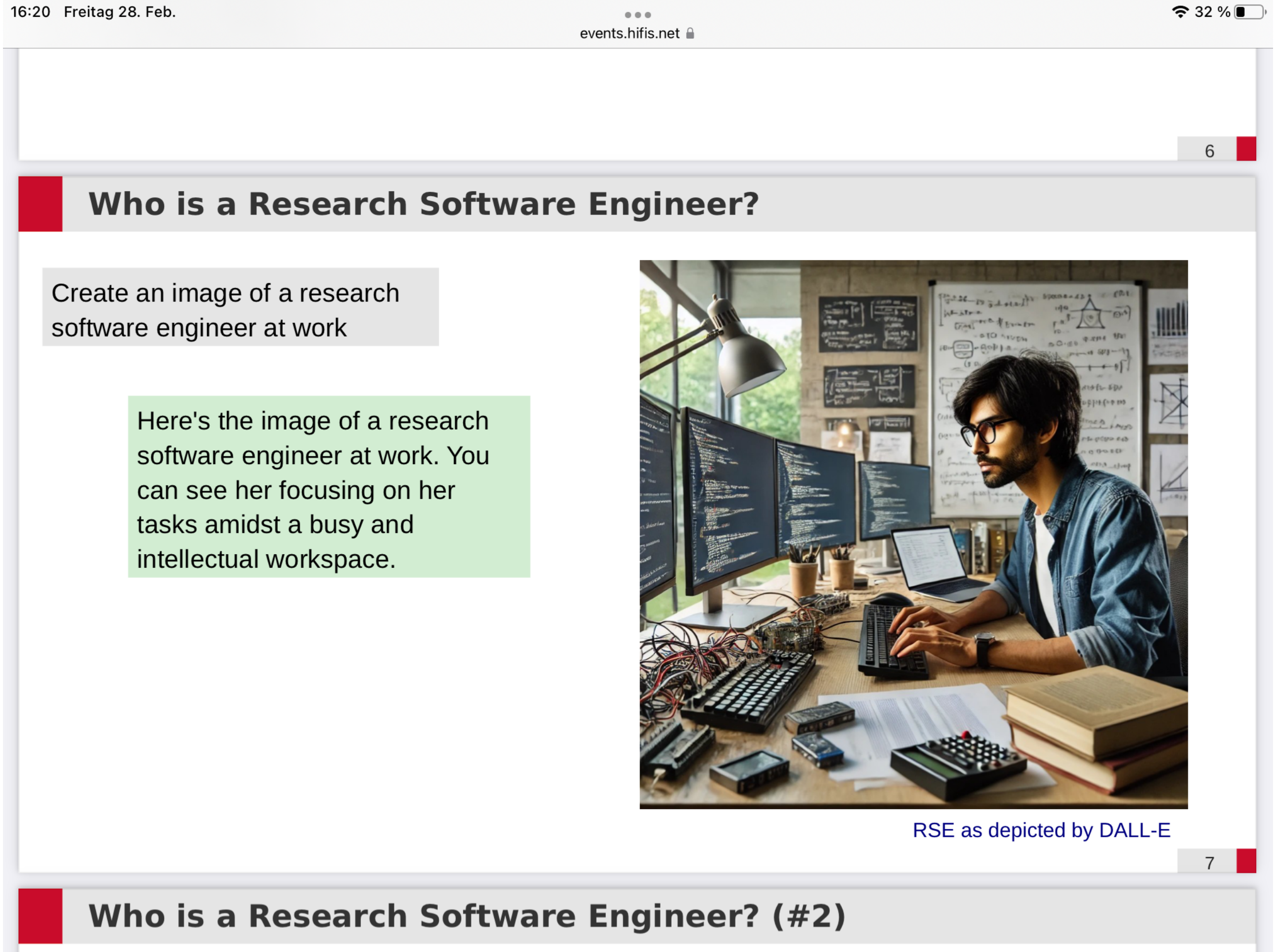
(not so) brief report on deRSE25

From 25th to 27th of February 2025 I attended the 5th Conference on Research Software Engineering in Germany (deRSE25, see https://events.hifis.net/event/2050/). The event took place in Karlsruhe and attracted more that 250 participants. It was held in conjunction with SE25 which had almost 500 attendees (in total with deRSE25).

