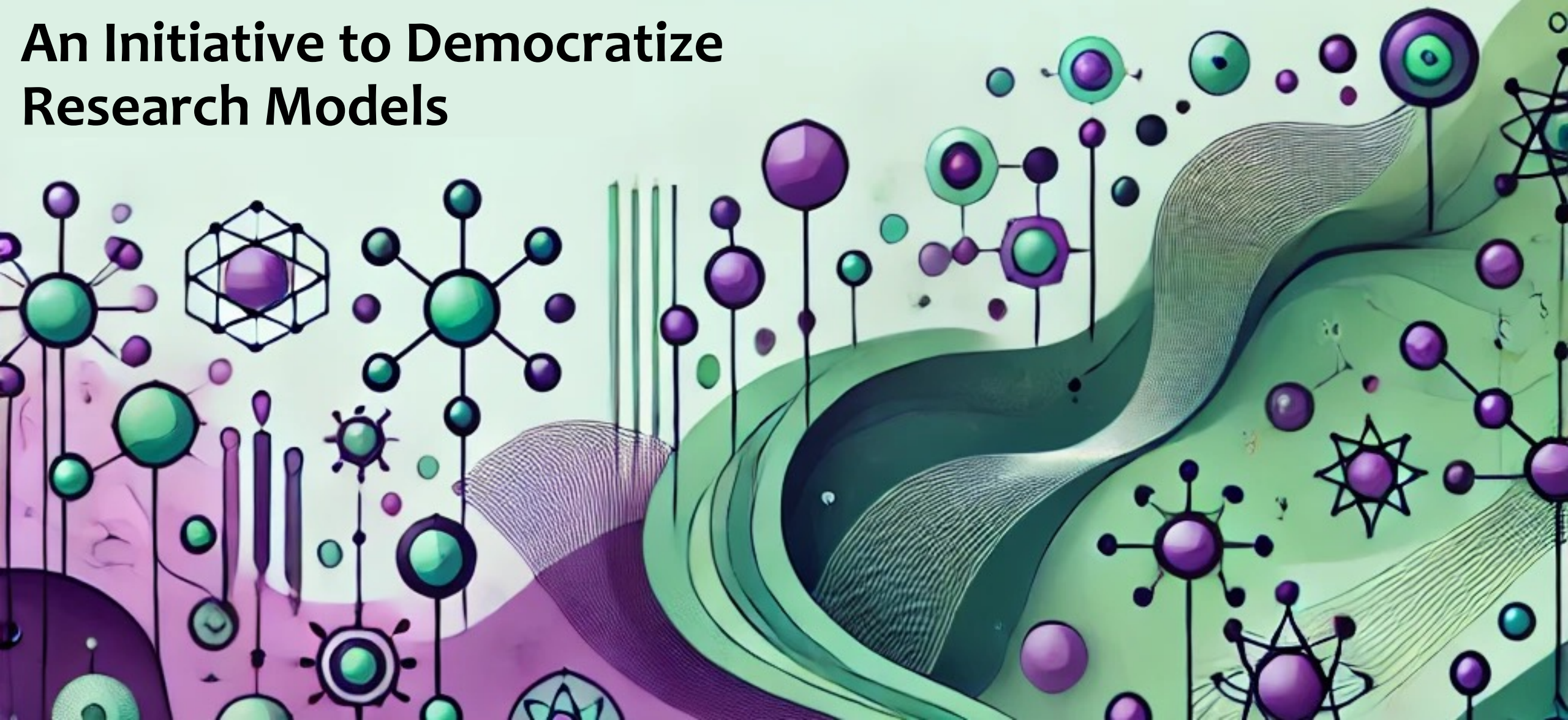


An Initiative to Democratize Research Models



Mikhail Mikhasenko, LHCb, Ruhr University Bochum, 25/11/2024

Problem to solve – sharing complex models

What are our **model**?

