The PUNCH4NFDI Consortium

Newsletter Number 8

April 2024

Contents

1. News and Highlights

The ErUM-Data-Hub organized a **Deep Learning School "Basic Concepts"** dedicated to beginners in the field. The school took place from 26 February to 1 March in Wiehl. Nearly 30 students, doctoral candidates and postdocs gathered to follow the lectures given by an outstanding team of speakers (Fig. 1). The participants were introduced to topics such as "Neural Network Building Blocks", "Mastering Model Building", and "Convonutional Neural Networkds". Additionally, they had the opportunity to follow a career development workshop at the end of the school.

The participants eagerly listened to the talks and engaged in hands-on-sesions to apply newly acquired concepts after each theoretical course. Besides the lectures, the school organized social activities, including a quiz night, and a challenge for which the participants were divided into five teams. The challenge involved applying deep learning techniques learned during the school to solve a classification problem. Specifically, participants classified background images of gravitational waves data. This practical exercise allowed them to apply their newly acquired knowledge. We congratulate all winners from team "green", and especially our PUNCH4NFDI member Makarim from Task Area 6 (Fig. 2).

Figure 1 (left): Participants of the ErUM-Data-Hub Deep Learning School "Basic Concepts". Figure 2 (right): Team green, winner of the "GravitySpy Challenge". All Picture Copyright © ErUM-Data-Hub

The DFG has recently released information on proposals for the second funding phase of NFDI consortia[1]. The documents now available include instructions and templates for consortia proposals as well as a supplementary data sheet. As a consortium of the second round, PUNCH4NFDI is not yet in the process of applying for the second funding phase but in the process of writing a progress report for the first funding phase. This report has to be handed in by 30 September 2024.

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].

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[1] https://www.dfg.de/en/news/news-topics/announcements-proposals/2024/ifr-24-24
[2] https://www.punch4nfdi.de/news_amp_events/newsletter/

2. NFDI and related topics

Base4NFDI: The fourth round of proposals to Base4NFDI was submitted in February 2024. This time, the following projects were proposed: *Jupyter4NFDI*, *DMP4NFDI*, and *KGI4NFDI*. While *Jupyter4NFDI* and *KGI4NFDI* have been submitted a second time by now, *DMP4NFDI* was submitted for the first time. Abstracts of the proposals are available on the Base4NFDI web page[3]. The final decision about these proposals was made by the Consortial Assembly of the NFDI in April and all three projects will receive funding.
The next deadline for proposals is on 1 May 2024. New templates for the proposal to the Initialisation Phase have been prepared by the Base4NFDI team and are available online[4].

The first **Base4NFDI User Conference**[5] will take place on 20 – 21 November in Berlin. It aims at members of the NFDI consortia, the wider NFDI community and everyone who is interested to join discussions on the development of basic services. The submission deadline for contributions is 15 May.

To receive further news concerning Base4NFDI, you can now follow the project on LinkedIn[6].

NFDI sections and task forces:

- In April and May 2024, the speakers of the NFDI sections **Common Infrastructures**, **ELSA**, **EduTrain**, and **(Meta)data, Terminologies, Provenance** will be reelected during the respective section meetings. Invitations to the meetings have been sent to all section members. Entitled to vote in a section is only the respective representative in the section of member organisations of the NFDI Association.
- The NFDI section EduTrain has published the fifth version of the **Train-the-Trainer Konzept zum Thema Forschungsdatenmanagement** (in German) in December 2023[7].

3. Formal, legal and financial topics

The consortium has spent more than 3 Mio. Euros in 2023. In fact, many partners had an overspending which could not be compensated. This is mostly due to the increase in personnel costs. Thus, we have already started internal discussions to balance the funding within the consortium in 2024. This also includes the shift of funds to support central issues while decreasing side issues.

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[3]https://base4nfdi.de/projects/all-submissions
[4]https://base4nfdi.de/resources/templates
[5]https://events.gwdg.de/event/658/
[6]https://www.linkedin.com/company/base4nfdi/
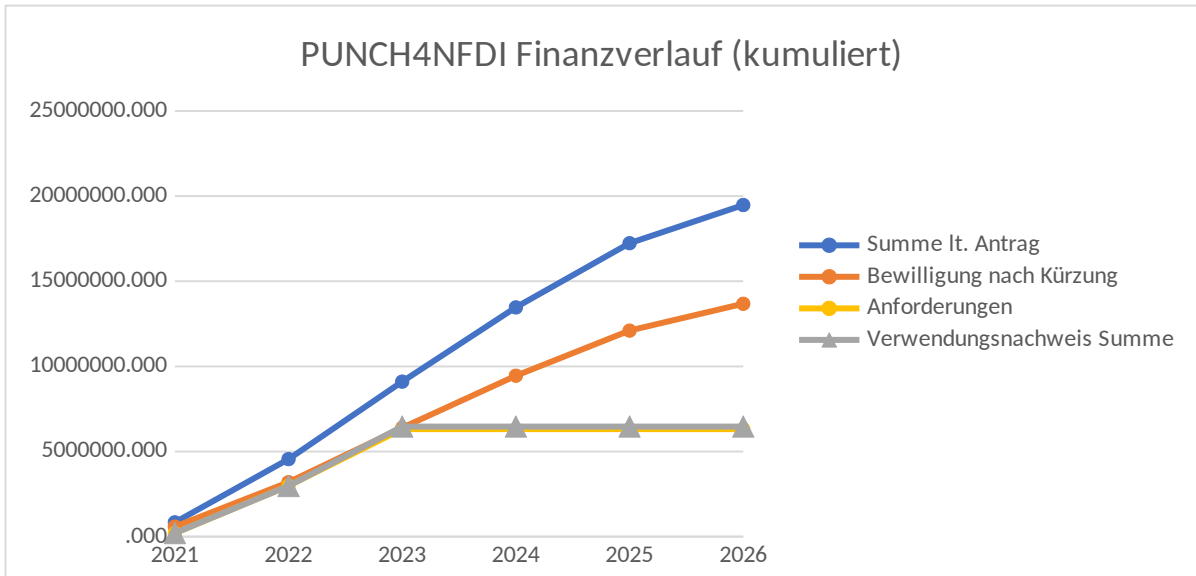[7]https://doi.org/10.5281/zenodo.10122153

