

RUB

Research data management in the CRC 1316

17.05.2022

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The CRC 1316 in two minutes

Research focus

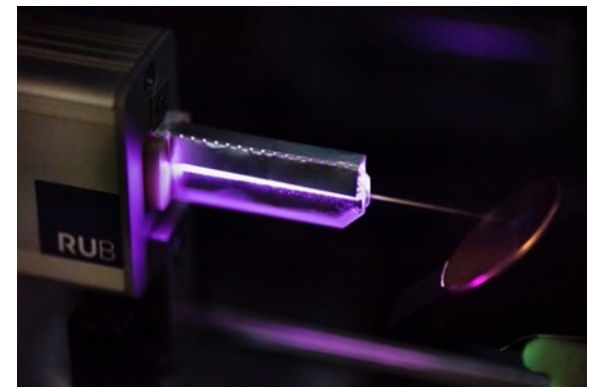
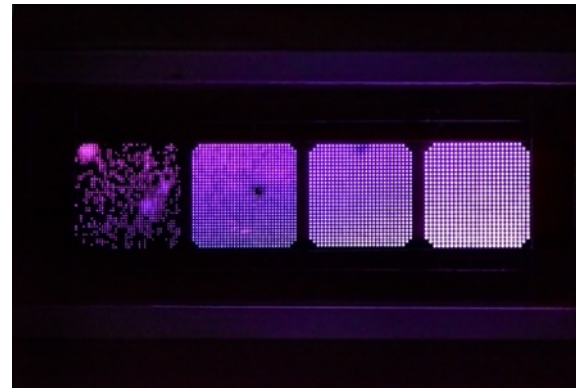
- Plasma catalysis
- Non-equilibrium plasmas are a very flexible tool to convert electricity into reactivity

Challenges

- Energy and mass efficiency
- Durability of the interfaces
- Process windows, catalyst poisoning
- Scaling and flexibility of the system

Research groups

- Plasma physics, plasma technology, chemistry, biology





First QPTDat workshop 01/2020



eLabFTW in all groups



Kick-off meeting CRC1316

2019: letter of commitment btw. QPTDat and CRC1316

INF project of the CRC 1316 starts



Repository filled by all groups

'Interpersonal skills are key to the success of the Data Steward'



Data experts



Challenge

Organizational

- Various research group work within the CRC 1316
- Research focus varies strongly
- Communication to all researchers required

RDM related

- Knowledge of groups on RDM differs
- Demands on RDM are not homogenous btw. groups



Measures

- ✓ All dates available on <https://sfb1316.rub.de/index.php/en/support-projects/research-data-management>
- ✓ Mailing address **sfb1316+rdm@rub.de**

INP RUB Meeting On Friday, 26.11.2021, scientists from Greifswald and Bochum met in a zoom meeting to discuss about metadata of atmospheric pressure plasmas. From both sides the meeting was led by RDM representatives. The results will be used in the development of metadata standards in plasma physics. The next meeting is on 21.01.2022 on low pressure plasmas.	Event list research data management ■ Research Data Management - International Exchange of Experience IT Services RUB, SFB 1280, CRC 1316 (RUB, Uni Oulu) 2022-05-11 at 9:00 to 2022-05-12 Location: RUB Under the motto "Research data instead of mining coal", UA Ruhr is organizing an international exchange of experience on data
RESEARCH DATA MANAGEMENT Data Stewards The challenge of the INF project's work in CRC 1316 is the diversity of the individual review boards. Here, therefore, it makes sense for communication to take place through representative contacts in the	RESEARCH DATA MANAGEMENT POLICY Collaborative Research Centre 1316 (CRC 1316) – Research Data Management Policy