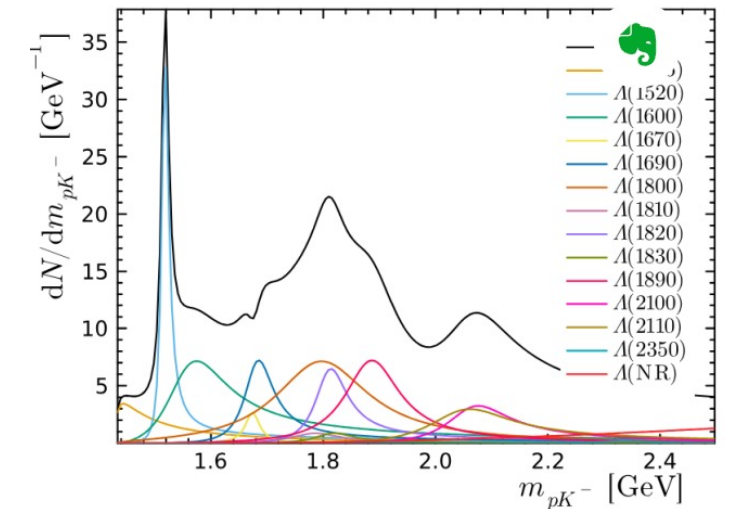
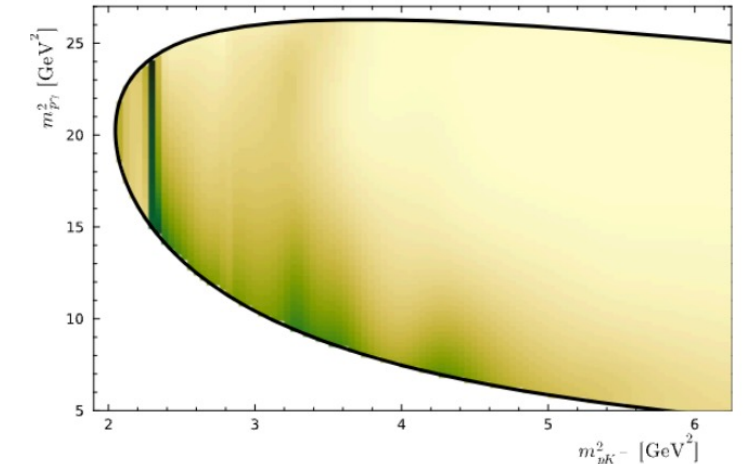
– an operation to transform input (kinematic) variables to probabilistic output.

- *Static*: no internal state
- *Deterministic*: pure functions of input
- *Parametric*: controlled by external parameters

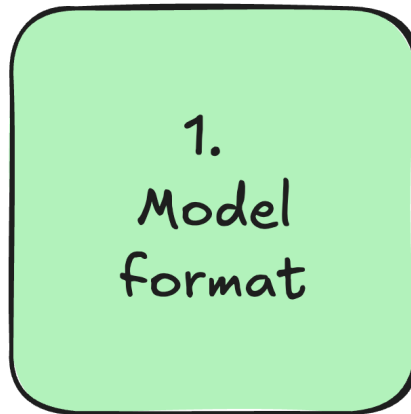
Examples:

- $\pi\pi$ S-wave parametrization (Madrid/Gatchina/...)
- complex Dalitz plot of $D \rightarrow 3\pi$

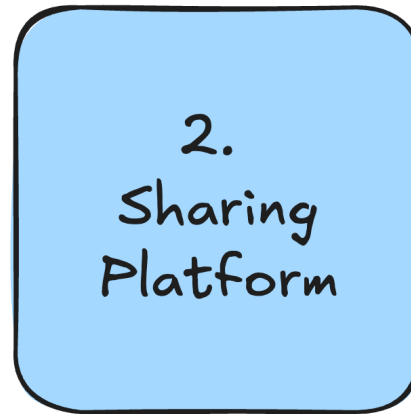
[LHCb-PAPER-2023-036]



Project pillars



standardize functions
standardize operations
how to read
how to write



database
search interface
documentation
templating*



diverse examples
rewards
participation of
big players

About the call

One call in three lines:

- *Software and Algorithms*
- *Research data management*
- *Federated infrastructures*

Classification into one of the three pillars is done by the applicant (unknown budget share)

Deadline: 15th January 2025

Start: 1st October 2025

Where can I find further information?

