

Status and prospects of the PUNCH4NFDI Consortium

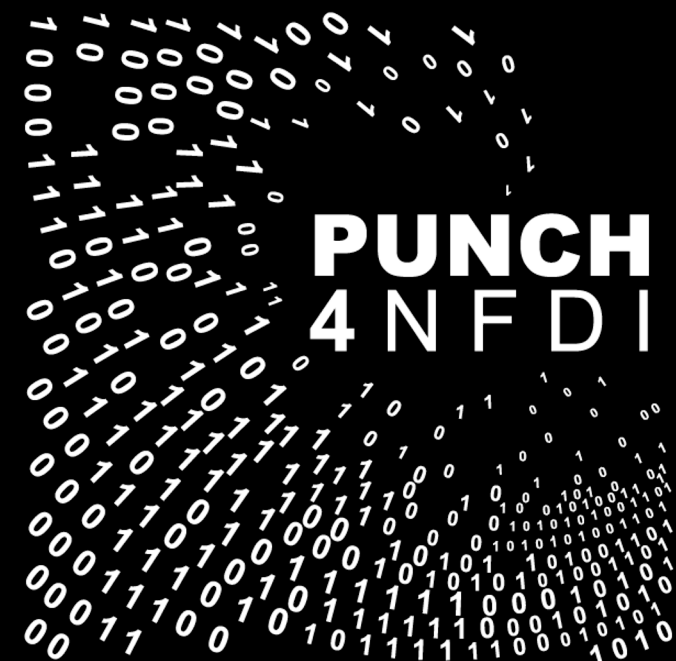
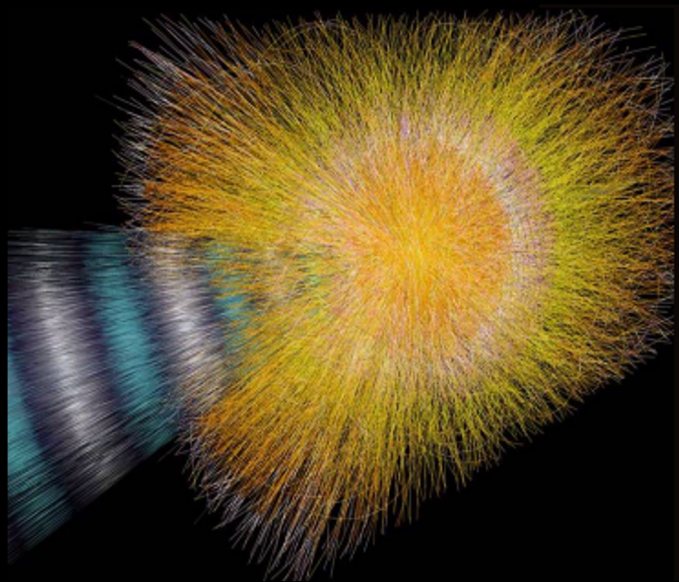
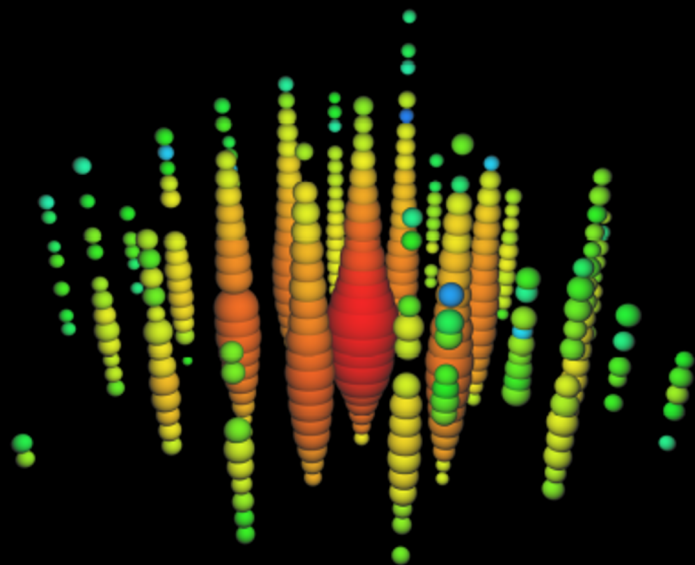
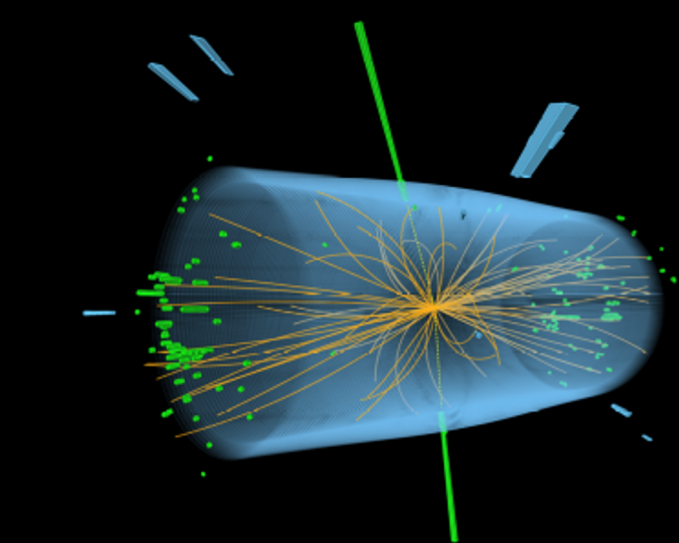
Particles, Universe, NuClei and Hadrons for the NFDI

