

TA6 Synergies & Services

Purpose: Exploitation and promotion of synergies

Reinventing wheels is not smart

Almost any problem you face has been addressed before

We are educated to promote our works in our communities

- when it comes to data management, this is short-sighted.

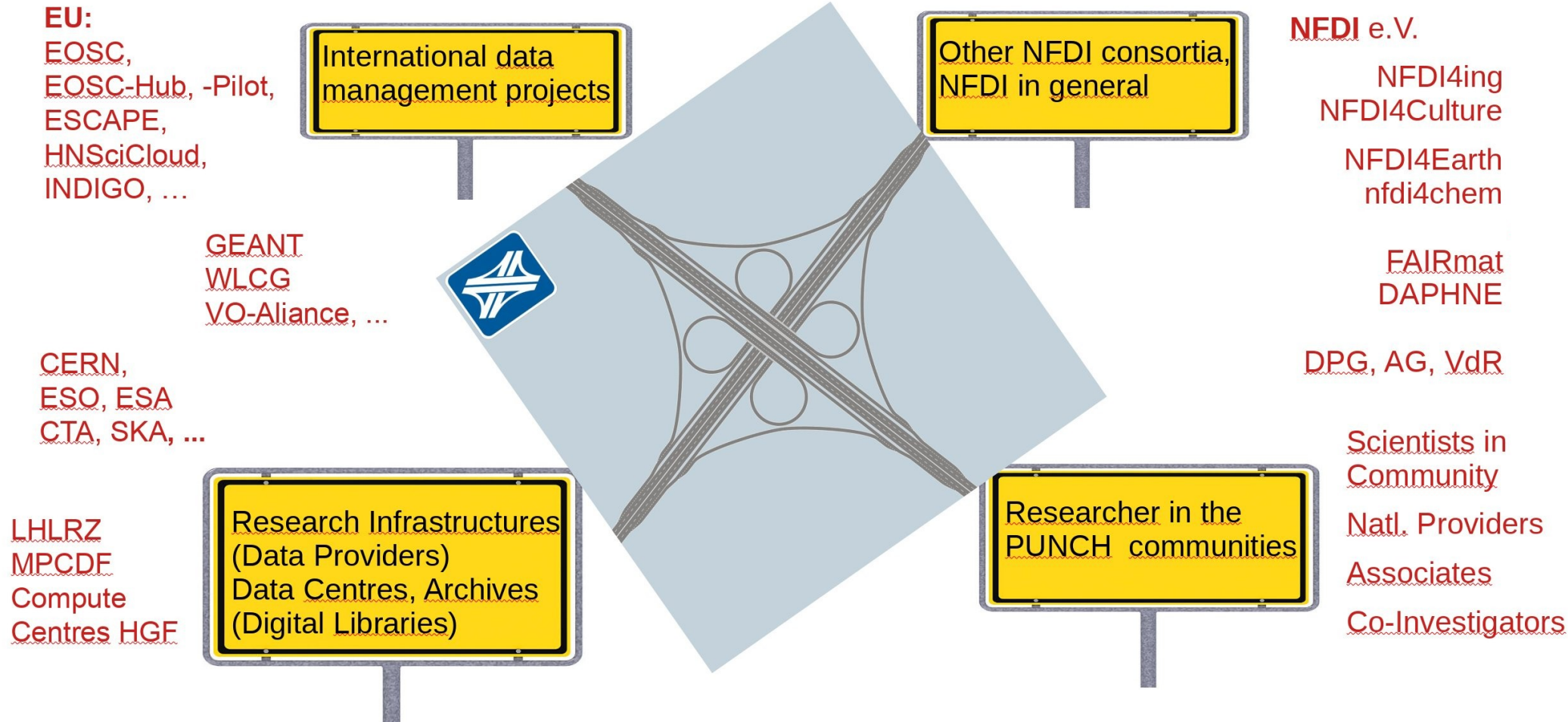
Means: WP 1 Marketplace: Seek and offer solutions

Facilitate contacts, exchange, cooperation, information flow

WPs 2-4: Cross-cutting topics (examples) – AAI, FAIRnes, access

WP 5: Services in big data management

TA6 prepares for an efficient exchange of data management -solutions, -methods, -services, -protocols, -standards



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EU:

EOSC,
EOSC-Hub, -Pilot,
ESCAPE,
HNSciCloud,
INDIGO, ...