Unfortunately I missed the first workshops which took place in the morning of the first day, e.g. „HPC Carpentry Community Meetup“ (https://events.hifis.net/event/1741/contributions/13964/attachments/3365/7082/derse_25_-_hpc_carpentry_community_meetup-1.pdf), since I arrived in Karlsruhe at noontime only.

So for me the conference started with the welcome session at 1pm (https://events.hifis.net/event/1741/contributions/15152/attachments/3342/7024/Opening_deRSE25.pdf). As usual some organizational things were mentioned, besides others by the chairman of the conference, René Caspart of KIT. Already here I want to send a big THANK YOU to René and his team: they did a great job, this was the best organized conference I remember. In addition, the chairman of the de-RSE e.V., Jan Linxweiler, introduced his association.

Then the first keynote was given by Dr. Bálint Aradi of the University of Bremen and the Bremen Center for Computational Material Science, it was titled „Research Software and Its Developers: Insights Gained and Future Directions“. It contained a bunch of general remarks, e.g. about who a research software engineer is:



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Who is a Research Software Engineer?

Create an image of a research software engineer at work

Here's the image of a research software engineer at work. You can see her focusing on her tasks amidst a busy and intellectual workspace.

RSE as depicted by DALL-E

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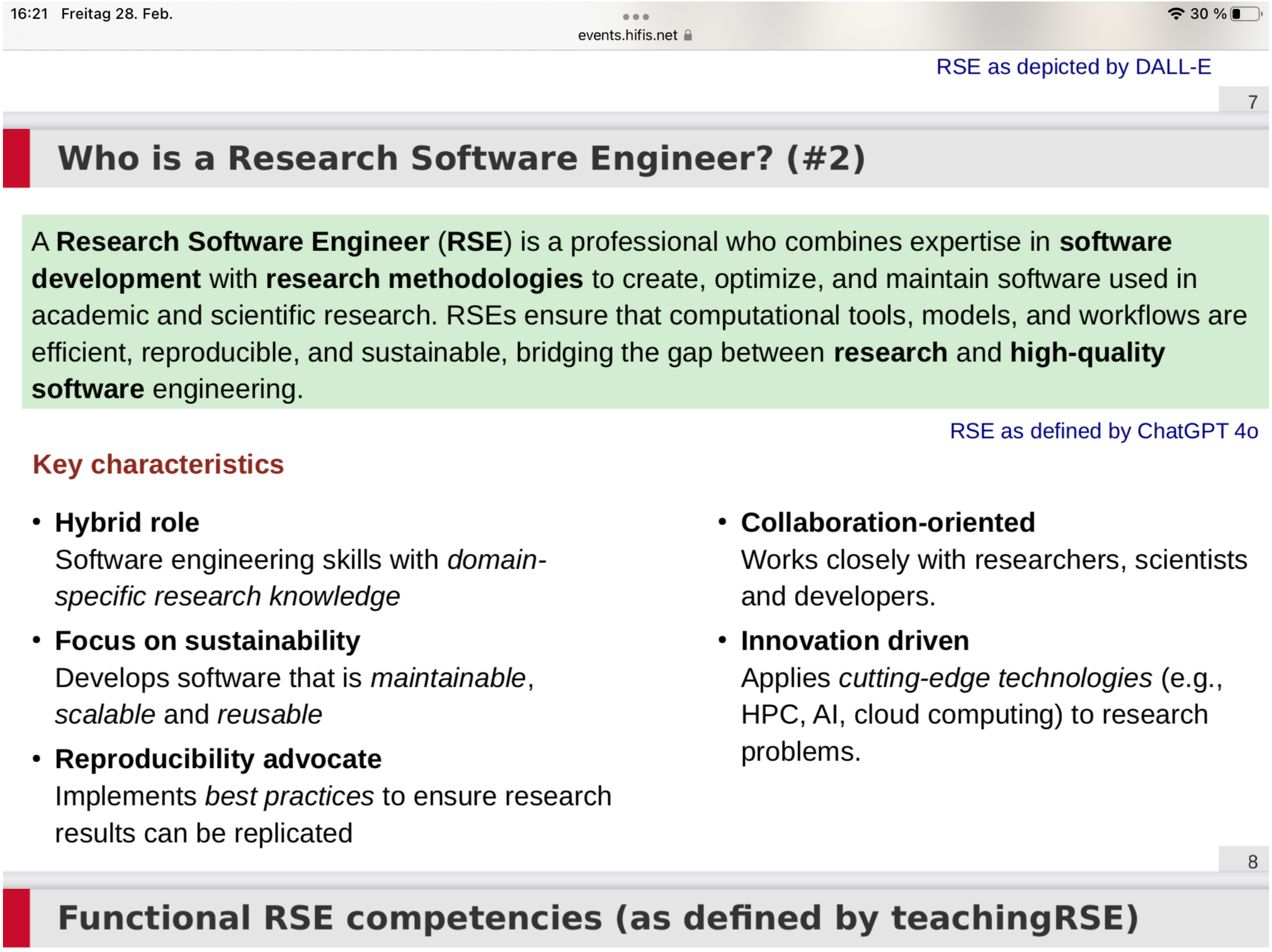
Who is a Research Software Engineer? (#2)