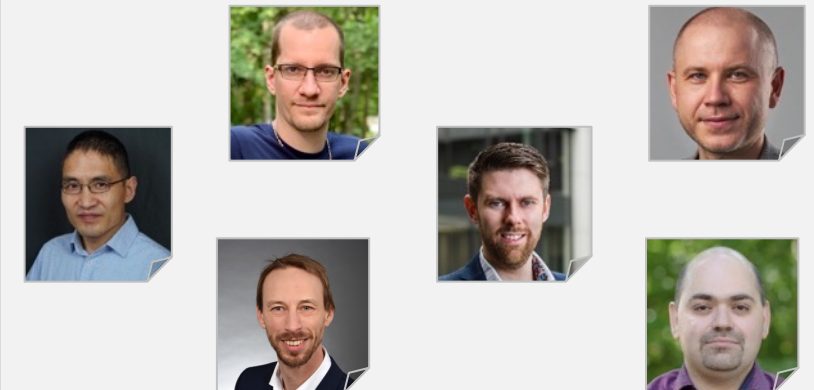
Data experts

INF ↔ Data experts

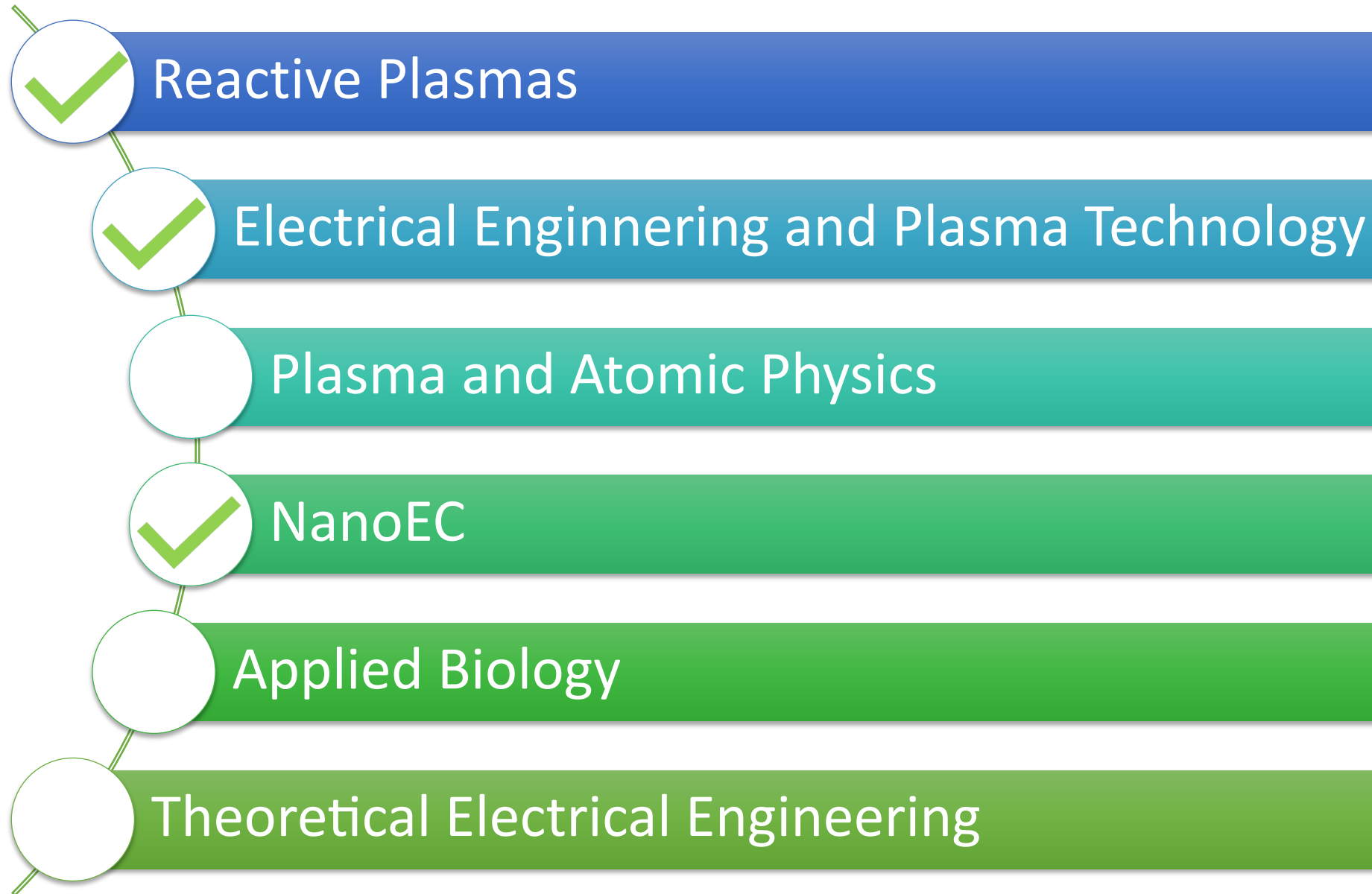
- Exchange on demands
- Exchange on new developments