International data
management projects

GEANT
WLCG
VO-Aliance, ...

CERN,
ESO, ESA
CTA, SKA, ...

LHLRZ
MPCDF
Compute
Centres HGF



Research Infrastructures
(Data Providers)
Data Centres, Archives
(Digital Libraries)



2022



Other NFDI consortia,
NFDI in general

NFDI e.V.

NFDI4ing
NFDI4Culture
NFDI4Earth
nfdi4chem

FAIRmat
DAPHNE

DPG, AG, VdR

Scientists in
Community

Natl. Providers

Associates

Co-Investigators



Researcher in the
PUNCH communities

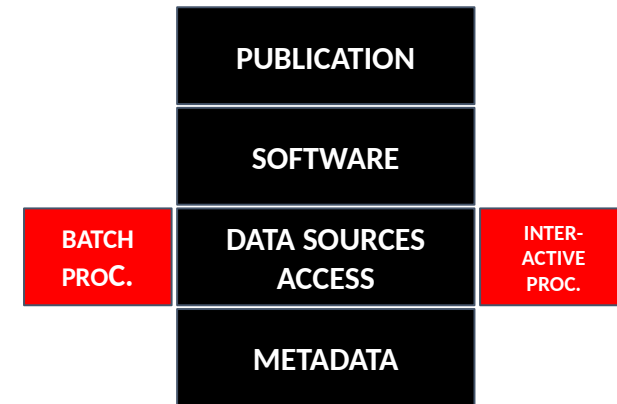
PUNCH4NFDI & NFDI4Culture

Roadmap toward dynamic research products



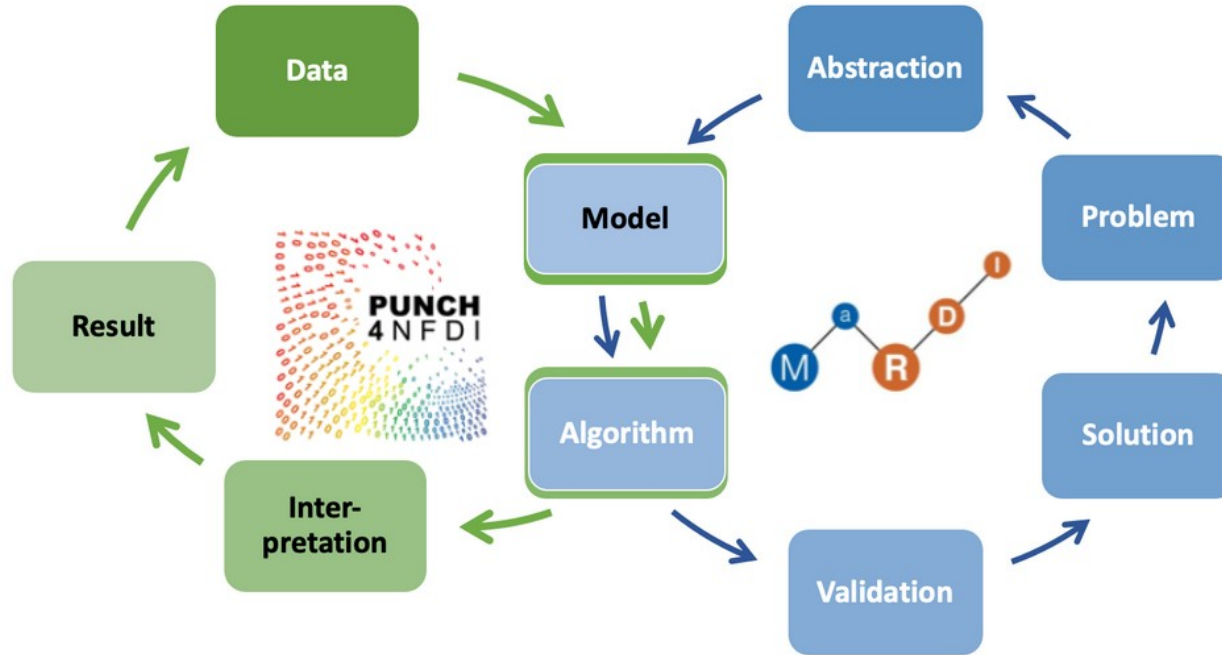
nationale
Forschungsdaten
Infrastruktur
for CULTURE