RSE as depicted by DALL-E

Who is a Research Software Engineer? (#2)

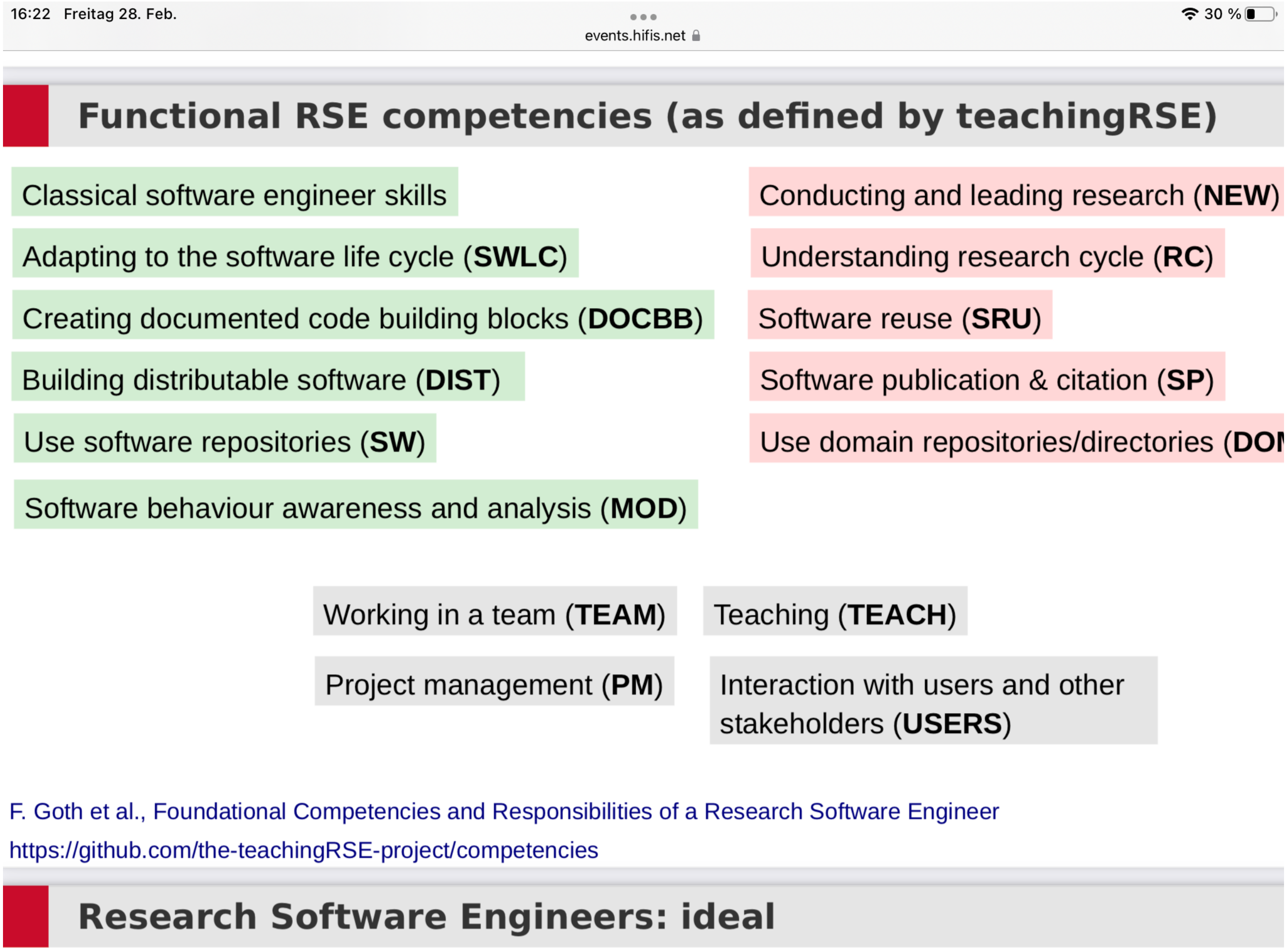
A **Research Software Engineer** (**RSE**) is a professional who combines expertise in **software development** with **research methodologies** to create, optimize, and maintain software used in academic and scientific research. RSEs ensure that computational tools, models, and workflows are efficient, reproducible, and sustainable, bridging the gap between **research** and **high-quality software** engineering.

