

# The PUNCH4NFDI Consortium

## Newsletter Number 7

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## 1. News and Highlights

At the invitation of the BMBF, members of the Argelander Institute für Astronomie in Bonn presented the interactive **LEGO model of the ALMA observatory** at the open day at the ministry's Berlin office<sup>1</sup> on 19 – 20 August 2023. Around 7,320 people attended the event, including State Secretary Judith Pirscher, who showed great interest in the topic of radio interferometry and was impressed by the interactive exhibit.

Radio interferometry is a very data-intensive endeavour. The ALMA observatory<sup>2</sup> plays an essential role in scientific milestones such as the imaging of black holes. To illustrate how radio interferometers work, the ALMA observatory was built out of LEGO. If you change the position or number of LEGO telescopes, the calculated image changes and is displayed on a screen in real time. This is a playful way of exploring what can be achieved with a radio interferometer.

The first **Conference on Research Data Infrastructure (CoRDI)**<sup>3</sup> was held by NFDI e.V. on 12 – 14 September at KIT in Karlsruhe. More than 600 participants attended the conference which offered several exciting keynotes and over 80 presentations in several tracks. The PUNCH4NFDI consortium contributed one joint presentation together with DAPHNE4NFDI in the community track *Natural Sciences* and several posters to the poster session. In addition, the consortium was represented at the *Market of the Consortia*. Many slides of presentations are available in the CoRDI-Zenodo-Community<sup>4</sup> and all abstracts were published in the Proceedings of CoRDI<sup>5</sup>.



Figure 1: PUNCH4NFDI Annual Meeting 2023, 12 October, LMU Munich

<sup>1</sup><https://www.bmbf.de/bmbf/shareddocs/veranstaltungen/2023/230725-tag-der-offenen-t%C3%BCr.html>

<sup>2</sup><https://www.almaobservatory.org/en/home/>

<sup>3</sup><https://www.nfdi.de/cordi-2023/?lang=en>

<sup>4</sup><https://zenodo.org/communities/cordi-2023/?q=&l=list&p=1&s=10&sort=newest>

<sup>5</sup><https://www.tib-op.org/ojs/index.php/CoRDI/issue/view/12>

On 12 – 13 October, we held the **PUNCH4NFDI Annual Meeting 2023** at LMU in Munich<sup>6</sup>, see Figure 1. The meeting was split into an internal part on the first day and public sessions, including a poster session, on the second day. Slides of the presentations of the public sessions are available on Indico.

Preceding the Annual Meeting was a **one-day training event** by the PUNCH Young Academy on tools and services frequently used within the PUNCH4NFDI consortium or developed with contribution of the consortium<sup>7</sup>.

Philip Bechtle and Astrid Schneidewind (DAPHNE4NFDI) were guests at the **Helmholtz Resonator podcast** with Holger Klein<sup>8</sup>. During almost 90 minutes, they discuss FAIR data, the NFDI and its sections, as well as the consortia DAPHNE4NFDI and PUNCH4NFDI.

To go along with the critical review of our work plan, which was initiated at the PUNCH4NFDI Annual Meeting, we want to call out **PUNCH Unplugged: a week of critical discourse** during **29 January to 2 February 2024**. We strive to have a week of internal and public meetings, where critical questions and constructive feedback are explicitly desired. This week will be complemented by the **8<sup>th</sup> PUNCH4NFDI General Meeting** which will take place on **6 February 2024**.

In case you have news that you want to share with PUNCH4NFDI, don't hesitate to send a mail to [info@punch4nfdi.de](mailto:info@punch4nfdi.de). You can access all newsletters on our web site<sup>9</sup>.

## 2. NFDI and related topics

**Base4NFDI:** The third round of proposals was submitted in August 2023 and comprised three proposals for the initialisation phase – *RDMtraining4all*, *Jupyter4NFDI*, and *nfdi.software* – as well as a proposal for the integration phase for *IAM4NFDI*. Abstracts of all submitted proposals are publicly available on the Base4NFDI web page.<sup>10</sup>

To be considered for funding in the initialisation phase, approval by 25% of the consortia is required. For funding in the integration phase, approval by 50% of the consortia is required. Another requirement for both phases is the support of 2/3 of the TEC members.

Of these four recent proposals, only *IAM4NFDI* will receive funding.

### NFDI sections and task forces:

- The Task Force Evaluation and Reporting has published the *White Paper: Interim Report Reference*<sup>11</sup> as well as a table *Collaborative work in NFDI*<sup>12</sup> on Zenodo.

