DERSE25 KARLSRUHE

Research Software

A Critical Ingredient Across Diverse Funding Models and Disciplines

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about us
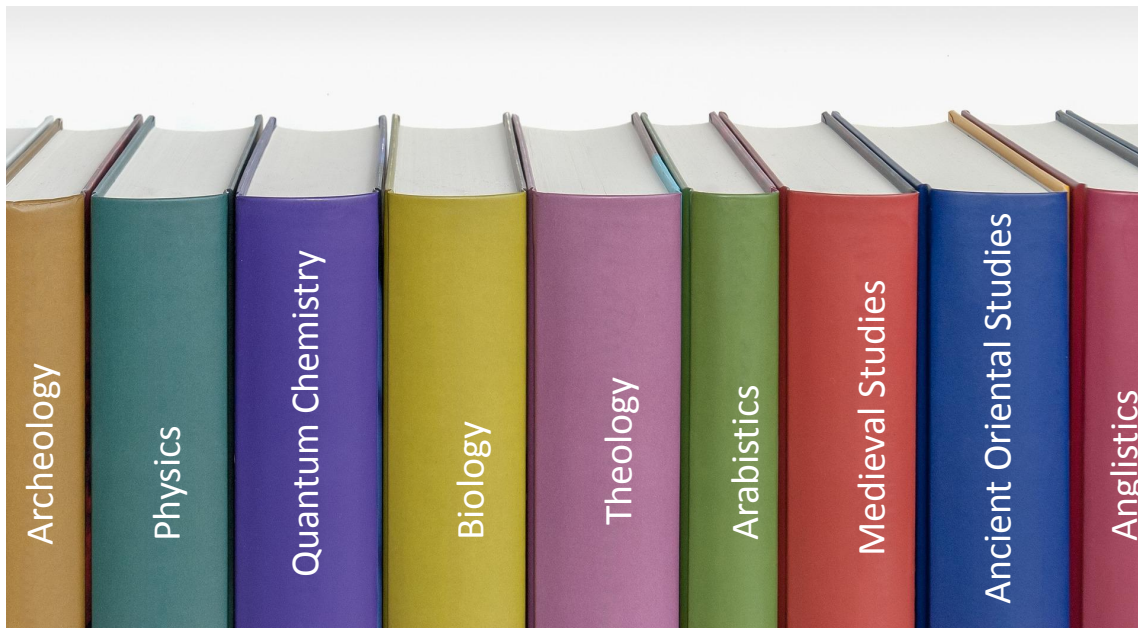
A large [agile team](#) in a [scientific library](#)

We offer [RSE as a service](#)

We are aiming for the right [balance between tailored and generic solutions](#)

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About 30 projects/ cooperations each year

The integration and funding of RSEs within various funding models often is a

Challenge

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Three Funding Models as Case Studies

Research Units (FOR), **Research Training Groups (RTG)**, and **Collaborative Research Centers (CRC)**

Funding Model: Research Unit (FOR)

Aspect	Research Unit (FOR)	Research Training Group (RTG)	Collaborative Research Center (CRC)
Duration	Up to 6 years	Up to 9 years	Up to 12 years
Focus	Specific research topic	Training of doctoral candidates	Long-term, interdisciplinary research
Scope	5–10 projects	10–15 doctoral research projects	10–20 or more subprojects
Goal	Establishment of new research directions	Structured doctoral education	Innovative, complex research projects
Interdisciplinarity	Possible, but not mandatory	Possible, but not mandatory	Strongly interdisciplinary
Structural Formation	Flexible design of the research network	Focus on early-career support	Strong institutional focus
Institutional Integration	Local or regional	Local, at one university	Local or regional (for Transregional CRC)

Research Unit FOR 2064 STRATA -
Stratification Analyses of Mythic Narrative Materials and Texts in Ancient Cultures

