

ErUM-Data-Hub & DIG-UM present

# Sustainability in the Digital Transformation of Basic Research on Universe & Matter

Third Program Committee Meeting

10.04.2025



GEFÖRDERT VOM

Bundesministerium  
für Bildung  
und Forschung



**ERUM**  
DATA HUB

# Agenda

- Short Recap & Overview
- Discussion:
  - Title
  - Timetable
  - Invitations
- AOB

All Info & Documentation: <https://wiki.erumdatahub.de/bin/view/Sustainability2Planning/>



# Program Committee

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# ErUM-Data Calendar

< > today

2025

month year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1	We	Sa	Sa	Tu	Th	Su	Tu	Fr 2nd	Mo	36We	Sa	Mo	49	
2	Th	Su	Su	We	Fr	Mo	23We	Sa	Tu	Th	Su	Tu		
3	Fr	Mo	6Mo	10Th	Sa	Tu	Th	Su	We	Fr	Mo	45We		
4	Sa	Tu	Tu	Fr	Su	We	Fr	Mo	32Th	Sa	Tu	Th	ErUM-	
5	Su	We	We	Sa	Mo	19Th	Sa	Tu	Fr	Su	We	Fr		
6	Mo	2Th	Transfer Workshop:	Th	Su	Tu	5th Deep Learning School Basic	Fr	Sa	Mo	41Th	Sa		
7	Tu	Fr	Fr	Mo	15We	Sa	Mo	28Th	Su	Tu	Fr	Su		
8	We	Sa	Sa	Tu	Th	Su	Tu	Fr	Mo	37We	Sa	Mo	50	
9	Th	Su	Su	We	Fr	Mo	24We	Sa	Tu	Th	Su	Tu		
10	Fr	Mo	7Mo	11Th	Sa	Tu	Th	Su	We	Fr	Mo	46We		
11	Sa	Tu	Tu	Fr	Su	We	Fr	Mo	33Th	Sa	Tu	Th		
12	Su	We	We	Sa	Mo	20Th	Sa	Tu	Fr	Su	We	Fr		
13	Mo	3Th	Th	DIG-UM Big Data	Su	Tu	Fr	Su	We	Sa	Mo	42Th	Sa	
14	Tu	Fr	Fr	Mo	16We	Sa	Mo	29Th	Su	Tu	Fr	Su		
15	We	Sa	Sa	Tu	Th	Su	Tu	Fr	Mo	6th Deep Learning Train-the-Trainer Workshop	38We	Sa	Mo	51
16	Th	Su	Su	We	Fr	Mo	EuCAIFCor 2025	25We	Sa	Tu	Th	Su	Tu	
17	Fr	Mo	8Mo	12Th	Sa	Tu	21Th	Su	We	34Th	Fr	Mo	47We	
18	Sa	Tu	Tu	Fr	Su	We	Fr	Mo	34Th	Sa	Tu	Th		
19	Su	We	We	Sa	Mo	21Th	Sa	Tu	Fr	Su	We	Fr		
20	Mo	4Th	Th	Su	Tu	Fr	Su	We	Sa	Mo	43Th	Sa		
21	Tu	Fr	Fr	Mo	17We	Sa	Mo	30Th	Su	Tu	Fr	Su		
22	We	Sa	Sa	Tu	Th	Su	Tu	Fr	Mo	39We	Sa	Mo	52	
23	Th	Su	Su	We	Fr	Mo	26We	Sa	Tu	Th	Su	Tu		
24	Fr	Mo	9Mo	13Th	Sa	Tu	PYOPP - Publish Your Own Python	Th	Su	Fr	Mo	48We		
25	Sa	Tu	Tu	Fr	Su	We	Fr	Mo	35Th	Sa	Tu	Th		
26	Su	We	We	Sa	Mo	22Th	Sa	Tu	Fr	Su	We	Fr		
27	Mo	5Th	Th	Su	Tu	Fr	Su	We	Sa	Mo	44Th	Sa		
28	Tu	Fr	Fr	Mo	18We	Sa	Mo	2nd Workshop on Sustainability	31Th	Su	Tu	Fr	Su	
29	We		Sa	Tu	Th	Su	Tu	Fr	Mo	40We	Sa	Mo	1	
30	Th		Su	We	Fr	Mo	27We	Sa	Tu	Th	Su	Tu		
31	Fr		Mo	14	Sa		Th	Su		Fr	We			