<sup>6</sup><https://indico.desy.de/event/38458/>

<sup>7</sup><https://indico.desy.de/event/40315/>

<sup>8</sup><https://resonator-podcast.de/2023/res200-die-nationale-forschungsdaten-infrastruktur/>

<sup>9</sup>[https://www.punch4nfdi.de/news\\_amp\\_events/newsletter/](https://www.punch4nfdi.de/news_amp_events/newsletter/)

<sup>10</sup><https://base4nfdi.de/overview-submission-rounds>

<sup>11</sup><https://zenodo.org/records/8296725>

<sup>12</sup><https://zenodo.org/records/8296725>

- A new working group in the section *(Meta)data, Terminologies, Provenance* has been launched on *Research Software Metadata*. The charter of the new working group is available on Zenodo<sup>13</sup>.

### 3. Formal, legal and financial topics

In 2023, the consortium has almost requested all of the granted funds. This is due to the facts that most positions are finally filled and salaries are increasing. A rather small amount of funds were requested to be transferred to next year. The approval of the request is still outstanding. The cumulative spending profile of the consortium is shown in Figure 2.

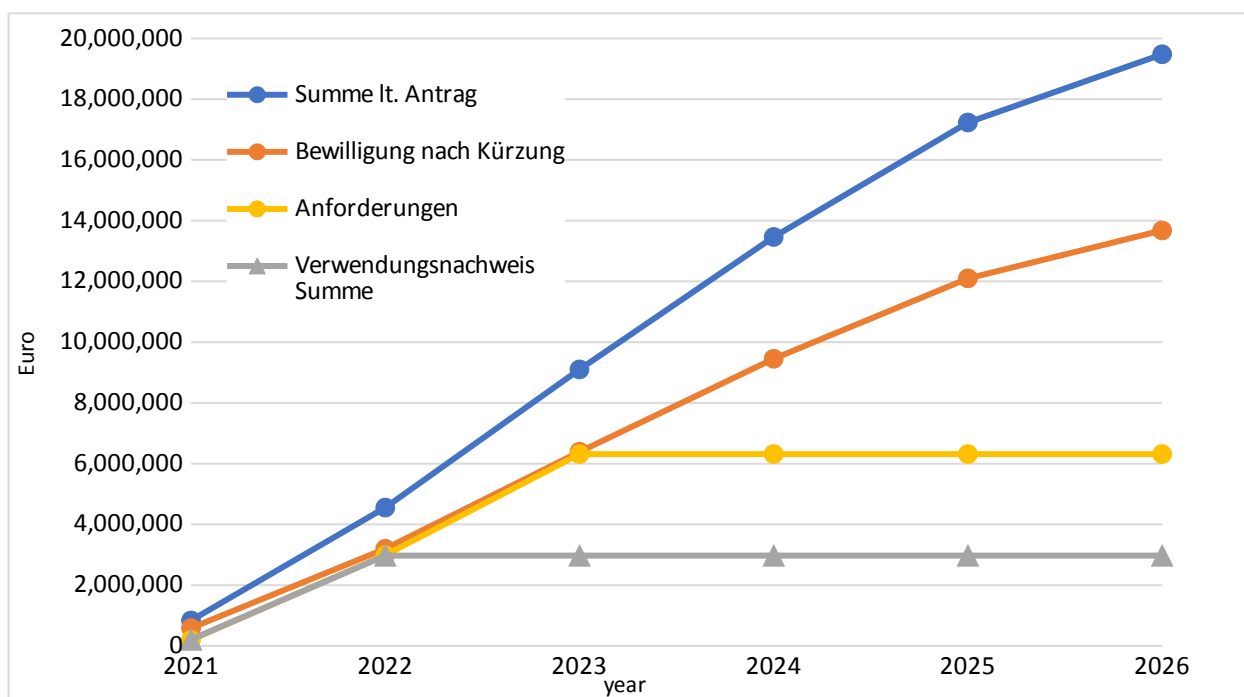


Figure 2: Spending profile of PUNCH4NFDI including Q4/2021 – Q4/2023. Blue - proposal; orange - DFG grant; yellow - actual spending; gray - Jahresverwendungsnachweis.