- Official kickoff workshop on April 21, 2021
 - Target: community overarching description of dynamic research products
 - Each community presented use cases
 - Agreement on a birds eye description of dynamic research products
 - In a follow up workshop a technical implementation shall be investigated
- Further areas of collaboration
 - Legal aspects, education & training, NFDI4Culture applications on PUNCH4NFDI SDP



MaRDI

Example: PUNCH4NFDI and MaRDI



1. Exploring viable analysis methods & statistical procedures (esp. beyond Gaussian errors)

MaRDI: expert service for training, algorithms and validated computational workflows

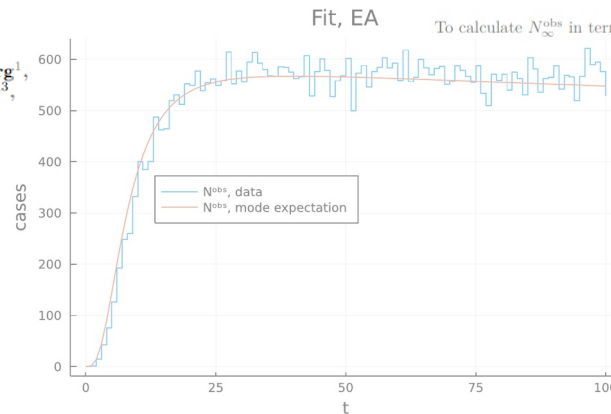
PUNCH4NFDI: high-statistics data sets for extensive testing and further methodologic development

PUNCH4NFDI & Epidemiology

- PUNCH statistics software (BAT.jl and Geneva) are being applied to established epidemiology studies (V. Priesemann et al.)
- In close collaboration epidemiological models are further developed
- PUNCH expertise to be applied for data management solutions

THE CHALLENGES OF CONTAINING SARS-CoV-2 VIA TEST-TRACE-AND-ISOLATE

Sebastian Contreras^{1, 2, X}, Jonas Dehning^{1, X}, Matthias Loidolt^{1, X}, Johannes Zierenberg¹,
F. Paul Spitzner¹, Jorge H. Urrea-Quintero¹, Sebastian B. Mohr¹, Michael Wilczek^{1,3*},
Michael Wibral⁴, and Viola Priesemann^{1,3*}



$$T_{\infty} = \frac{\lambda_s (1 + \eta R_t^H)}{\Gamma (1 - \nu R_t^H)} H_{\infty}^s \quad (3)$$

$$H_{\infty}^s = H_{\infty}^s \frac{\lambda_s}{\Gamma} \left(\frac{\Gamma + \xi^{sp}}{1 - \xi^{sp}} \right) \quad (4)$$

$$H_{\infty}^s = \frac{\Phi}{\lambda_s (1 + \eta R_t^H)} \left[\left(\frac{\epsilon R_t^H}{\nu R_t^H - 1} + R_t^H \right) - (R_t^H - 1) \frac{\eta R_t^H + \frac{1 + \Gamma / \lambda_s}{1 - \xi^{sp}}}{\eta R_t^H + 1} \right]^{-1} \quad (5)$$

$$N_{\infty}^{\text{obs}} = \Gamma \nu R_t^H T_{\infty} + \lambda_s H_{\infty}^s (1 + \eta R_t^H). \quad (6)$$

$$N_{\infty}^{\text{obs}} = \lambda_s H_{\infty}^s (1 + \eta R_t^H) \left(\frac{1}{1 - \nu R_t^H} - 1 \right), \quad (7)$$

$$= \lambda_s H_{\infty}^s \frac{1 + \eta R_t^H}{1 - \nu R_t^H}. \quad (8)$$

Communication, joint (virtual) workshops & PUNCH Lunches

PUNCH4NFDI Open Data Workshop

Thursday 11 Feb 2021, 14:15 → 17:45 Europe/Berlin

Matthias Steinmetz (Leibniz Institute for Astrophysics Potsdam), Thomas Schoerner-Sadenius (DESY)