RSE as defined by ChatGPT 4o

Key characteristics

- **Hybrid role**
  Software engineering skills with *domain-specific research knowledge*
- **Focus on sustainability**
  Develops software that is *maintainable*, *scalable* and *reusable*
- **Reproducibility advocate**
  Implements *best practices* to ensure research results can be replicated
- **Collaboration-oriented**
  Works closely with researchers, scientists and developers.
- **Innovation driven**
  Applies *cutting-edge technologies* (e.g., HPC, AI, cloud computing) to research problems.

Functional RSE competencies (as defined by teachingRSE)



Functional RSE competencies (as defined by teachingRSE)

Classical software engineer skills

Adapting to the software life cycle (**SWLC**)

Creating documented code building blocks (**DOCBB**)

Building distributable software (**DIST**)

Use software repositories (**SW**)

Software behaviour awareness and analysis (**MOD**)

Conducting and leading research (**NEW**)

Understanding research cycle (**RC**)

Software reuse (**SRU**)

Software publication & citation (**SP**)

Use domain repositories/directories (**DOI**

Working in a team (**TEAM**)

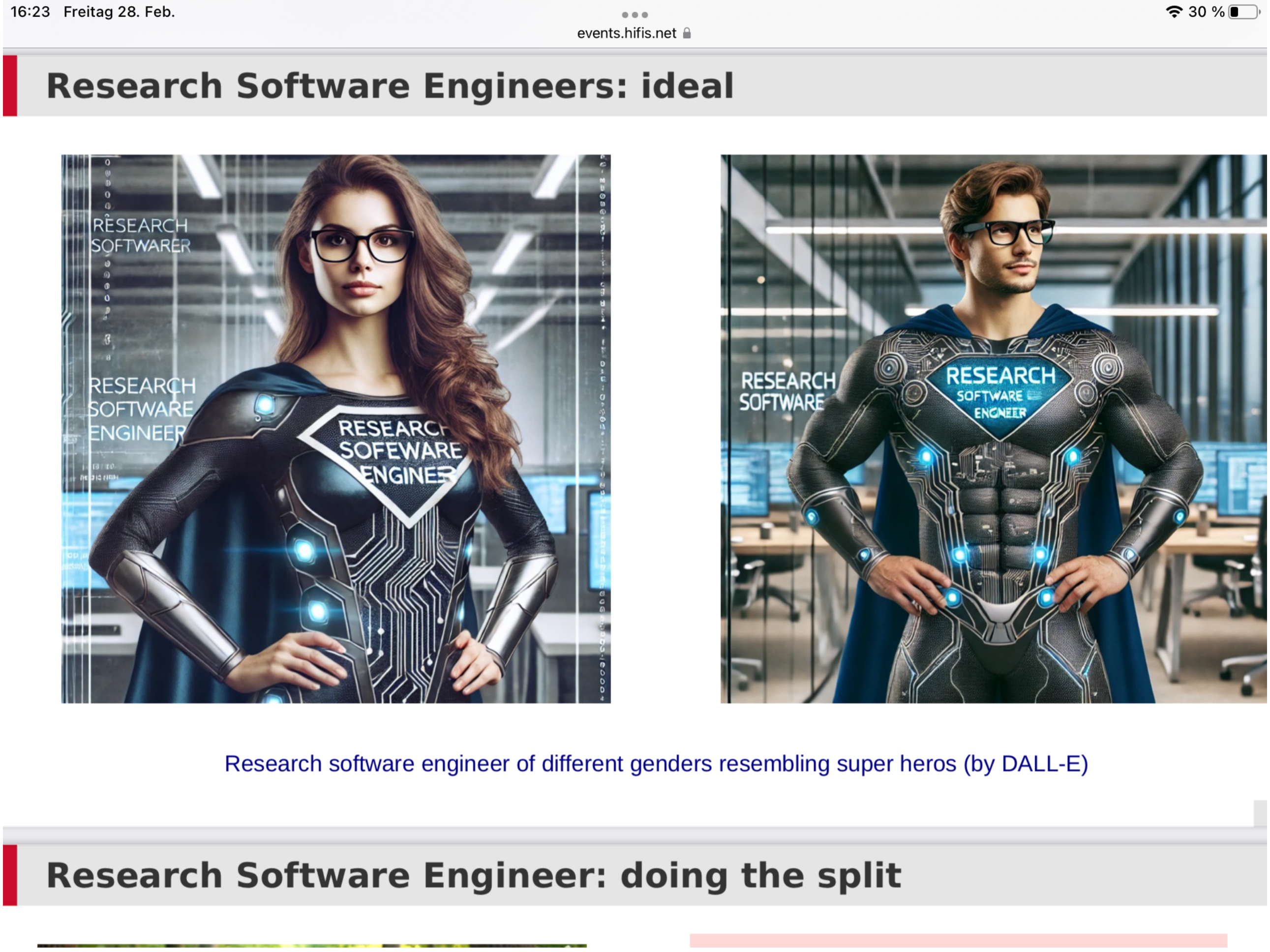
Teaching (**TEACH**)