Organizational aspects

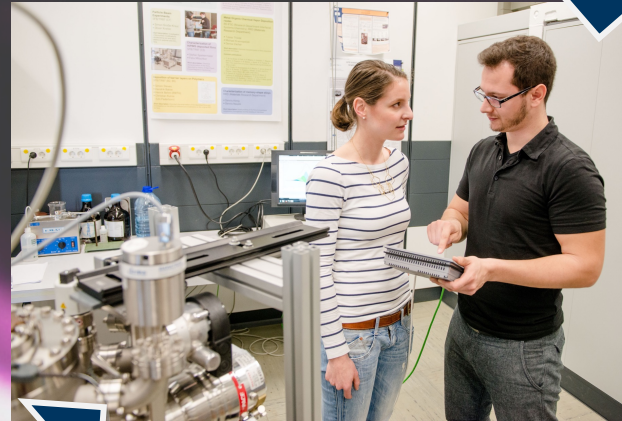
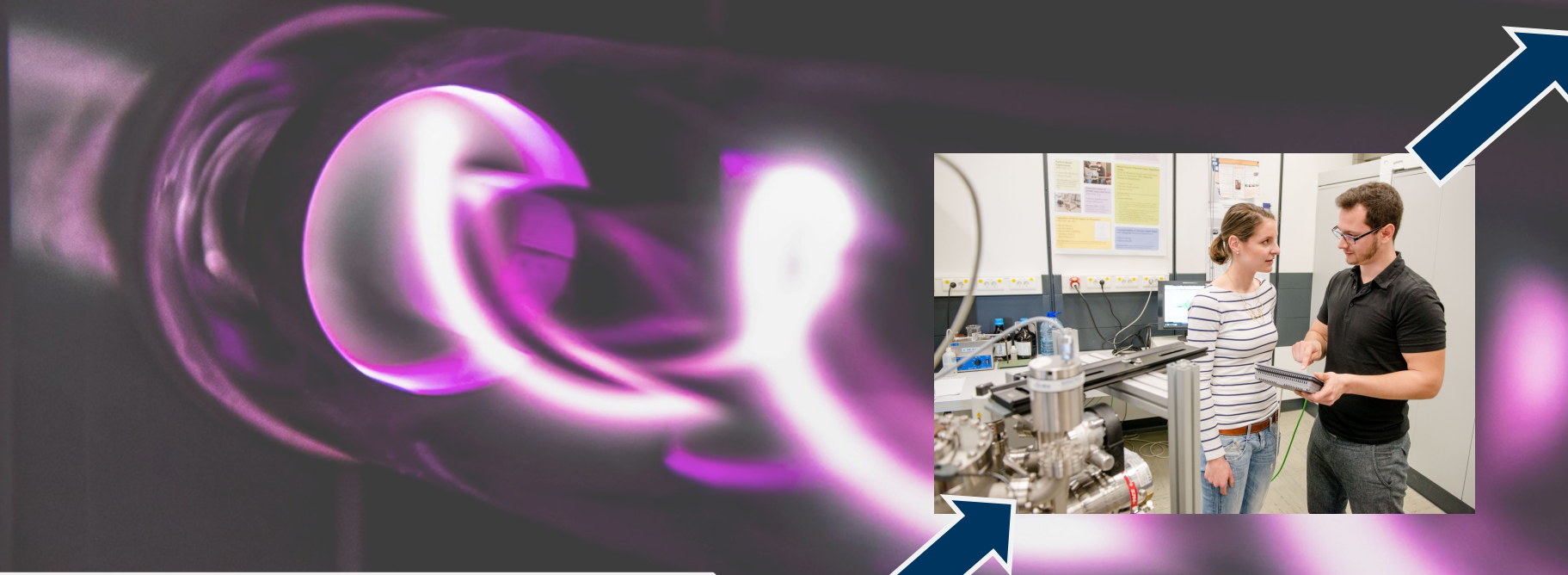
- ✓ All research fields represented
- ✓ Regular meetings
- ✓ Working as multipliers