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Challenge

RSE outsourced as agency contract with requirements document

FOR STRATA Hyleme Database

Research Unit FOR 2064 STRATA

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Lessons Learned

- Close integration into scientific workflows
- Field-Specific Expertise on standards, tools, and infrastructures
- Sustainable Solutions that are compatible and reusable
- Agile over Waterfall: Flexibility for better outcomes
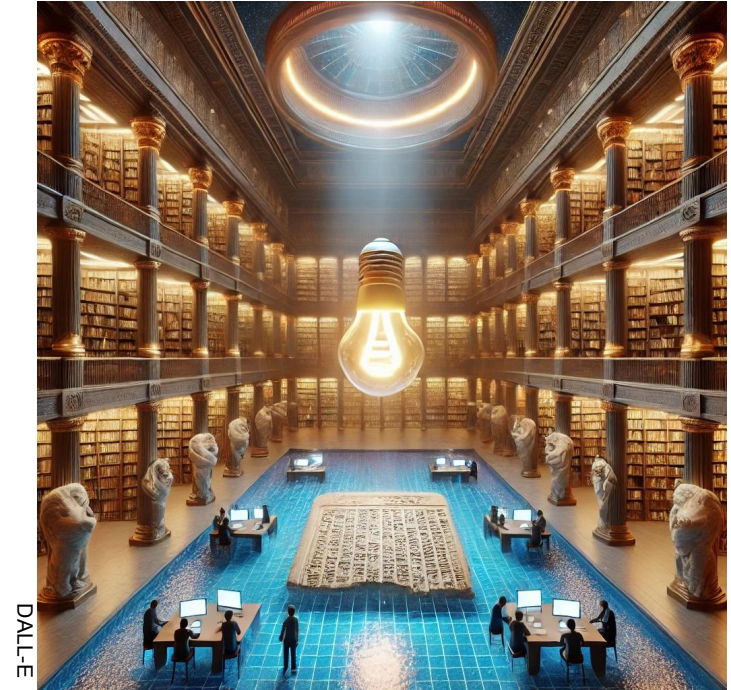
Funding Model: Research Training Group (RTG)

Aspect	Research Unit (FOR)	Research Training Group (RTG)	Collaborative Research Center (CRC)
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Research Training Group: RTG 2455 BENCh -
Benchmark Experiments for Numerical Quantum Chemistry

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Challenge

- Primary focus on doctoral training
- Software development often part of student tasks
- Funding for RSE is only possible if "research infrastructure" is insufficient
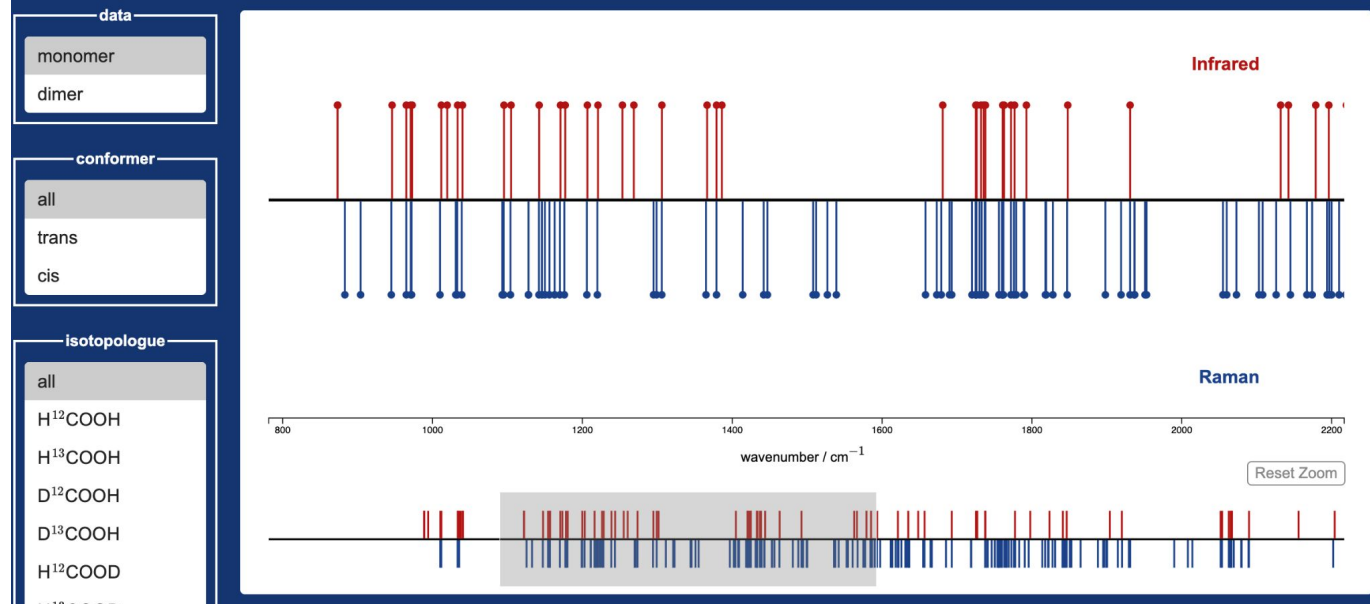- RSE often not included in initial planning