Project management (**PM**)

Interaction with users and other stakeholders (**USERS**)

F. Goth et al., Foundational Competencies and Responsibilities of a Research Software Engineer
https://github.com/the-teachingRSE-project/competencies

Research Software Engineers: ideal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RESEARCH SOFTWARER
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RESEARCH SOFEWARE ENGINEER
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RESEARCH SOFTWARE ENGNEER

Research Software Engineers: ideal

Research software engineer of different genders resembling super heros (by DALL-E)

Research Software Engineer: doing the split

Interesting, i.e. what I remember, were two points in the presentation:

1. the interdependence of research software engineering and software engineering research [sic!]
2. the revival of Fortran (see the slide set: https://events.hifis.net/event/1741/contributions/12934/attachments/3354/7040/keynote_aradi.pdf)

Although I expected to meet nobody known to me there was one during the first break: Guido Juckeland (ex-TU Dresden, now at FZ Rossendorf, previously the counterpart to KFA Jülich, both nuclear research institutions, in both German states, before the fall of the Berlin Wall). We exchanged some common memories, e.g. T-Platforms bidding at TUDD. I also mentioned that I have been in Rossendorf shortly after the reunification, together with our/Convex‘ man in Eastern Germany, Volker Kisperth, meeting Dr. Kunnicke.

Because we talked that long I was a little late to the session „Facets of large Software Infrastructures“. The subsessions were titled „Advantages and Challenges of a Gitlab CI/CD Pipeline Architecture for the Build and Release System of a Multi-Project Satellite Simulation Software“ (https://events.hifis.net/event/1741/contributions/13380/attachments/3339/7018/deRSE_Advantages_and_Challenges_of_CICD_Pipeline_SuditiChand.pptx), „Software Infrastructure for fully Containerized Computing Cluster at GSI / FAIR“ (https://events.hifis.net/event/1741/contributions/13381/attachments/3335/7014/Kresan-deRSE25.pdf) (FAIR (https://www.gsi.de/forschungbeschleuniger/fair) is a particle accelerator being build near Darmstadt, at GSI they discovered one of the heaviest elements, the Darmstadtium) and „Three Lessons Learned: How RSEs Succeed in License Management“ (https://events.hifis.net/event/1741/contributions/13382/attachments/3329/7008/2025_02_25_%20presentation%20Three%20lessons%20learned.pdf).