Measure I: eLabFTW



Metadata standard development QPTDat & CRC 1316



Plasma source

description of name and/or type of the plasma source including application the plasma source is applied for

Plasma medium

medium name the plasma source is operated in or acting on and properties of the medium the plasma source is operated in or acting on

Target

name of the target the plasma source is acting on, either directly or mediated by a medium and properties of the target the plasma source is acting on

every 3rd Friday
in month

Plasma
source

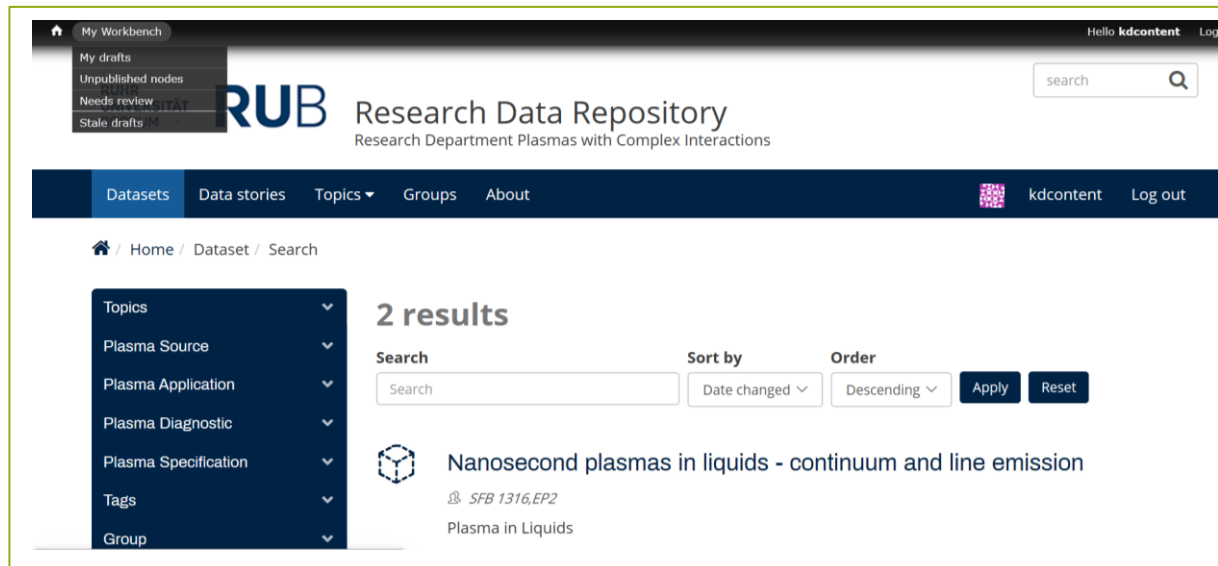
Target

Plasma
medium

Measure II: repository

The rdpcidat repository

- RUB repository location: *rdpcidat.rub.de*
- Publication of data sets from journal article
- The same installation instance runs at INP Greifswald
- Harvesting between *inpd* and *rdpcidat* planned



frontpage

Example for a data set at rdpcidat

2d spatially resolved O atom density profiles in an atmospheric pressure plasma jet: from the active plasma volume to the effluent