Ruhr-Universität Bochum, a PUNCH4NFDI participant from the beginning, has joined the NFDI e.V. in October 2023. The Scientific Senat of NFDI e.V. will vote for the assignment of Ruhr-Universität Bochum to the PUNCH4NFDI “Konsortium gemäß Satzung” during their next session in February 2024. *[In an earlier version of this newsletter, it was expressed that Ruhr-Universität Bochum is already assigned to the PUNCH4NFDI “Konsortium gemäß Satzung”. We apologize for this mistake.]*

Furthermore, there were changes on the level of Task Area and Work Package leads: Baida Achkar (U Göttingen) has replaced Kevin Kröninger (TU Dortmund) as Task Area 7 lead, Frank Wagner (FZJ) is new work package lead in TA3 WP2.

<sup>13</sup><https://zenodo.org/records/10036382>

## 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!



**Prateek Gupta (TLS, TA2):** I received a Ph.D. in Physics (Astrophysics and Cosmology) from Savitribai Phule Pune University in Pune, India. I recently joined the PUNCH team at TLS in Tautenburg. In the course of my Ph.D., my main goal was to examine radio signatures from large scale structures of the Universe through semi-analytical modeling of synchrotron radio emission on large N-body + hydrodynamical cosmological simulations. I have been involved in numerical implementations such as filtering turbulence in cosmological flows, studying the velocity structure function at galaxy cluster scales, and developing a new halo/group finding algorithm for arbitrary mass particle systems. Along with that, I have worked for a small IT startup as a developer for two years and developed two successful BOTS (on the crypto and equity markets) - able to make efficient decisions and place orders in the registered user accounts without any human intervention. I recently joined TLS in October 2023. I will be mostly working in Task Area 2 as a Postdoctoral Research Associate with Matthias Hoeft and PUNCH team.

Contact: [prateek@tls-tautenburg.de](mailto:prateek@tls-tautenburg.de)

**Anna Hallin (UHH, TA3):** I am a postdoctoral researcher at the University of Hamburg, working on machine learning for particle physics. I obtained my PhD at Rutgers University in the US, where I worked on anomaly detection with machine learning applied to particle physics and astrophysics. Before that, I obtained my MAST in theoretical physics at the University of Cambridge in the UK and my BSc in physics at the University of Gothenburg in Sweden. In PUNCH I will mainly be working on exploring foundation models for particle physics.



**Sonja Felder (University of Bonn, TA7):** I am working on WP7.3 ("Training, education, outreach, and citizen science", 50%FTE) with a focus on school-related public topics. Among others, I am involved in the further development of a machine learning master class and surveying publicly available (FAIR), secondary school-level materials on data literacy. Beyond PUNCH, I studied Geosciences and Geography at the Universities of Bremen and Newcastle upon Tyne (UK), which were driven by a keen interest on investigating Earth's climatic and oceanographic history. Throughout my studies, I was engaged with outreach projects at University and beyond, e.g. by volunteering in the environmental education sector. I am thrilled to be included in PUNCH and would love to hear more about the tools developed, exciting findings and other produce of the PUNCH-community, which could be included in outreach projects.



**Kristen Lackeos (MPIfR, TA5):** I attended the University of Alabama in Huntsville (in the United States) for my PhD studies, where I worked on numerical relativity (evolving orbits for intermediate mass ratio inspiral systems and studying the self force effect) and theoretical cosmology (dark energy). Now, I am a postdoctoral researcher at Max Planck Institute for Radio Astronomy (MPIfR) in the Fundamental Physics group led by Dr Michael Kramer. There I am part of the Fast Radio Burst subgroup led by Dr Laura Spitler, working on observational astronomy and data analysis. I'm also part of the European Pulsar Timing Array (EPTA) and Laser Interferometer Space Antenna (LISA) collaborations, and a new member of PUNCH! The previous project I participated in at MPIfR involved developing and testing software that collects provenance information from python-based astronomical pipelines. For PUNCH my focus will be dynamic filtering and dynamic archiving in TA5, specifically applied to transient radio astronomy.

**Akshay Eranhalodi (DESY, HU Berlin, TA5):** I am a PhD student at Humboldt University Berlin and DESY working in multi-messenger astronomy. I did my bachelor's and master's degree in physics in India. I have worked with the upgraded Giant Metre Radio Telescope (uGMRT) to study pulsars and fast transients during my master's thesis. Later I worked as a junior research fellow for a year to set up a dedicated Search for Extra-terrestrial Intelligence (SETI) program at uGMRT. Within PUNCH4NFDI I would be part of TA5 - WP 3 group to set up a dynamic archive. Contact: [akshay.eranhalodi@desy.de](mailto:akshay.eranhalodi@desy.de)