Matthias Steinmetz

EScience and Virtual Observatory Splinter – Annual Meeting of the German Astronomical Society

16 September 2021





**Particles, Universe, NuClei
and Hadrons for the NFDI**

die Gemeinsame Wissenschaftskonferenz (GWK) hat in ihrer Sitzung am 02. Juli 2021 die Einrichtung und Finanzierung des Konsortiums

NFDI 39/1 "PUNCH4NFDI - Teilchen, Universum, Kerne und Hadronen für die NFDI"

zum 01. Oktober 2021 beschlossen.

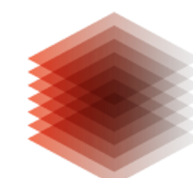
Funded 2020:

- DataPlant
- GHGA
- KonsortSWD
- NFDI4Biodiversity
- NFDI4Cat
- NFDI4Chem
- NFDI4Culture
- NFDI4Health
- NFDI4Ing

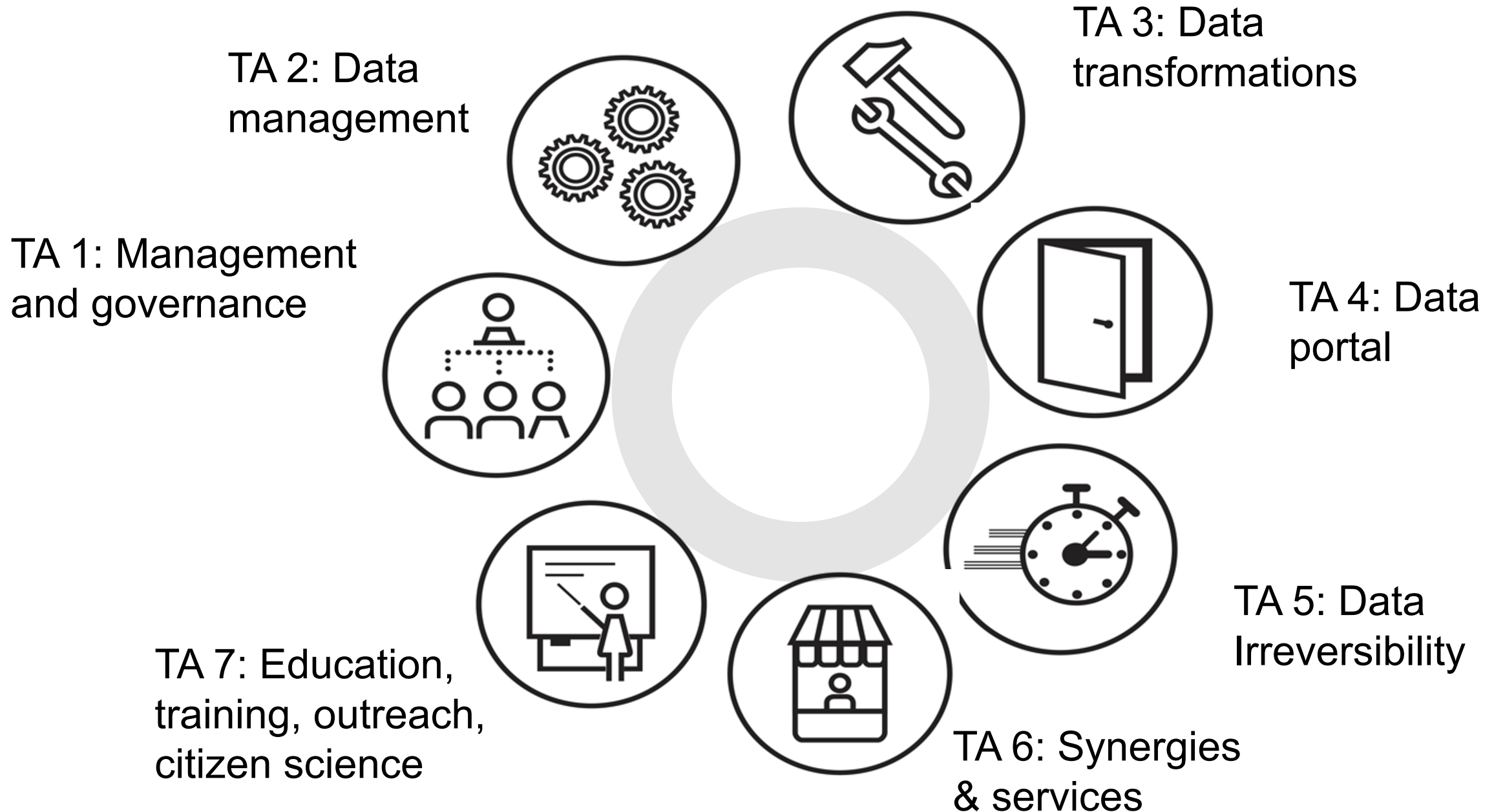
Funded 2021:

- **PUNCH4NFDI**
- **DAPHNE4NFDI**
- **FAIRMAT**
- MatWerk
- NFDI4DataScience
- MaRDI
- NFDI4Earth
- NFDI4Microbiota
- Text+
- BERD@NFDI

Who We Are



Task Areas



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 metadata & data resusabiliy

DAPHNE4NFDI & FAIRMat & DPG: address physics-specific aspects



TA 6 Marketplace



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

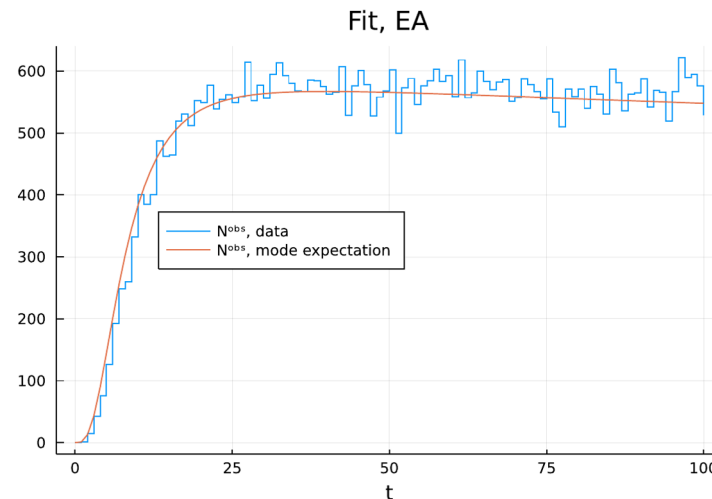
(Non-exclusive examples)

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 is planned to be applied for corresponding 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 Wibral¹, and Viola Priesemann^{1,3*}



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

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

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

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

te N_{∞}^{obs} in terms of the model's parameters, we insert equations (3)–(5) into equation (6):

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

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

Particles, Universe, NuClei and Hadrons for the NFDI

A consortium in the NFDI.

Programme so far:

- 19 November: PUNCH4NFDI
- 3 December: PUNCH4NFDI and ESCAPE
- 14 January: the PUNCH Science Data Platform
- 28 January: PUNCH4NFDI and NFDI4Culture

...

20 May: Epidemiology

...

16. September: Dynamic federation of heterogeneous resources in high-energy physics and beyond

All events: <https://indico.desy.de/category/743/>

Information: send mail to sympa@desy.de with subject line “subscribe punch4nfdi-punchlunch”



PUNCHLunch –
the online lunch seminar of the **PUNCH4NFDI Consortium**
Every second Thursday, 12:30-13:30 hrs: keynote and discussion

Thursday, 8 April 2021, 12:30 hrs:
John Swinbank (ASTRON) and Harry Enke (AIP)
“**Analysis Platforms in the PUNCH sciences**”
Continuing the **PUNCH4NFDI-ESCAPE** dialogue

Abstract:
This seminar is the third part of a more intense dialogue between PUNCH4NFDI and the German ESCAPE participants, with the aim of coordinating both efforts. ESCAPE (European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures) aims at establishing a single collaborative cluster of next-generation “European Strategy Forum on Research Infrastructures” (ESFRI) facilities in the area of astronomy and accelerator-based particle physics. It aims for implementing a functional link between the concerned ESFRI projects and the European Open Science Cloud (EOSC). German contributions to ESCAPE focus, among other things, on data lakes, interactive analysis interfaces, and software distribution. A further topic is the Virtual Observatory integration, in particular for data from EST and CTA. In these and other fields, there are numerous contacts between PUNCH4NFDI and ESCAPE.

This time, we want to address the goal of integrating different infrastructure components (portal/web interface, collaborative platform, cloud infrastructure and data resources) using examples from ongoing projects for providing the basis of a scientific analysis platform via which sustainable research workflows can be performed.