Information on the ErUM-Data call and upcoming funding period:

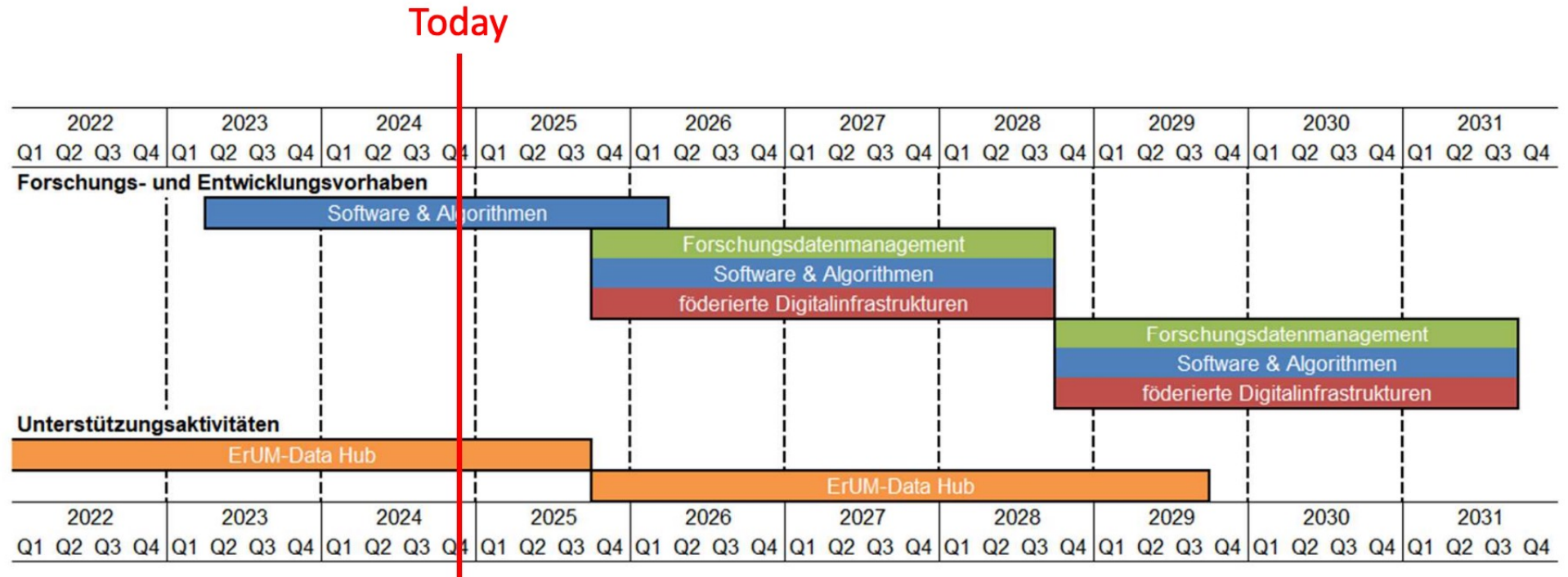
- Announcement of ErUM-Data Call: [Bundesanzeiger](#)
- Deadline for submitting applications is 15. Jan 2025
- Start of funding period is 1. Oct. 2025
- Antragsberatung, Aktionsplan, General Info (PT.DESY/BMBF Slides): [Informati](#)

How to apply:

- Information and help from PT.DESY: [Hinweise zur Antragstellung](#)
- Easy online Antragssystem & Formularschrank: [PT.DESY](#)
- Contact information PT.DESY: [Mail and Phone](#)

[from ErUM Data Hub](#)

ErUM-Data: Timeframe and implementation



Software and algorithms (2022) with a focus on AI and Machine Learning:

- 55 projects in **10 groups** are funded (which? – not public info)
- Financial volume: ~17,4 Mio. €

[From BMBF presentation](#)

Requirements

- funding measure aims towards setting up structures for the **whole community** or beyond
- potential for **transfer of methods**
- build **synergies** and create knowledge transfer
- **No isolated solutions** that only apply to one experiment or one research group
- Encourage collaboration with non-ErUM subject areas like mathematics, informatics and other subjects with technological reference
- Encourage collaboration with companies and transfer into economy/industry
- **Sustainability:** project preferably contains aspects that pay into the UN Sustainable Development Goals
- Encourage exchange, communication and transfer into society

[From BMBF presentation](#)

Project this year






Incomplete list from Aachen meeting

Possible collaborations:

- **FCompute**: running CI for model validation
- **FStorage**: storing models, giving DOI
- **FAnalysis**: binder-like exploration interface