Description PUNCH4NFDI aims at developing concepts and tools for the efficient management of digital research products in basic physics research. At the heart of the research products are scientific data sets that we want to make available to a broad public for a sustainable usage ("open data").

The first PUNCH4NFDI "open data workshop" will give the opportunity for a first survey of existing and planned open data initiatives within the PUNCH science field. It will address conceptual differences and commonalities between different approaches, inform the PUNCH community about existing open data sets, and enquire about the community's requirements for a better use of open data.

The workshop results will serve as a basis and starting point for PUNCH4NFDI open data activities. Since the workshop is openly accessible, the presentations will be kept in a style understandable to a broad scientific audience.

ZOOM connection:

[Direkt link](#)

Meeting ID: 996 9288 7645

NOTE: The access code previously displayed here has been changed and will be distributed via mail to all registered participants in the morning of the event!

One tap mobile

+16699009128,,99692887645# US (San Jose)

+12532158782,,99692887645# US (Tacoma)

Note: Only registered participants will receive the ZOOM access code.

Registration

Participants

108

[Register](#)

14:15	→ 14:20	Welcome and introduction	🕒 5m
Speaker: Thomas Schoerner-Sadenius (DESY)			
20210211.OpenDat...			
14:20	→ 14:35	The NFDI and open data	🕒 15m
Speaker: Hendrik Seitz-Moskaliuk (NFDI)			
2021-02-11-OpenDa...			
14:35	→ 14:50	CERN Open Data, and HEP experiments in general	🕒 15m
Speaker: Achim Geiser (CMS (CMS Fachgruppe QCD))			
HEPOpendata2021...			
14:50	→ 15:05	Astronomy and ESO open data approaches	🕒 15m
Speaker: Michael Sterzik (ESO)			

PUNCH-Lunch: an online jour fixe around PUNCH4NFDI topics biweekly Thursdays 12:30-13:30

22 Apr 2021: Quo vadis, PUNCHLunch seminar?

[\(PDF\)](#)

08 Apr 2021: PUNCH4NFDI and ESCAPE - Analysis Platforms in the PUNCH sciences [\(PDF\)](#)

25 Mar 2021: Data irreversibility in the PUNCH world

[\(PDF\)](#)

11 Mar 2021: PUNCH4NFDI and machine learning for fundamental science [\(PDF\)](#)

25 Feb 2021: PUNCH Curriculum Workshop [\(PDF\)](#)

11 Feb 2021: PUNCH4NFDI and ESCAPE - towards data lakes [\(PDF\)](#)

28 Jan 2021: PUNCH4NFDI and NFDI4Culture - natural sciences and humanities in the NFDI [\(PDF\)](#)

14 Jan 2021: The PUNCH science data platform

[\(PDF\)](#) [\(PDF of Slides\)](#)

3 Dec 2020 Topic: PUNCH4NFDI and ESCAPE

[\(PDF\)](#)

19 Nov 2020 Topic: Intro to PUNCH4NFDI and the

NFDI [\(PDF\)](#)

