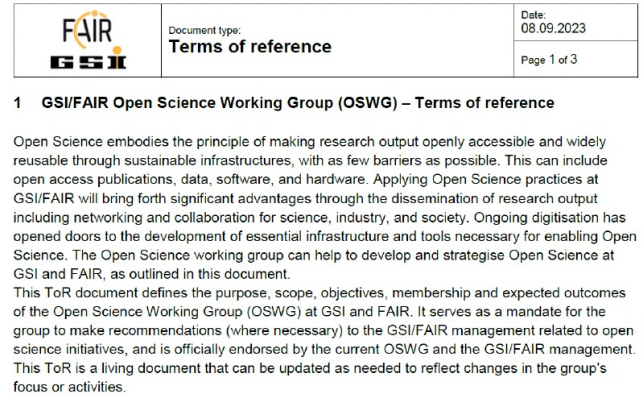
Interoperable

- **Participate** in community-wide **open-science initiatives** on Institutional, National, and European levels
- Follow-up developments in **ESCAPE**, e.g. “Open-source scientific Software and Services Repository (OSSR)“
- AAI in line with domain-driven activities (ESCAPE)
- **Agree** upon controlled **metadata vocabularies** within research domain

Reusable

- **Follows naturally** from a successful implementation of “F”, “A”, “I”





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1 GSI/FAIR Open Science Working Group (OSWG) – Terms of reference

Open Science embodies the principle of making research output openly accessible and widely reusable through sustainable infrastructures, with as few barriers as possible. This can include open access publications, data, software, and hardware. Applying Open Science practices at GSI/FAIR will bring forth significant advantages through the dissemination of research output including networking and collaboration for science, industry, and society. Ongoing digitisation has opened doors to the development of essential infrastructure and tools necessary for enabling Open Science. The Open Science working group can help to develop and strategise Open Science at GSI and FAIR, as outlined in this document.
This ToR document defines the purpose, scope, objectives, membership and expected outcomes of the Open Science Working Group (OSWG) at GSI and FAIR. It serves as a mandate for the group to make recommendations (where necessary) to the GSI/FAIR management related to open science initiatives, and is officially endorsed by the current OSWG and the GSI/FAIR management. This ToR is a living document that can be updated as needed to reflect changes in the group's focus or activities.