The collaboration is to be clarified and stated in the proposal

[From BMBF presentation](#)

→	Federated Compute (SUSFECIT) Markus Schumacher et al. 
	INC Invention Center, Aachen 14:45 - 14:50
→	Federated Storage Christian Voss et al. 
	INC Invention Center, Aachen 14:50 - 14:55
→	Federated Analysis Facilities Thomas Kuhr 
	INC Invention Center, Aachen 14:55 - 15:00
	ASAP::O Mikhail Karnevskiy 
	INC Invention Center, Aachen 15:00 - 15:05
	Astronomy Markus Demleitner
	INC Invention Center, Aachen 15:05 - 15:10
US →	HEPModel Mikhail Mikhasenko 
	INC Invention Center, Aachen 15:10 - 15:15
	yet another consortium Holger Stiele
	INC Invention Center, Aachen 15:15 - 15:20
	yet another consortium
	INC Invention Center, Aachen 15:20 - 15:25

How the writing goes

We write together a common part

Every institute add local budget

For every field, we need:

- **state of the art (how),**
- **a working example of new format (description, validation block)**

FIRM: Federated Infrastructure for Research Models
Overview of the research consortium
funding period 01/10/2025 - 30/09/2028

John Bulava, Miriam Fritsch, Julia Tjus, Evgeny Epelbaum, Mikhail
Mikhasenko,
Ruhr University Bochum;

Niels Hüsken,
Mainz;

Bernhard Ketzer,
HISKP, Bonn;

Uwe Hernandez,
Helmholtz Intitute, Dresden;

Cornelius Grunwald, Carsten Burgard,
TU Dortmund;

Lukas Heinrich, Philipp Eller,
TUM;

Thomas Kuhr, Giordon Stark, Lorenz Gärtner,
LMU;

Oliver Schulz,
Max Plank for Physics, Munich

Monday Morning

Discussion of the **model format**:

- What we have already
- How well it fits fits other domains

Exercise: how your model fits

10-12h (I leave for a lecture)

Mon 25/11

09:00	Introduction NB2/170, Ruhr-Universität Bochum Campus 09:00 - 09:30
	Model format NB2/170, Ruhr-Universität Bochum Campus 09:30 - 10:00 Remco De Boer 
10:00	Discussion of model format NB2/170, Ruhr-Universität Bochum Campus 10:00 - 11:30 Dr Carsten Burgard et al. 
11:00	Exercise: make example of your model in json NB2/170, Ruhr-Universität Bochum Campus 11:30 - 12:30
12:00	Lunch NB2/170, Ruhr-Universität Bochum Campus 12:30 - 13:30
13:00	

Mo Afternoon

Note:

- Daniela Klobes (our secretary) will talk about logistics:
 - Formalities, and
 - How to submit BMBF application
- Andy Buckley might connect to share

	Lattice QCD Models	<i>John Bulava</i>
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	13:30 - 14:00
14:00	Nuclear Physics Models	<i>Evgeny Epelbaum</i>
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	14:00 - 14:30
	Frameworks and formats	<i>Lorenz Gartner et al.</i>
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	14:30 - 15:00
15:00	Learning from RIVET	<i>Andy Buckley</i>
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	15:00 - 15:30
	Formalities and secretarial support	<i>Daniela Klobes</i>
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	15:30 - 16:00
16:00	Discussion on project pillars	
17:00		
	<i>NB2/170, Ruhr-Universität Bochum Campus</i>	16:00 - 18:00

Tuesday

Domains:

- QED
- Dark Matter Center
- Neutrino Physics

Discussion on essential work

09:00	Models in Neutrino Physics NB2/170, Ruhr-Universität Bochum Campus	<i>Julia Tjus et al.</i> 09:00 - 10:00
10:00	QED Xfel models NB2/170, Ruhr-Universität Bochum Campus	<i>Dr Uwe Hernandez Acosta</i> 10:00 - 10:30
	Dark Matter Center NB2/170, Ruhr-Universität Bochum Campus	<i>Philipp Eller</i> 10:30 - 11:00
11:00	Example of community service NB2/170, Ruhr-Universität Bochum Campus	<i>tbc tbc</i> 11:00 - 12:00
12:00	Lunch	
13:00	Portal and Community engagement	
14:00		