# In-person Workshop in 2025: Sustainability (& Ethics) in ErUM-Data

## 2025:

- In-person Workshop
- 28 July - 1 August 2025, Aachen
- Timetable: <https://indico.desy.de/event/47133/>
- All planning info & contents: <https://wiki.erumdatahub.de/bin/view/Sustainability2Planning/>

**Subgroups 2023:** Footprint, Dynamic Energy Supply, Hardware Lifetime, Hardware & Algorithms, Smart Data, Cultural Change, Autonomization, Inquiries & Dynamics, Algorithms & Software, Machine Models, Injected Intelligence, Workflows & Stakeholders



# In-person Workshop 2025: Concept & Title

## Concept:

- 2 Topic Workshop (Sustainability & Ethics)
- Following 1 narrative
- Meta thinking & concrete action (large target group)

“Framework conditions for future research in ErUM in view of ultra-fast AI developments and the urgent need for sustainability in the area of digital transformation“

**Done: Decide on title**

**Shaping the Digital Future of ErUM Research: Sustainability & Ethics**



# Monday

## Session 1 (30min):

### Welcome, Introduction & Orga

- Done: Assign speaker
- Welcome: Martin Erdmann (Incl. info on publication 2024)
- Orga: Angela Warkentin

## Session 2 (90min):

### Review & Starting point: Are we on the right track?

- Short updates of initiatives and conclusion by moderator
- To-Do: Invite Projects / Initiatives (Angela)
  - "Quantifying imperfect cognition with realized information gain" (T. Ensslin)
  - Know your footprint: status and next steps (Pardis / Simran)
  - ...
- Hub will look through contributions from 2024 online meetings and invite projects. If you want to see specific updates in this session, please let Angela know.
- Assign moderator: Angela

16:00	Registration & Reception	
	<i>Erholungs-Gesellschaft Aachen 1837</i>	15:30 - 16:30
	<b>Welcome: Introduction</b>	
	<i>Erholungs-Gesellschaft Aachen 1837</i>	16:30 - 16:45
	<b>Welcome: Orga &amp; About this workshop</b>	
	<i>Erholungs-Gesellschaft Aachen 1837</i>	16:45 - 17:00
17:00	Review & Workshop starting point: Are we on the right track?	
	<i>Erholungs-Gesellschaft Aachen 1837</i>	17:00 - 18:30
18:00		
19:00	Welcome-Dinner	
	<i>Erholungs-Gesellschaft Aachen 1837</i>	18:30 - 20:30
20:00		



# Tuesday: Focus on Sustainability

## Session 3 (60 - 120min):

### Invited Talk(s) on Sustainability

- **To-Do: Invite speaker**
  - **Suggestions:**
    - Wolfgang Gründinger (**To-do, Thomas: Invitation**)
    - Sustainability implementation at major research facilities e.g. CERN, DESY (e.g. Serge Claudet) (**To-Do, Günter: Invitation**)
    - Full life cycle assessment of c02 footprint (production, cooling water, disposal). (**To-Do, Markus Schumacher: Invite Öko-Institut e.V & Matthias Wadenstein, WLCG**)
    - Anne Currie - CEO of Strategically Green, Organisation Member of Green Software Foundation (**To-Do, Dwayne: Invitation**)

**Suggestions for further invitations that can be issued in a second round of invitations are collected on the next slide.**

## Session 4 (120min): 2x60min (2 sessions)

### Parallel Sessions on Sustainability

- **Done: Open call for abstracts**
- **To-Do: chairs for parallel sessions (Angela)**

## Session 5 (90min): Plenary Discussion

### Sustainability & Future of Digitization in ErUM-Data

- **Done: Assign Moderator (Dwayne)**

## Session 6 (90min):

### Paper writing / Result preparation

- **Idea: A paper detailing how to combat the practicalities of tackling sustainability issues (in Germany) with focus on concrete action**
- **To-Do: Prepare collaborative Overleaf session and coordinate writing session**