**Mukul Mhaskey (TLS, TA2):** I did my PhD in Extragalactic Astrophysics from University of Pune, India. I am employed in TLS, Tautenburg as a Post doctoral fellow since 2019. Study of active galaxy nuclei in the radio wavelength is my primary area of research. I joined the TLS working group for PUNCH4NFDI with a focus on Storage4PUNCH and look forward to contribute towards implementing and testing the PUNCH infrastructure for astronomy. Contact: [mukul@tls-tautenburg.de](mailto:mukul@tls-tautenburg.de)

**Timo Saala (U Mainz, TA3):** I am Timo Saala from Germany, currently a PhD student in Mainz working in a project concerned with applications of Adversarial Deep Learning in the context of HEP. I received my B. Sc. and M. Sc. in computer science from the University of Mainz, in which I was also studying applications of Deep Learning within particle physics. In PUNCH4NFDI I am a part of TA3 as my main expertise is around data science and machine learning. Contact: [tisaala@uni-mainz.de](mailto:tisaala@uni-mainz.de)





**Pranev Limaye (MPIfR, TA7):** I am a Masters student at the Argelander Institute for Astronomy in Bonn, Germany. I am currently finishing my masters courses and will soon begin my masters thesis. In terms of research, I work at the Max Planck Institute for Radio Astronomy in the ‘fundamental physics’ group led by Prof Michael Kraemer. My interests are studying young pulsars and trying to connect a link between these exotic objects and Fast Radio Bursts. I also started working with PUNCH related activities within the same research group as a student part-time job. I work in TA-7 WP-4 and am concerned with preparing Effelsberg-100m telescope old archived datasets into a FITS file format which could be made easily accesible to the outside community.

Contact: [limaye@mpifr-bonn.mpg.de](mailto:limaye@mpifr-bonn.mpg.de)

**Susanne Baars (DESY, TA1):** I joined DESY in October 2023 to work with financial project administration. I'm coming from a position as project assistant at the University Medical Center in Hamburg, where I worked with administrating health care projects and collaborations with other health care institutions aimed to improve e.g. stroke aftercare or breast cancer prevention.



## 5. Upcoming events and excitements

- **In-person TA5 workshop** at DESY Zeuthen, jointly organised with HU Berlin, 18 – 19 January 2024: specify concepts and methods within TA5, and especially how these overlap between the different WGs and how a dynamical archive should interpret them.
- During 29 January – 2 February 2024 **PUNCH Unplugged: a week of critical discourse**
- **8<sup>th</sup> PUNCH4NFDI General Meeting**<sup>14</sup> on 6 February 2024 (online)
- 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](mailto:info@punch4nfdi.de).
- 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<sup>15</sup> and in ZENODO (<https://zenodo.org> – just search for “PUNCH4NFDI” or – if you are interested in the broader scope – “NFDI”).

<sup>14</sup><https://indico.desy.de/event/42298/>

<sup>15</sup> <https://results.punch4nfdi.de/>

- White Paper: Umgang mit Zielen der BLV als Grundlage für die Strukturreevaluation<sup>16</sup>
- List of Lattice QCD codes<sup>17</sup>
- PIDs in the Natural Sciences<sup>18</sup>
- First Digital Research Products executed on the PUNCH4NFDI Science Data Platform<sup>19</sup>
- The PUNCH4NFDI Science Data Platform (SDP) and Digital Research Products (DRPs)<sup>20</sup>
- LatticeQCD/AnalysisToolbox: v1.1.0<sup>21</sup>
- Towards a FAIR Digital Research Product Demonstrator: the CTAO Simulation Pipeline<sup>22</sup>
- Survey of Astrophysics Simulation Codes in Germany: An initiative of the PUNCH4NFDI consortium<sup>23</sup>
- ML Approach to Infer Galaxy Cluster Masses from eROSITA X-Ray Images<sup>24</sup>

<sup>16</sup><https://zenodo.org/records/8192533>

<sup>17</sup><https://results.punch4nfdi.de/?md=/docs/Compute/Codes/lqcd-codes.md>

<sup>18</sup><https://zenodo.org/records/8368436>

<sup>19</sup><https://zenodo.org/records/8358506>

<sup>20</sup><https://zenodo.org/records/8358550>

<sup>21</sup><https://zenodo.org/records/8368581>

<sup>22</sup><https://zenodo.org/records/8434461>

<sup>23</sup><https://dias.ie/chaica5/index.html#programme>

<sup>24</sup><https://indico.cern.ch/event/1253794/contributions/5588617/>