https://qmbench.net/

RTG 2455 BENCh - Benchmark Experiments for Numerical Quantum Chemistry

Lessons Learned

- Dedicated RSE support in RTGs empowers researchers to focus on their core objectives
- Enhanced research quality and efficiency is achieved through professional software support
- Sustainable data management ensures long-term accessibility and usability of research data
- Commitment to reproducibility and FAIR principles strengthens scientific integrity and transparency
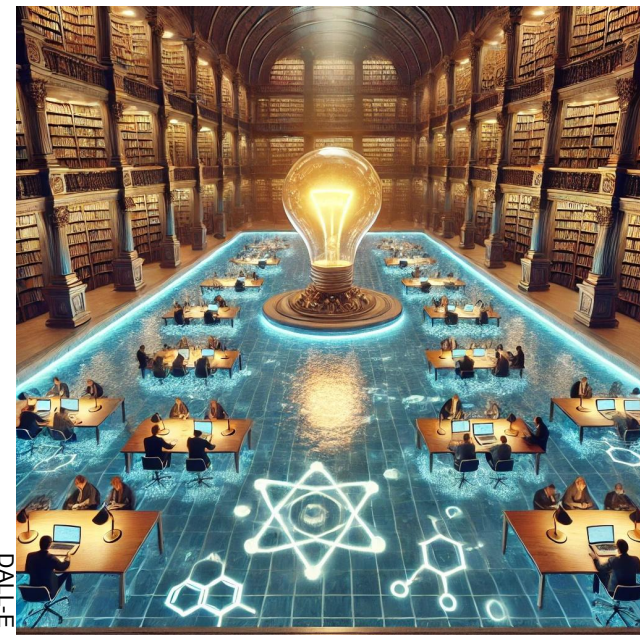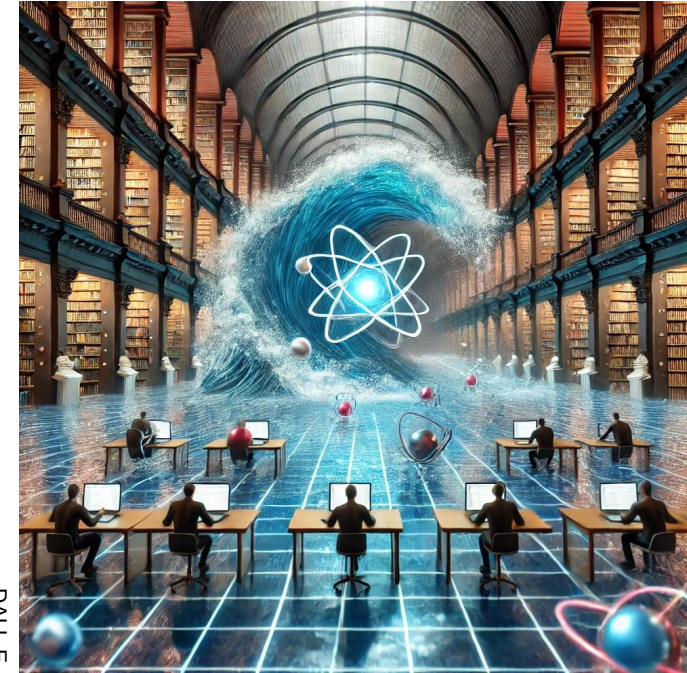
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Funding Model: Collaborative Research Centers (CRC)

Aspect	Research Unit (FOR)	Research Training Group (RTG)	Collaborative Research Center (CRC)
Duration	Up to 6 years	Up to 9 years	Up to 12 years
Focus	Specific research topic	Training of doctoral candidates	Long-term, interdisciplinary research
Scope	5–10 projects	10–15 doctoral research projects	10–20 or more subprojects
Goal	Establishment of new research directions	Structured doctoral education	Innovative, complex research projects
Interdisciplinarity	Possible, but not mandatory	Possible, but not mandatory	Strongly interdisciplinary
Structural Formation	Flexible design of the research network	Focus on early-career support	Strong institutional focus
Institutional Integration	Local or regional	Local, at one university	Local or regional (for Transregional CRC)