Figure 2: Spending profile of PUNCH4NFDI including Q4/2021 – Q4/2023. Blue - proposal; orange - DFG grant; yellow - actual spending; gray - Jahresverwendungsnachweis.

4. Status of the consortium

New people

New people who contribute to the work programme of PUNCH4NFDI are our most valuable asset! In this category of the newsletter, we try to give short introductions of newcomers to the consortium – welcome to everybody!

Elena Sacchi (AIP, TA4 and TA6): After a PhD in Astrophysics at Bologna University and a postdoc at the Space Telescope Science Institute in Baltimore, I joined the Leibniz Institute for Astrophysics in Potsdam as part of the Milky Way and Local Volume group, to work on the formation and evolution of galaxies in the nearby Universe through the analysis of their resolved stellar populations. Since January 2024, I started a new position in the Supercomputing and E-Science group, and joined PUNCH4NFDI to work on the REANA platform and its integration with the existing infrastructure (like Compute4PUNCH and Storage4PUNCH). I am also very passionate about science outreach, and I have been involved in several projects both as a volunteer and as invited lecturer in schools and at public events. Contact: esacchi@aip.de

Nicole Schulte (TU Dortmund University, TA5): I am a Ph.D. student at TU Dortmund University, where I also obtained my bachelor's and master's degrees. My PhD began in 2022, and I joined PUNCH4NDFI in September 2023. The project I am working on is connected with Task Area 5: Data irreversibility. Specifically, it is associated with WP2 and WP5, so "Dynamic filtering" and "evaluation and validation of instrument response and characteristics". In the project, I am working on developing, implementing, and deploying a neural network-based trigger in LHCb. This specific trigger is the main physics trigger in LHCb and aims to select beauty decays inclusively. With the upgrade that LHCb underwent for Run 3, the incoming data stream from the collisions has significantly increased. Therefore, fast data processing with real-time selections is necessary to maintain the limited computing resources. We are thus tasked to provide a software solution for a quick and efficient trigger that will inevitably make irreversible decisions. Furthermore, the performance of this algorithm then needs to be evaluated and validated. Contact: nicole.schulte@tu-dortmund.de

Tobias Kleiner (DESY, TA4): I am currently a PostDoc working in the Gamma Astroparticle division at DESY. I received my B. Sc. and M. Sc. in physics from KIT. Following this I did my PhD at Humboldt University/DESY where I worked with data from the VERITAS telescope studying extended sources, with a special interest on the galactic microquasar SS 433 (also known as V1343 Aquilae). Currently I am involved with the simulation system of the CTA Observatory.

5. Upcoming events and excitements

- On 16 April, the PUNCH Young Academy training **Containers for Use with Docker, Apptainer and Compute4PUNCH**[8] takes place.
- The second workshop organized by the **Physical Sciences in NFDI** will take place on 26 April, online[9]. This edition will feature use cases by PUNCH4NFDI, NFDI-MatWerk and DAPHNE4NFDI. An introduction to Research Data Management will be given by FAIRmat.
- The **9th PUNCH4NFDI General Meeting** will take place online on 20 June. More information will be available in due time on Indico[10].
- A complete list of PUNCHLunches can be found in the intranet and in Indico: https://indico.desy.de/category/743/). If you have suggestions for the seminar series – let us know at info@punch4nfdi.de.

[8]https://indico.desy.de/event/43609/
[9]https://events.hifis.net/event/1503/
[10]https://indico.desy.de/event/43893/

- For a complete list of TA and other working meetings, see the Indico category https://indico.desy.de/category/741/

6. 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[11] and in ZENODO (https://zenodo.org – just search for "PUNCH4NFDI" or – if you are interested in the broader scope – "NFDI").

- Constructing model-agnostic likelihoods, a method for the reinterpretation of particle physics results[12]
- OmniJet-α: The first cross-task foundation model for particle physics[13]
- Presentations at the DPG spring meeting[14][15][16][17]
- Curation and metadata – concepts for data irreversibility[18]

[11] https://results.punch4nfdi.de/
[12] https://arxiv.org/pdf/2402.08417.pdf
[13] https://arxiv.org/abs/2403.05618
[14] https://www.dpg-verhandlungen.de/year/2024/conference/karlsruhe/part/t/session/44/contribution/6
[15] https://www.dpg-verhandlungen.de/year/2024/conference/karlsruhe/part/t/session/17/contribution/2
[16] https://www.dpg-verhandlungen.de/year/2024/conference/karlsruhe/part/t/session/111/contribution/3
[17] https://www.dpg-verhandlungen.de/year/2024/conference/karlsruhe/part/t/session/17/contribution/6
[18] https://zenodo.org/records/10692169