 Plasma Medicine

Two-dimensional spatially resolved absolute atomic oxygen densities are measured within an atmospheric pressure micro plasma jet and in its effluent. The plasma is operated in helium with an admixture of 0.5% of oxygen at 13.56 MHz and with a power of 1 W. Absolute atomic oxygen densities are obtained using Two photon Absorption Laser Induced Fluorescence spectroscopy (TALIF). The results are interpreted based on measurements of the electron dynamics by Phase Resolved Optical Emission Spectroscopy (PROES) in combination with a simple model that balances the production of atomic oxygen with its losses due to chemical reactions and diffusion. Within the discharge, the atomic oxygen density builds up with a rise time of 600 μ s along the gas flow and reaches a plateau of $8 \times 10^{15} \text{ cm}^{-3}$. In the effluent, the density decays exponentially with a decay time of 180 μ s (corresponding to a decay length of 3 mm at a gas flow of 1.0 slm). It is found that both, the species formation behavior and the maximum distance between the jet nozzle and substrates for possible oxygen treatments of surfaces can be controlled by adjusting the gas flow.

[COST jet](#) [PROES](#) [absolute atomic oxygen densities](#) [APPJ](#) [atmospheric pressure plasmas](#) [TALIF](#)
[reactive gas](#)

Dataset Info

Field	Value
Publisher	PIP
Authors	D. Steuer I. Korolov S. Chur J. Schulze V. Schulz-von der Gathen J. Golda M. Böke

Release Date	2021-05-06
Identifier	e326f290-7ed9-4fa4-a0d2-1779c8ab625f
Permanent Identifier (URI)	https://rdpcidat.rub.de/node/323
Is supplementing	J. Phys. D: Appl. Phys. 54 355204 (2021)
Plasma Source Name	COST-jet
Plasma Source Application	Diagnostics
Plasma Source Specification	atmospheric pressure AC non-thermal high frequency
Plasma Source Properties	COST-jet, consists of two identical and co-planar parallel electrodes made of stainless steel. The electrode gap is 1 mm. The electrodes are enclosed by two quartz plates confining the plasma volume to $1 \times 1 \times 30 \text{ mm}^3$, the frequency is 13.56 MHz.
Language	English (United States)
Plasma Source Procedure	The gas flow is varied from 0.2 to 1.2 slm. The gas mixture is fixed to helium + 0.5% oxygen. The power is fixed to 1 W.
License	cc-by-40
Plasma Medium Name	He O2
Plasma Medium Properties	The discharge is operated in helium (5.0 purity) with 0.5% oxygen (4.8 purity) admixture. The temperature is roughly room temperature.
Plasma Medium Procedure	The gas flow is varied from 0.2 to 1.2 slm. The gas mixture is fixed to helium + 0.5% oxygen.

