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FIZnews

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Responsibly shaping digital transformation in research: DiTraRe Symposium 2025

Karlsruhe, December 3, 2025 — When algorithms participate in research: Given the rapid deployment of artificial intelligence in research, the question increasingly arises as to how digital methods can be used in a scientifically sound, ethically reflective, and socially acceptable manner. These questions were also the focus of the DiTraRe Symposium 2025 held at the Center for Art and Media (ZKM) in Karlsruhe.

Interested participants met with researchers from the natural sciences, engineering, law, and the humanities, as well as experts from the fields of infrastructure, ethics, and science management, to discuss the digital transformation of research in an interdisciplinary and transdisciplinary manner. The the program alone made it clear that the challenges surrounding digitization and artificial intelligence cannot be solved within the boundaries of individual disciplines.

Why research needs people

One of the symposium's main topics was the use of artificial intelligence in research and the question of how this use can be made ethical, transparent, and efficient at the same time. The keynote address by Prof. Dr. Mieke Boon (University of Twente) provided the central impetus. In her presentation “Human Research Strategies vs. Research Shaped by Algorithms,” Boon showed that although data-driven AI systems are powerful, scientific knowledge does not arise from correlations alone. Theoretical concepts, modeling, explainability, and

human judgment remain central components of scientific practice. This is precisely why it is crucial to design AI systems in such a way that they enable understanding rather than obscuring it. These questions are highly topical: AI-supported processes are already influencing medical decisions, climate models, and technical risk assessments today.

Digitalization as a cultural transformation

Lectures, panels, and poster sessions at the symposium addressed efficiency gains as well as issues of transparency, traceability, and scientific integrity. This approach is what sets the Leibniz Science Campus apart: DiTraRe does not view digitalization as a technical upgrade, but rather as a profound cultural transformation of research that enables and requires new forms of collaboration. The four use cases from DiTraRe, which were also repeatedly addressed during the symposium, illustrate how this looks in practice using specific examples from current research.

- Protected Data Spaces – secure use of sensitive research data at the interface of technology, law, and ethics.
- Smart Data Acquisition – digital data collection in the laboratory as an interplay of infrastructure, professional practice, and good scientific practice.
- AI-Based Knowledge Realms – explainable AI in biomedical research, supported by technical, medical, and ethical expertise.
- Publication Cultures – new forms of publication for large data sets, for example in climate research, developed jointly by specialist scientists and information scientists.

Research across institutional boundaries

The Leibniz Science Campus “Digital Transformation of Research” is a joint project of FIZ Karlsruhe and the Karlsruhe Institute of Technology (KIT), funded by the Leibniz Association. The starting point was the realization that digitization not only produces new tools, but also fundamentally changes research practices, role perceptions, and evaluation criteria.

As part of the Leibniz Science Campus format, DiTraRe was conceived as an interdisciplinary and cross-institutional collaboration. The aim is to combine technical innovation, theoretical reflection, and social responsibility and to design research in such a way that it remains sustainable in the long term. This is precisely where DiTraRe comes in: by bringing disciplines together at an early stage, criteria for the meaningful use of digital methods can be developed before problematic routines become entrenched. The focus is always on the responsibility of researchers. Especially at a time when AI is increasingly preparing or influencing decisions, it is crucial to consider scientific autonomy, human judgment, and social trust.

This makes it all the more important that the DiTraRe symposium was a success and will inspire further similar formats within the Leibniz Science Campus. Coordinator Dr. Anna Jacyszyn comments: “The Symposium really was a great success. We were able to create such a full program, amazingly diverse for a noon-to-noon conference. Every session had a special atmosphere of its own, thanks to the many disciplines came together for this event. Another highlight was the Poster Session that really added to the variety and liveliness of the Symposium. We are already planning the next DiTraRe event for 2026.”

Learn more about the Leibniz Science Campus ‚Digital Transformation of Research at https://www.ditrare.de/en

The publications of the participating researchers and their use cases are available at https://zenodo.org/communities/ditrare/records?q=&l=list&p=1&s=10&sort=newest

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