Connection details:
ZOOM Webinar “PUNCH-Lunch”: <https://desy.zoom.us/j/94927131622>
Webinar ID: 949 2713 1622, **passcode:** 532479

Next event:
Thursday, 22 April 2021, 12:30 hrs – topic to be confirmed.

Connect to PUNCH4NFDI:
Twitter: @PUNCH4NFDI
Mail: punch4nfdi@desy.de
Web: www.punch4nfdi.de

Workshops



Workshop of the PUNCH4NFDI Consortium

Thursday, 11 February 2021, 14:15 – 17:30 hrs:
**PUNCH4NFDI and “open data” in the PUNCH sciences –
– towards the implementation of PUNCH4NFDI plans**

Abstract:

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.

INDICO agenda and registration

(Note: only registered participants will receive the ZOOM password):
<https://indico.desy.de/event/28448/>

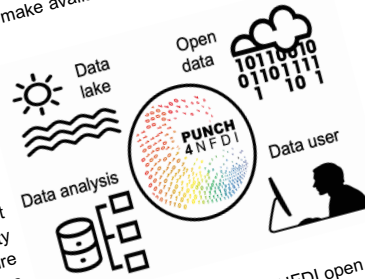
Connection details:

ZOOM Meeting ID: 996 9288 7645; <https://desy.zoom.us/j/99692887645>

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Web: www.punch4nfdi.de



.... and ...

- PUNCH4NFDI open data workshop
- Workshop with NFDI4Culture on digital research products
- Contribution to DPG annual spring meeting
- Participation in Helmholtz open science meeting
- Contribution to workshop on data management plans
- Contacts to jPDG about education and curricula aspects
- ...

Open Science / Open Data Activity

PUNCH4NFDI “Open Data” Workshop

2:15 PM → 2:20 PM	Welcome and introduction Speaker: Thomas Schoerner-Sadenius (DESY)  20210211.OpenDat...	🕒 5m 
2:20 PM → 2:35 PM	The NFDI and open data Speaker: Hendrik Seitz-Moskaliuk (NFDI)  2021-02-11-OpenD...	
2:35 PM → 2:50 PM	CERN Open Data, and HEP experiments in general Speaker: Achim Geiser (CMS (CMS Fachgruppe QCD))  HEPOpendata2021...	
2:50 PM → 3:05 PM	Astronomy and ESO open data approaches Speaker: Michael Sterzik (ESO)  Sterzik.ESOasOpen...	
3:05 PM → 3:20 PM	Virtual Observatory ⓘ Speaker: Markus Demleitner (Universität Heidelberg)  pop.pdf  twoup.pdf	
3:20 PM → 3:35 PM	KCDC Speaker: Andreas Haungs (Karlsruhe Institute of Technology - KIT)  PUNCH_OpenData...	
3:50 PM → 4:05 PM	Data and analysis reinterpretation Speaker: Lukas Heinrich (CERN)  PUNCH4NFDI.pdf	🕒 15m 
4:05 PM → 4:20 PM	Smaller hadron&nuclear experiments / communities Speaker: Dr Stefan Typel (TU Darmstadt)  shnc.pdf	🕒 15m 
4:20 PM → 4:35 PM	The astroparticle / HE community Speaker: Gernot Maier (DESY)  NFDI-20210211-As...	🕒 15m 
4:35 PM → 4:50 PM	The International Lattice Data Grid Speakers: Carsten Urbach (University of Bonn), Hubert Simma (NIC / DESY)  ildg.pdf	🕒 15m 
4:50 PM → 5:05 PM	LOFAR (and MEERKAT, SKA) Speakers: Dominik Schwarz (U Bielefeld), Michael Kramer (Max-Planck-Institut fuer Radioastronomie)  Schwarz.PUNCHOp...	🕒 15m 
5:05 PM → 5:30 PM	PUNCH4NFDI open data plans, and discussion	🕒 25m 

PUNCH4NFDI User Committee

- Anna Frankowiak (Bochum) KAT
- Uli Katz (Erlangen)
- Guenter Dueckeck (LMU) KET
- Thomas Kress (Aachen)
- Hannah Elfner (Frankfurt) KHuK
- Ralf Averbeck (GSI)
- Caroline Heneka (Hamburg) RdS
- Stefanie Muehle (Bonn)

“PUNCH”Lines

A leader in data management with expertise in big data, open data, FAIRification, use of heterogeneous resources

PUNCH4NFDI – an open consortium by the community for the community - and beyond

Ready to go now!

**PUNCH
4 N F D I**

**An asset for the entire NFDI
But beware – others are doing
clever things too (experience
with NFDI4Culture)**

Experience, expertise & work programme to take data management to the next level and solve the problems that others will have tomorrow

Thank you!

The PUNCH4NFDI Consortium

Spokesperson:

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