TA6 Synergies & Services

WP 6.1: Marketplace

- Interfaces to NFDI-consortia

- TA (community) - overarching use-cases

WP 6.2: Authentication and authorisation infrastructure

WP 6.3: FAIRnes

- Metadata extensions for cross-disciplinary data-reuse

- Open Data: making data publicly accessible

- Publishing data and links to archives/libraries/publishers

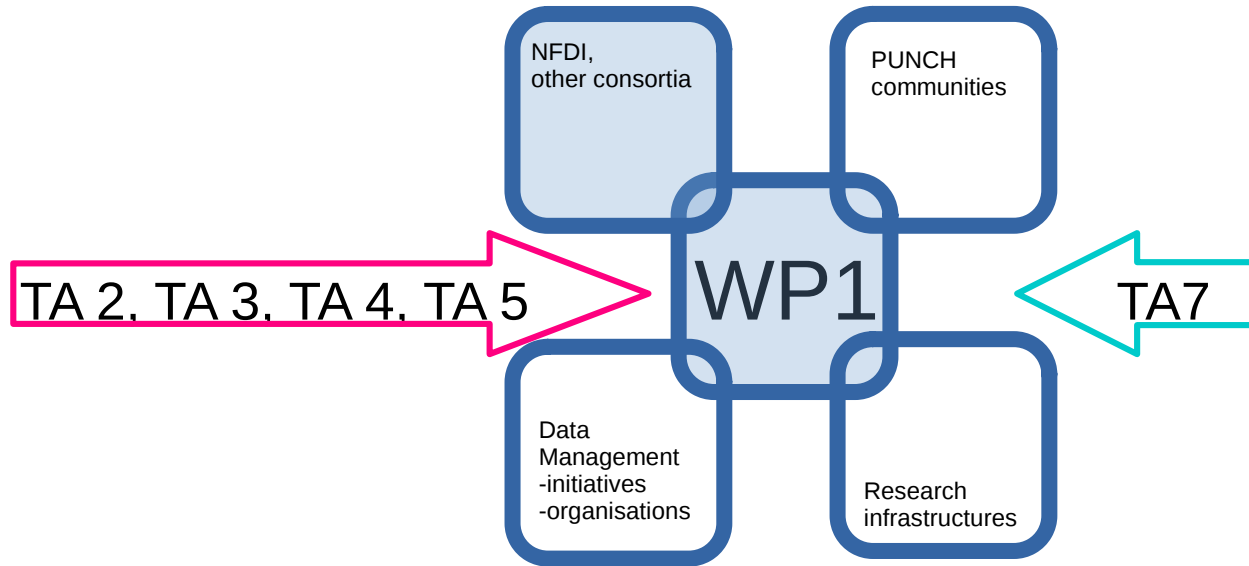
WP 6.4: Open Source data analysis tools

WP 6.5: Services in big data management

- Large-scale distributed computing & storage

- Multi-archival cross matches

TA6 WP1



Exchange of

- Contacts
- Activities
- Solutions
- Services

Joint work, e.g.

NFDI4ING

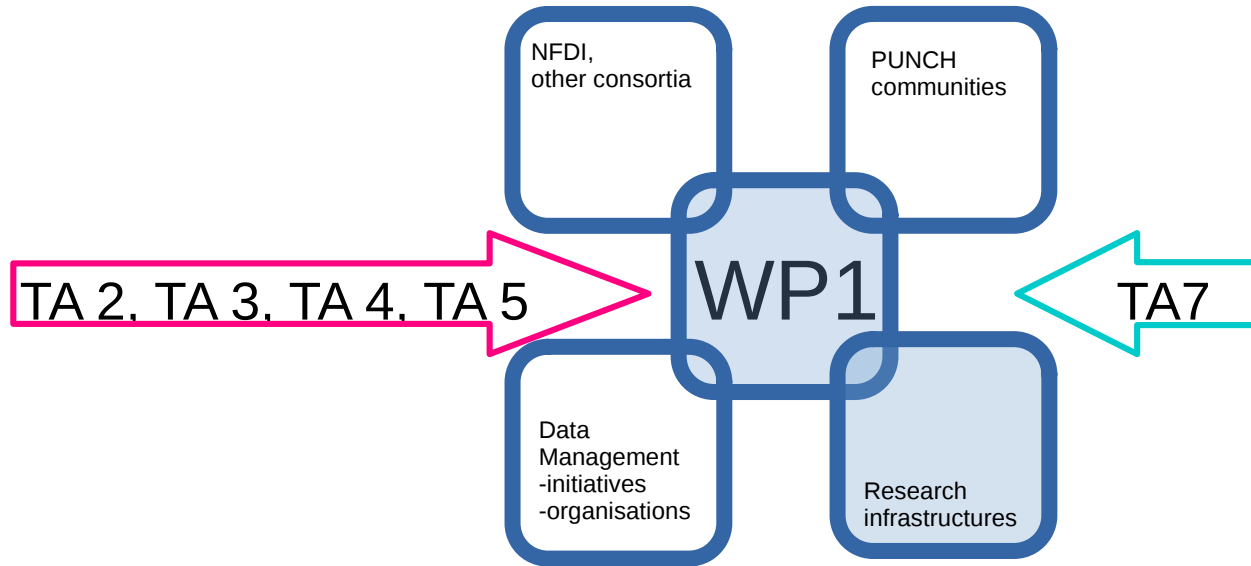
- **tor on DRP**
- **AAI**
- **services**
- citizen science

