

The PUNCH4NFDI Consortium

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1. News and Highlights

1.1 Towards PUNCH-2.0

It started at the PUNCH4NFDI Annual Meeting in November 2024 in Bonn; it continued with – according to INDICO – six day-long (mostly in-person: in Kassel, Hamburg, Frankfurt, Göttingen) meetings between February and June 2025 – and numerous other consultations in-between; and it did not end with the submission deadline on 6 August or the defence at the DFG in Bonn on 13 November: our road towards PUNCH-2.0 and a second five-year funding period for our consortium!

This August, we submitted a beautiful 223-pages long proposal to the DFG, containing quite substantial changes to what we have and live today in the PUNCH4NFDI Consortium of the first funding period: some partners will leave the consortium – others will join us, both as co-applicants and as participants. We will re-arrange our task area structure. And – as a new, and very significant element – we have introduced seven use cases into our portfolio. These use cases are prototypical data management frameworks or analysis workflows that, on the one hand, exercise our infrastructures, tools and services and thus help to finalise, improve and complement them. On the other hand, the use cases – especially if cast into the form of a digital research product (DRP) will serve as examples for future work and as crystallisation nuclei of further DRPs and workflows for specific application fields and scientific domains derived from them.

I experienced one striking difference to the preparation of the original PUNCH4NFDI proposal, back in 2020: While, back then, we hardly knew and barely understood each other – especially between the HEP and the astro crowds – this time we had the opportunity to meet and discuss frequently, and to build on our experience gained in the past almost five years. I am convinced that the proposal shows this difference very clearly!

What comes next? Some interaction with the DFG and their expert committee in January 2026, in March the decision meeting of the DFG expert committee, and in July the final verdict on our second funding period, by the GWK. In the meantime, we will do all we can to further sharpen our work programme for PUNCH-2.0 and to agree on important technical and organisation issues.

And around our consortium? The NFDI will probably be changing drastically, with a new “Bund-Länder-Vereinbarung” between federal government and the states on the future governance and funding of the NFDI. We need to prepare also for this challenge, in order to let others benefit from our developments and, equally important, to profit from future funding and technical / service opportunities in the NFDI framework. Stay tuned!

(by T. Schörner)

1.2 EXPLORE Service: a growing gateway to ATLAS Open Data in 2025

The EXPLORE service, developed and operated within the PUNCH4NFDI consortium at the 2nd Institute for Physics of the University of Göttingen, has seen remarkable growth and scientific engagement throughout 2025. Since its production launch, **more than 190,000 analysis jobs have been executed on ATLAS 13 TeV Open Data**, demonstrating how open and FAIR research infrastructures can enable real high-energy physics analyses for a broad community.

Throughout 2025, **EXPLORE supported learning and research activities across Europe and beyond**. The year began in Sulechów (Poland), where upper-secondary students had the opportunity to use EXPLORE to engage with LHC Open Data during the inauguration of the Student Champions League. At CoRDI 2025 in Aachen, EXPLORE was presented as a scalable and reproducible computing service for LHC Open Data, attracting strong interest from researchers seeking accessible platforms that lower barriers to high-energy physics analysis. Most recently, EXPLORE was used in hands-on sessions at the ATLAS Open Data Tutorial at CERN, where participants from institutions worldwide worked through complete analysis workflows using containerized, FAIR-aligned environments.



Figure 1: Impressions of the event in Poland (top) and at CERN (bottom).

EXPLORE continues to grow as a demonstrator of the FAIR principles within PUNCH4NFDI: providing open access, transparent workflows, and reproducible environments for everyone from high-school learners to early-career researchers to experienced physicists. With new datasets, workflows, and integrations planned for 2026, the service is steadily becoming a central entry point for open and collaborative research in particle physics.