# Tuesday: Suggestions for Talks

## Suggested Talks:

- What new ansatzes (approaches) exist, what should we try
- Sustainability implementation at major research facilities e.g. CERN, DESY (e.g. Serge Claudet, Cern energy management panel)
- Full life cycle assessment of c02 footprint (production, cooling water, disposal): Markus Schumacher could ask Öko-Institut e.V (Markus Sch,) or Matthias Wadenstein, WLCCG
- Overview of ideas in SUSFECIT research network (proposal handed in 2024 ErumM Data call)
- International sustainability projects in science (WLCCG, EU, ...)
- Rafaela Hillerbrand (Markus Schumacher)

## Suggested by Simran (Symposium der Deutschen Physikalischen Gesellschaft: Die Zukunft unseres Klimas)

- Maren Urner (FH Münster): „Warum die Klimakrise im Kopf beginnt – und gelöst werden muss“
- Christine Lemaitre (Geschäftsführender Vorstand, Deutsche Gesellschaft für Nachhaltiges Bauen - DGNB e.V., Stuttgart): „Warum Nachhaltiges Bauen uns alle angeht“
- Tom Brown (Institut für Energietechnik, TU Berlin): „Infrastrukturplanung auf dem Weg zur Klimaneutralität“
- Marlene Kretschmer (Institut für Meteorologie, Universität Leipzig): „Herausforderungen und Chancen bei der Vorhersage extremer Wetter- und Klimaereignisse“
- Christopher Schrader (freier Wissenschafts-Journalist, Hamburg): „Beim Konflikt von Werten und Fakten verlieren die Fakten“



# Tuesday: Focus on Sustainability

Participants will choose topic group in registration form (first & second choice possible)

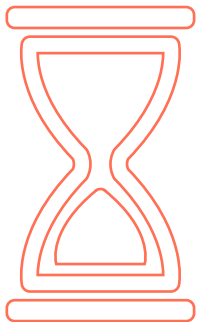
Topic	Possible Contents	Moderator / Preparation
Future of Science & Teaching	<ul style="list-style-type: none"><li>• How will ErUM science change in future?</li><li>• Knowledge transfer &amp; education: what concepts will stay to be important, what will be new?</li></ul>	Judith Reindl, Martin Erdmann?
Spreading & Enhancing Motivation	<ul style="list-style-type: none"><li>• How to support ErUM-Data Sustainability projects &amp; initiatives?</li><li>• How do we ensure the impact on users is managed so that they actively participate?</li><li>• Sustainability Communication: how to spread motivation among scientists.</li></ul>	
AI / Sustainable Programming & Footprint	<ul style="list-style-type: none"><li>• If software gets more efficient by factor n will then e.g. simulation run factor n more or will stop after initial goal reached?</li><li>• What are the implications for users?</li></ul>	
Hardware & Footprint	<ul style="list-style-type: none"><li>• How to handle CO2-budget of the production of hardware</li><li>• Ethical implications of Life Cycle analysis (where machines are made - where they end up)</li></ul>	Markus Schumacher? (may contact Öko Institut e.V.)
Sustainable ErUM research centres of the future (& the ethics of how we run them)	<ul style="list-style-type: none"><li>• Footprint</li><li>• Full life cycle analysis</li><li>• What do future data-centres look like and what informs this</li><li>• Ecology: How computing centres fit into the local surroundings (e.g. re-using waste heat to provide heat for farming vegetables)</li><li>• Novel power sources for datacentres: building datacentres where power is being generated</li></ul>	

# Wednesday: Hearing different Perspectives & Bridging Sustainability & Ethics

## Session 7 (60min):

### Invited Talk(s)

- **Political View(s)**
- **To-Do: Decide on talks & invite speaker**
- **Suggestions:**
  - Herr Hess (Talk)
  - <https://www.umweltbundesamt.de/themen/digitalisierung/gruene-informationstechnik-green-it/rechenzentren#undefined>



**This “political part” on Wednesday is on-hold in the planning until the discussion at the next Digitization Board Meeting!**