The next session I attended was on „Domain Specific Languages“. The talks in this session were titled „Test-Driven Software Experimentation with LASSO“, „SUS: A new language for efficient Hardware Design“ (https://events.hifis.net/event/1741/contributions/13340/attachments/3348/7034/deRSE25%20presentation.pptx) and „OpenLB : On the Software Architecture of an Efficient and Flexible Lattice Boltzmann Method Framework“.

The last session I attended the first day was on „Julia - The Language“. The taks in this sessions were titled „Automatic Differentiation in Julia with Enzyme“ and „BinaryBuilder.jl - Robust

deployment of binaries to the world" (https://events.hifis.net/event/1741/contributions/13303/attachments/3356/7042/BinaryBuilder-deRSE25-Christ.pdf).
In the evening the conference dinner took place at the Quadro Hotel. At the table, I mainly talked to guy from India. He is a quantum software engineer at the FZ Jülich. He tried to explain to me some points of quantum computing I still do not understand ;-). Obviously he is very skeptical about the success of QC. Hence I asked him why he is then working in this field. He answered: well, I get money for it… 🤔
The second day started with the joint (between SE25 and deRSE25) keynote „Innovating at the Intersection: Software Engineering for Science and Industry" by Michael Felderer of DLR. Again he mentioned the interdependence between research software engineering and software engineering research.
After the coffee break during which a group photo was taken (find me in this „Wimmelbild"! ;-):

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I attended the session on LLMs in RSE. The talks were titled „MLentory: A Machine Learning model registry with natural language queries" (https://events.hifis.net/event/1741/contributions/13400/attachments/3384/7089/MLentory%20SWE%202025.pdf), „LLMs for Enhanced Code Review" (https://events.hifis.net/event/1741/contributions/13401/attachments/3361/7049/GSI_Rybalchenko_deRSE25.pdf) and „Helmholtz Blablador: An Inference Server for Scientific Large Language Models" (https://strube1.pages.jsc.fz-juelich.de/2025-02-talk-blablador-derse-kit/#/title-slide).
After that I was very tired, so I skipped the session „Open Source Community Building" which I originally planned to attend. I also left out the poster session and the reception, went to bed very early that day.
Nevertheless I slept long the following morning, skipped the first session of the third and last day of deRSE25. Originally I planned to attend the session „Research Software Metadata and FAIR Assessment". Btw: I knew the FAIR principles (findable, accessible, interoperable, reusable) only in the context of data management but they obviously also apply for (research) software.
The final session I attended was on „Legacy Software Engineering". The talks were titled „Conserving Legacy Code: From handwritten Makefile to modern build system and activatable archivation" (https://events.hifis.net/event/1741/contributions/13954/attachments/3416/7140/Thiele_Conserving_legacy_code.pdf), „Recovering Knowledge from old Code" (https://events.hifis.net/event/1741/contributions/13955/attachments/3385/7090/deRSE25-erxleben-knowledge.pdf), „10 years of rio and readODS: Maintaining an I/O infrastructure of R" (https://

chainsawriot.codeberg.page/karlsruhe_derse2025/#/title-slide) and „Developing a modern build system for the earth system modelling framework MESSy“ (https://events.hifis.net/event/1741/contributions/13957/attachments/3419/7143/003_Talk.pptx). Especially the first talk was interesting to me since it was on TESCA, an EDA code developed in the former GDR. Believe it or not: this code is still in use at various customer sites. The talk was given by a guy from WIAS (Weiherstrass Institute for Applied Analysis and Stochastics. Again, this reminded me of the time shortly after the fall of the Wall: I have been to WIAS with Volker Kisperth.

The official end of the conference was then the farewell and outlook session (https://events.hifis.net/event/1741/contributions/13971/attachments/3423/7161/Closing.pdf).

But after lunch (I could keep my usual veggie Thursday : chickpea curry was served ;-) I finally attended a workshop: „Performance portability and high-performance computing with Julia“ (https://github.com/JuliaHPC/deRSE25-workshop, https://pad.gwdg.de/tSgPV4pdReablNt_Yg9dbQ) but left during the break because I had to catch my train.

In summary: it was worth spending 250€ and three days.

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