1.3 StarHorse on PUNCH4NFDI Infrastructure: first production run successful

In the last weeks of 2025, the Annual Meeting of the PUNCH4NFDI Consortium took place (19 and 20 November at the AIP, Potsdam), celebrating an important milestone for the project: the successful completion of the first production run of the StarHorse analysis framework on the PUNCH4NFDI federated infrastructure. Presented by Arman Khalatyan (StarHorse team, AIP) and Elena Sacchi (PUNCH4NFDI team, AIP), this achievement demonstrates the operational readiness of the consortium's computing resources and workflow integration systems.

For further information on the achievements, the technical components of the infrastructure and StarHorse, visit the news page of PUNCH4NFDI.

1.4 Physics-LLM: Foundation Models for Research Data Management in Physics

Physics-LLM is one out of three projects currently funded in the ErUM-Data funding line (ErUM – “Erforschung von Universum und Materie”), which specifically address Research Data Management (RDM) in physics. The interdisciplinary consortium is formed by thirteen principal investigators from different ErUM communities and one PI from Computer Science. One associated partner as well as the industry partner Erium complete the consortium.

With a total funding volume of approximately three million Euro, Physics-LLM has set out to develop an LLM-enhanced toolkit for research data management in physics. Within the consortium the work is distributed between overarching and community specific tasks. As the same suggests, community specific work packages will tackle unresolved challenges in research data management for a specific community, e.g. astroparticle physics or the photons and neutrons community. Overarching work packages on the other hand will address challenges relevant for the entire ErUM community, e.g. data collection and model finetuning.

The developed RDM-toolkit is envisioned to span the entire data lifecycle and develop AI-workflows and agentic systems which are guided by the FAIR principles. As the goals of Physics-LLM are rooted in RDM, there is a natural connection to the activities in PUNCH4NFDI and the consortium is looking forward to a fruitful collaboration.

In case you have news that you want to share with PUNCH4NFDI, don't hesitate to send a mail to info@punch4nfdi.de. You can access all newsletters on our [web site](#).

2. NFDI and related topics

After the publication of the report on the structural evaluation on NFDI by the German Council of Science and Humanities (Wissenschaftsrat, WR) in July 2025, the discussion on the future of NFDI has gained traction. After initial statements by the NFDI Consortia Assembly as well as the directorate, several meetings and workshops were conducted to sharpen a common view by NFDI. PUNCH4NFDI is in contact with further physics-related consortia as well as DPG in order to discuss a common view on future perspectives.

Base4NFDI: With Accounting4NFDI, there are now nine basic services funded through this initiative: one in the ramp-up phase, four in the integration phase, and four in the integration phase. A summary of the events and highlights in Base4NFDI in 2025 can be found [here](#). The deadline for proposal submission to the next, the 10th round in Base4NFDI is soon, on 28 January. The deadline for round 11 will be on 22 April.

Save the date: the Base4NFDI User Conference 2026 will take place from 24-25 November at Staatsbibliothek zu Berlin, Haus Potsdamer Straße. Further information will follow.

3. Upcoming events and excitements

- On 23 – 27 February, *Astroinformatics 2026* will take place at the University of Cologne
- The *RDA Germany* (RDAdE) Meeting, hosted at GFZ in Potsdam, takes place on 24 – 25 February.
- The *DPG spring meeting* by the Section Matter and Cosmos (SMuK) takes place on 15 – 20 March in Erlangen. PUNCH4NFDI will again be present with a booth at the exhibition part of the conference.
- On 28 – 30 April, the *HMC Conference* will take place in Heidelberg

4. Recent talks, results, and publications

This is a collection of several publications by PUNCH4NFDI members which can also be found at least partly on the web page, the [results page](#) and in ZENODO (<https://zenodo.org> – just search for “PUNCH4NFDI” or – if you are interested in the broader scope – “NFDI”).

- Integration of a data centre for high-energy astroparticle physics in PUNCH4NFDI infrastructure
- Bertrand's Representation of the Optimal Detector
- Metadata mappings and transformations for the PUNCH4NFDI Science Data Portal