## Session 8 (120min):

### ErUM-Data Strategy Lab: In Dialogue with Stakeholders

- Discussion with Stakeholders about political aspects
- Get Stakeholders together (to work together; integrate different point of views:)
  - BMBF: What does the BMBF expect? Base for next proposals (clear criteria, direction, complete picture, dos and don'ts)
  - Political barriers to sustainability (laws & regulations)
  - Politische Zwänge (“wir gehen nicht nach Polen, weil deren Strom so dreckig ist” or “If we fund it here we also want to run it here and not in Norway, Iceland”)
  - Other Stakeholders? („Leitlinien für konkretes Handeln mit Stakeholdern ausarbeiten“)
- **To-Do:**
  - **Decide whether and how we can realize this format and who could moderate**
  - **Will be discussed in the next Digitization Board Meeting (Thomas)**



# Wednesday: Hearing different Perspectives & Bridging Sustainability & Ethics

## Session 9 (60 - 90min): Invited Talks

- **Bridging Sustainability & Ethics**

- **To-Do: Invite speaker**

- **Suggestions:**

- Maren Urner (FH Münster): „Warum die Klimakrise im Kopf beginnt - und gelöst werden muss“ (To-do, Simran: Invitation)
- Anders Levermann, PIK (To-do, Martin Gasthuber: Invitation)



# Thursday: Focus on Ethics

## Session 10 (90min): Invited talks on ethics

- **To-Do: Invite speaker**

### Suggestions:

- **Introduction to the idea of ethics: Janosch Delcker (Invitation issued by Thomas, confirmation pending)**
- **Someone from the Deutscher Ethikrat talking about assessment of technologies in the domain of “AI++” (To-Do, Angela: Invitation)**
- **Johannes Hartel (To-Do, Jan: Invitation)**
- **RWTH Aachen AI Center Ethik Kommission (To-Do, Angela: Discuss possibilities of participation /talks in workshop)**

## Session 11 (90min):

### Contributions on Ethics

- **Done: Open call for abstracts**

## Session 12 (120min):

### Plenary Discussion

#### Possible Focus:

- **Using AI in Teaching**
- **Effect of AI on Sustainability**
- **Does AI replace human creativity in ErUM Research?**
- **How will it be possible to realize predominantly human-performed research activities with the support of AI tools in the future? What is our contribution? Can we formulate a range (Korridor) for this?**
- **To-Do: Assign moderator (incl. preparation)**

## Session 13 (60min):

### Paper writing / Result preparation



# Friday: Workshop Conclusion & Farewell

## Session 14 (90min): Workshop Conclusion & Next Steps

- **Plenary Discussion**
  - Workshop Conclusion
  - Formation of focus groups for the implementation of identified guidelines from multiple projects, beyond the workshop (e.g. Connect Workshop 2024)
  - Criteria for a third workshop that assess the implementation of defined action
- **To-Do: Assign moderator (incl. preparation)**

## Session 15 (60min):

Paper writing / Result preparation

## Session 16 (30min):

Wrap-up & Farewell

- **To-Do: Speaker**
  - **Wrap-Up:**
  - **Farewell / Orga: Angela**

	<b>Coffee</b>	
	Erholungs-Gesellschaft Aachen 1837	08:30 - 09:00
09:00	<b>Workshop conclusion &amp; Next steps: Plenary discussion</b>	
	Erholungs-Gesellschaft Aachen 1837	09:00 - 10:30
10:00	<b>Coffee</b>	
	Erholungs-Gesellschaft Aachen 1837	10:30 - 11:00
11:00	<b>Paper writing / Result preparation: Final touches</b>	
	Erholungs-Gesellschaft Aachen 1837	11:00 - 12:00
12:00	<b>Wrap-Up &amp; Farewell</b>	
	Erholungs-Gesellschaft Aachen 1837	12:00 - 12:30
13:00	<b>Lunch</b>	
	Erholungs-Gesellschaft Aachen 1837	12:30 - 13:30



# Summary

- Done:
  - Finish Indico page
  - Open registrations
- To-Do:
  - Register
  - Issue Invitations
  - Outreach, starting April 28th (all)
- Next steps:
  - How do we want to prepare the results?
  - Can we implement the political part?
  - Coordination as far as possible by mail
  - After June 6th:
    - Evaluate submitted contributions and plan parallel sessions (topics, chairs, etc.)
    - Fill program and start second invitation round if necessary
    - Details



# Backup