Measure III: policy

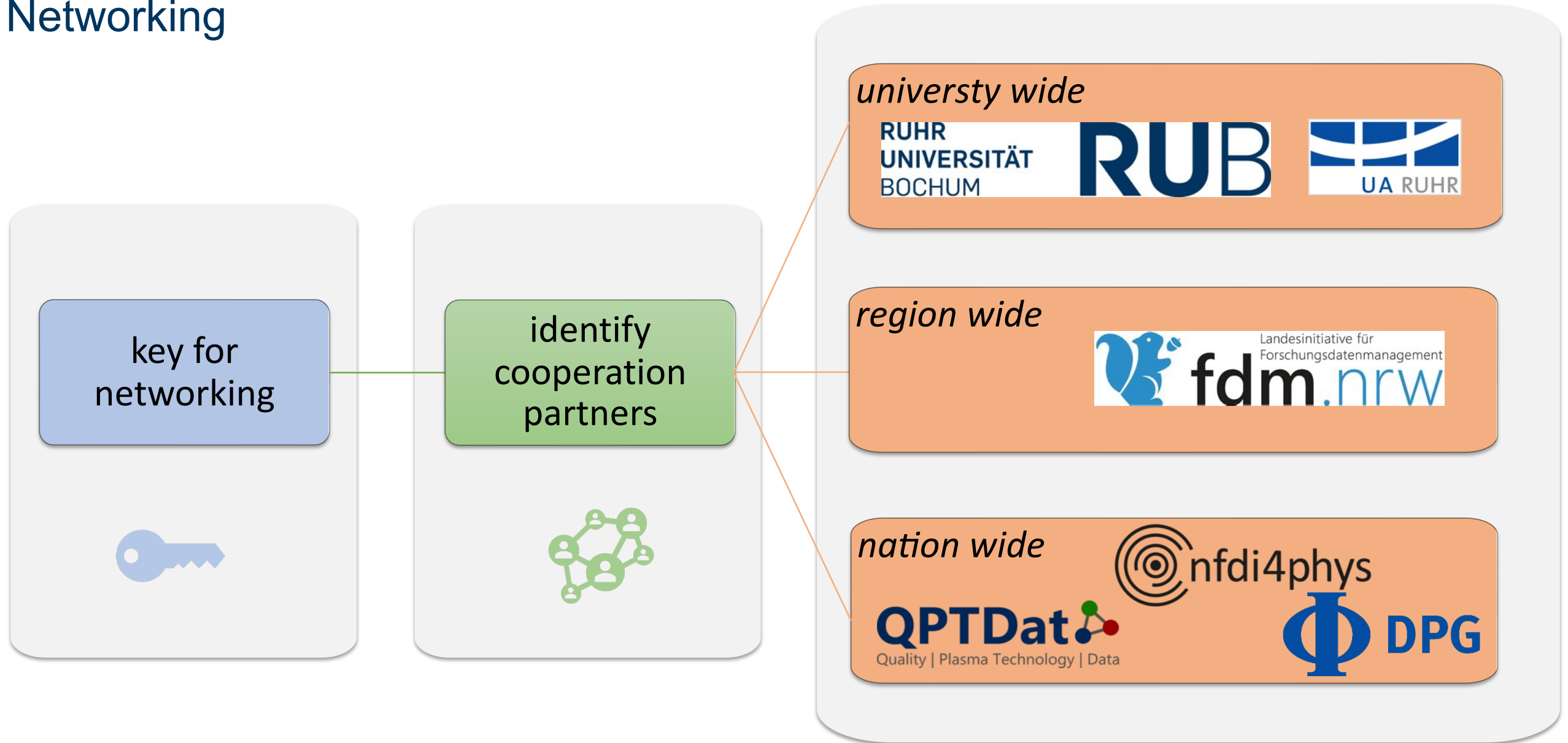
RDM policy

- CRC 1316 RDM policy established in 2020
- FAIR aspects are covered in the RDM policy
- Researchers' commitment to RDM increased
- Increase the importance of RDM for the CRC 1316
- Confirmation by members' meeting
- Principle of data stewards is anchored in it