NFDI4Culture

- ...

Contact: Kilian Schwarz (GSI)
Stefan Wagner (U. Heidelberg)

TA6 WP1



Exchange of concepts on

- data archiving
- open access
- services
- analysis tools

ESO
CERN
ESA
SKA

(FAIR,
CTA)

TA6 - WP2:

transparent access to resources needs a common AAI

State of the Art:

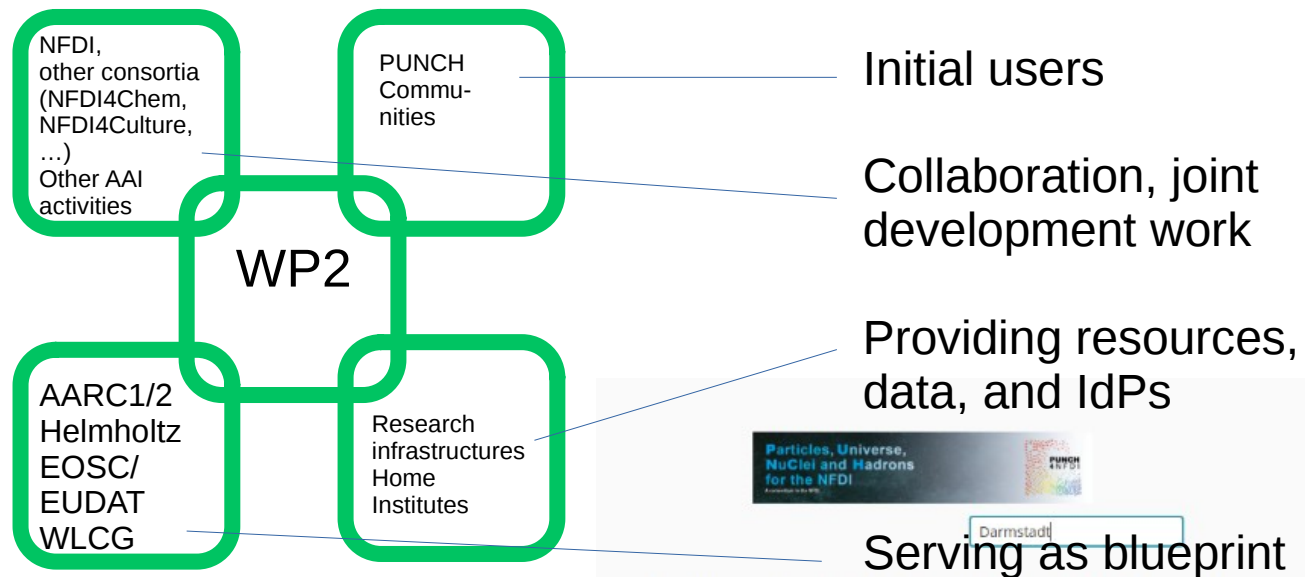
X509 certificates in WLCG

Measures:

Build PUNCH4NFDI AAI with Helmholtz AAI and EOSC/EUDAT B2ACCESS serving as blueprint. Software base: Unity, IdPs should offer Oauth and SAML endpoints

Goals:

Contribute to one NFDI-wide AAI solution



browse to <https://login.helmholtz.de/punch>

Contact: Kilian Schwarz (GSI)
Daniel Mallmann (FZJ)