Collaborative Research Centers: CRC 1633 -

Pushing Electrons with Protons

Challenge

- Research infrastructure is often not considered in the long term – the focus is on project-specific RSE funding.
- Each discipline had its own research data practices, leading to fragmentation.
- Structural funding for long-term research infrastructure development was not provided

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CRC 1633 - Pushing Electrons with Protons

CRC 1633 - Pushing Electrons with Protons

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Lessons Learned

- Interdisciplinary software integration requires early standardization
- The role of institutional RSE support is critical for sustainability
- FAIR principles require active implementation
- Research software sustainability must extend beyond CRCs
- Research data management (RDM) and research software engeneering needs to be considered at the proposal stage

Summary

Aspect	Research Unit (FOR)	Research Training Group (RTG)	Collaborative Research Center (CRC)
Role of RSEs	Often informal or ad-hoc	PhD candidates develop software as part of their research, often without dedicated RSE support	Can include dedicated RSE positions, but implementation varies
Software Sustainability	Limited—often dependent on individual researchers	Challenging—software development is often tied to PhD projects and may not be maintained long-term	More potential for sustainable software development, but requires structured RSE involvement
Challenges for RSEs	No dedicated funding for RSEs; software often developed as a side task	Lack of formal RSE roles, reliance on temporary contributors (PhDs)	Potential for long-term RSE roles, but recognition and funding are inconsistent

Conclusion & Outlook

Structural Challenge: Lack of sustainable RSE positions leads to inefficiencies and hinders innovation.

Call for Action: Funding agencies should require RSE planning in research proposals and especially in Research Unit, Research Training Group and Collaborative Research Center Programmes.

Awareness Gap: The issue is not just funding—many researchers underestimate the need for structured RSE support.

Agile Over Waterfall: In RSE projects, agile development approaches almost always prove more effective than rigid waterfall models.

RSE-as-a-Service: By offering RSE-aaS, we enable cross-disciplinary synergies by identifying reusable algorithms, data modeling approaches, and methodologies across different research domains.

Long-Term Vision: Establish RSE as a recognized profession and/or service with stable funding.
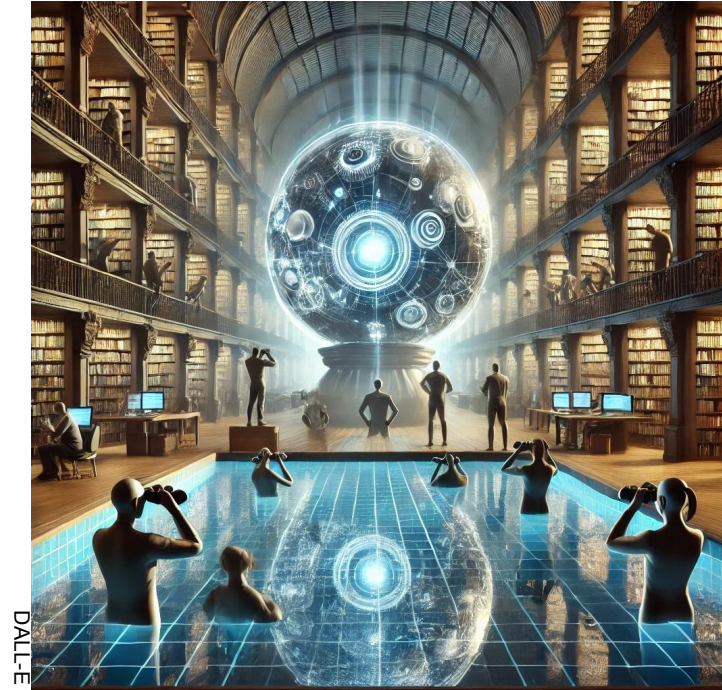
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More from the SUB Development Team

Exploring the TIDO Viewer: A Generic, Interactive, and Research-Driven Solution for Digital Texts and Objects (Poster & Demo)

Paul Pestov, Orlin Malkja,
Feb 26, 2024, 18:00 PM

Strengthening the Traceability and Transparency of the Software Development and Management Lifecycle Using Knowledge Pool (Poster & Demo)

Oguzhan Büyük
Feb 26, 2024 18:00 PM

Infrastructures for a community-developed text processing library (Talk)

Florian Barth, Mathias Göbel, Tillmann Dönicke
 Feb 27, 2024, 10:00 AM

Thank you!

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