Research Data Policy of the CRC 1316

1. The research data should be archived and/or published in the long term in a suitable trustworthy data archive or repository. They are part of the scientific output of the researchers.
2. The project leaders and independent researchers are responsible for the research data management of their research projects. In particular, they are obliged to ensure compliance with good scientific practice and professional standards. All persons working on a research project are responsible for the correctness of the data they collect and for compliance with the regulations they have established. Research data management is to be seen as an integral part of the research project. The researchers are responsible for the research data management of their research projects.
3. The members of the research department observe ethical, data protection and copyright or secrecy-worthy interests in research data management. This does not affect the examination of research data in terms of the German Employee Invention Act. When transferring rights of subsequent use or publication, care should be taken to ensure that the data remains freely available for scientific purposes. The protection of personal data, copyright and the legitimate interests of third parties shall remain unaffected. In the event of a transfer of subsequent use or publication rights, care is taken to ensure that the data remain freely available for scientific purposes.
4. The research department promotes and supports free access to research data. It recommends making research data as well as scientific publications publicly accessible as early as possible in accordance with the RUB Open Access Resolution. In the event of a transfer of subsequent use or publication rights, care is taken to ensure that the data remains freely available for scientific purposes. However, researchers are not obliged to make research data available to persons outside the project team prior to processing, evaluation and publication, subject to disclosure to commissions. Contractual agreements also remain unaffected.
5. The CRC 1316 is adapted to the basic research data infrastructure of the Ruhr-Universität Bochum and, thus, ensures appropriate storage and technical availability of digital research data. Digital research data will be stored and archived in the RUB's IT and information infrastructure or in recognized external or internal specialist repositories. External partners may use the RUB IT infrastructure or guarantee to use a similar infrastructure to ensure appropriate storage of digital research data.
6. Research data can be published in the repository of the research department plasmas with complex interactions (RDPCI): rdpcidat.rub.de. Every project leader is granted access to this platform and is supported by the RDPCI staff to publish his or her research data. They are part of the scientific output of the CRC 1316 researchers. This research data should be archived for at least 10 years.
7. The groups of the CRC 1316 appoint a data steward who advises the scientists on entering data and metadata into the repository.
8. The PIs of CRC 1316 commit themselves to follow discipline specific metadata standards.
9. The CRC 1316 participates in the further development of the metadata standards in coordination with the working group of the plasma physics association of the DPG.

Networking



Networking RUB/UA-Ruhr

RUB specific strategy

- coordination by **central RDM team** (university library and IT.Services)
- developing overarching RDM strategy
- supporting networking events
- offering general training concepts (e.g., data management plans)
- guidance concerning repository solutions
- joint development of new or adaptation of existing metadata schemes
- designation of technical needs from the CRC



UA Ruhr Alliance strategy

- building a network to other data managers in UA Ruhr working on similar topics
- exchanges on discipline-specific standards
- exchange of experiences
 - joint development of best practices



Cooperation beyond local structures

- **National Research Data Infrastructure (NFDI)**
 - special interest groups to foster collaboration
 - background knowledge for understanding the NFDI solutions (services, standards, best practices)
 - anchoring knowledge and service locally result in mediators and multipliers
- **German national societies**
 - *German Physical Society*: exchange with scientists about RDM strategies into the community
- **QPTDat**
 - Metadata scheme development plasma physics
 - elabbook invention
- **fdm.nrw**
 - State initiative for research data management in North Rhine-Westphalia
 - Train-the-trainer courses and networking opportunities



Thank you very much for
your kind attention!

Q & A

1. Roughly, which percentage of the people in the CRC really like the activities on RDM?

The project started on 01/01/22 and the challenge of the next years will be to integrate all scientists into the RDM activities. Approximately 75% of all members are already currently actively supporting the INF project activities (RDM). Especially, younger scientist are more very eager to support the project. At the moment, there is more exchange between the INF project and the researchers since the different tools and measures are not yet finalized. Therefore, feedback from the researchers is needed, which means additional work at the moment. However, the exchange between the researchers and the INF project is very fruitful to improve and streamline all measures. In summary, the number of people working on the subject is more than sufficient to guarantee lively project activities. It should be emphasized that almost all new PhD students start with eLabFTW.

2. How hard was it to get funding for this activity?

This is difficult to answer due to limited experience with those projects in the past. The INF (RDM) project leaders of SFB 1316 have already done a lot of preliminary work during the two years before the evaluation to establish a basis within the consortium. In detail, we have already prepared concrete measures to show how we proceed in case of funding. In particular, we highlighted the data stewards (contact persons on the topic of RDM in the various research groups). During the evaluation of the project, one reviewer was assigned to RDM only. The discussion was very detailed and was following the guidelines given by the funding organization. We were able to prepare for these questions and answer them in an appropriate way. Another INF project at the same faculty also applied for RDM funding. The focus of this second project is more on implementing a database without data experts. Here, a high level of support from the RDM group of the local IT services is planned. In summary, the goal of the project must fit into the consortium and address the needs for the generated data. The demands from the funding agency for any RDM activity is intensifying a lot at the moment and, therefore, an application for RDM should be planned very well and in advance.