TA6 – WP3

Cross-community efforts towards FAIR data

State of the Art

... → see application

Measures

... → see application

Goals

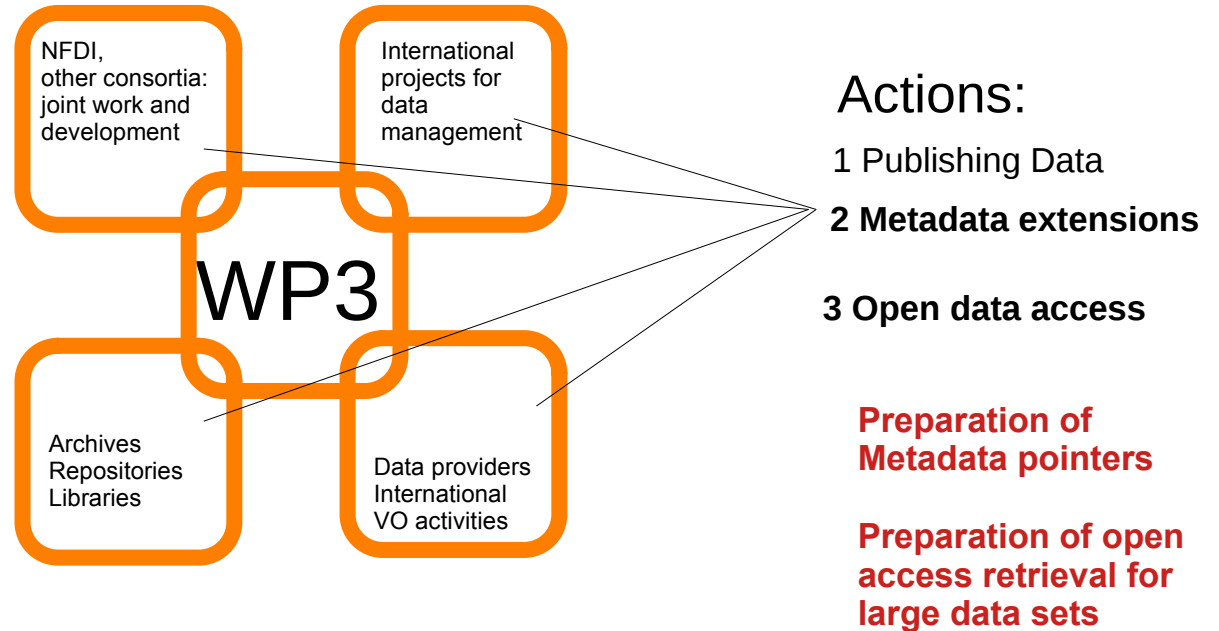
... → see application

**Support for making data accessible
(workflows, curation, documentation)**

**Marker/pointer systems for
extensive metadata extensions**

... → see application

Contact: [Hermann Hessling \(HTW\)](#)
[Stefan Wagner \(U. Heidelberg\)](#)



TA6 – WP4 Open Source Tools

State of the Art

... → see application

Measures

... → see application

Goals

... → see application

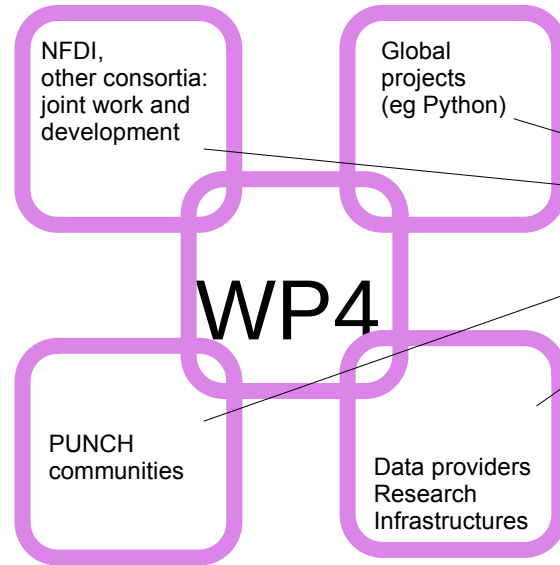
**Support for making tools public
(workflows, documentation)**

**Inter-connectivity, dependencies
Long-term maintenance**

... → see application

Contact: [Guenther Duckeck \(LMU\)](#)

[Jim Hinton \(MPIK\)](#)



Actions:

1 Survey of use-cases

2 Example repository

3 Example solutions

4 Guidelines and documented examples

5 Platform with tools and frameworks

TA6 – WP5 Services in Big Data Management

State of the Art

... → see application

Measures

... → see application

Goals

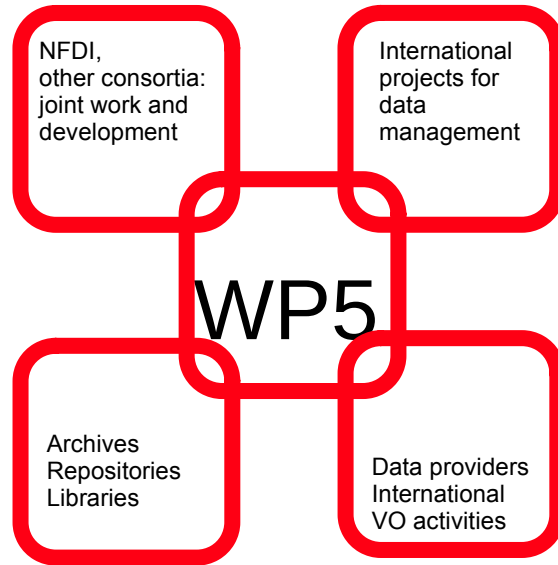
... → see application

Services developed in TA 2-5

to be offered beyond teams via TA6

Funding cuts: roll-out schemes on Best-effort basis

Contact: Matthias Steinmetz (AIP)
Arnulf Quadt (GAU)



Actions:

access to open data archives such as the open data of CERN's LHC experiments and the IVOA.

Dynamic Disk cache for including opportunistic storage resources.

Interfaces to and integration of already existing infrastructures and services in community-specific applications such as for example the supercomputer "HLRN – High Performance Computing in northern Germany".

Parts of various decentralized community specific resources will be jointly managed via the COBaD/TARDIS compute resource management software framework and provided to PUNCH and beyond for analysis of community specific data as well as for CERN open data to the general public.

Multi Cloud resources as compute and storage testbed, e.g. for interactive analysis.

Interactive data analysis and data visualization. Standard analysis software with the JupyterHub platform.

Cloud based environment for PUNCH microservices

Implementation and operation of a metadata catalog architecture with user interface and prototype implementation for lattice QCD (LQCD), development of metadata standards for astrophysical simulations and automated simulation data publication

Rucio and FTS evaluation

PUNCH4NFDI/TA6

MaRDI: micro-metadata schemes,
statistical procedures, use cases

NFDI4CS: easier access to
and use of HPC centres

NFDI4Ing: archetypes,
terminology services, work on
basic services, AAI, ...

NFDI4Microbiota: use cases,
AAI and cloud standards

NFDI4Culture: legal aspects
of AAI and FAIR data
management

NFDI4Chem: common work on
AAI, metadata & data reusability

DAHPNE4NFDI & FAIRMat &
DPG: jointly address
physics-related aspects



Marketplace, PUNCH-SDP,
data portal

Knowledge fabric, digital
research products, metadata
services

AAI infrastructure,
dynamic disk caching

Big data management &
data storage services

Machine learning services
and real-time applications

IT resources via Compute4PUNCH
interactive analysis interface

Cloud-based testbed

Teaching and education

210921 Interaction TA6 with other TAs

- TA3
 - Taking: list of data science tools, code examples for further development, algorithms as service candidates
 - Giving: inventory of data science tools, collaborative software tools, advertisement via market place, transfer of developments into services
- TA4
 - Collaboration in AAI, metadata, flexible data formats, reference guides for publication of data and software
- TA5
 - Taking: memory based computing, fast algorithms, scaling for parallel computing, dynamic metadata schemata
 - Giving: advertising via market place, finding collaboration partners, collaboration in dynamic metadata