

FH Scientific Computing Platform

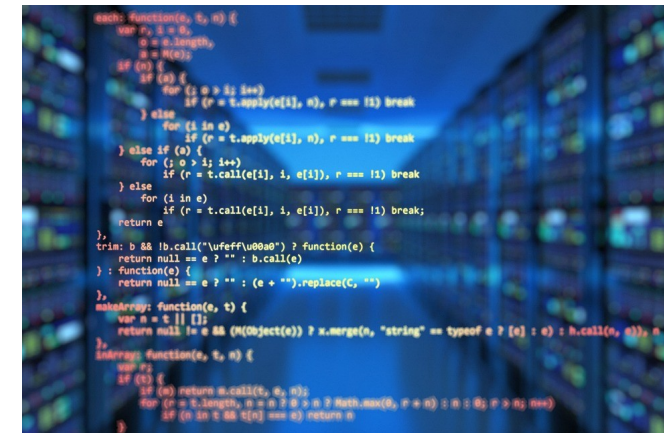
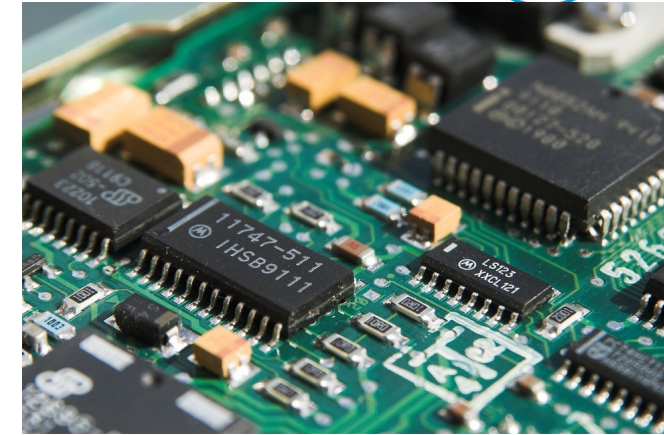
FH Scientific Computing Workshop, 1&2 July 2024

Frank Gaede, Jürgen Reuter, Christoph Wissing (initial platform coordinators)

Scientific Computing

Enabling fundamental research

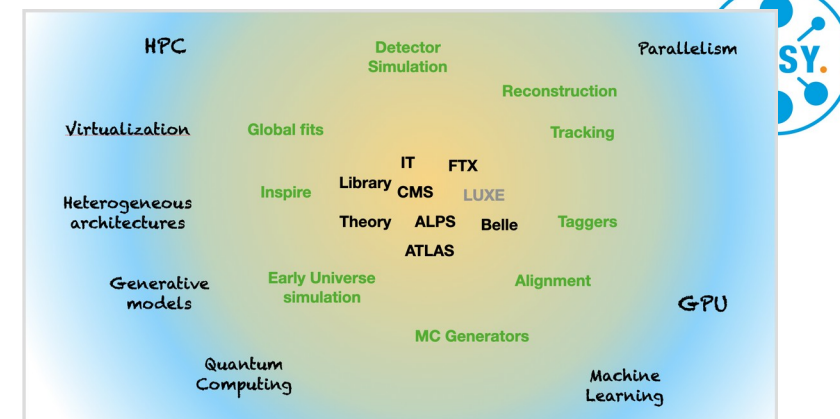
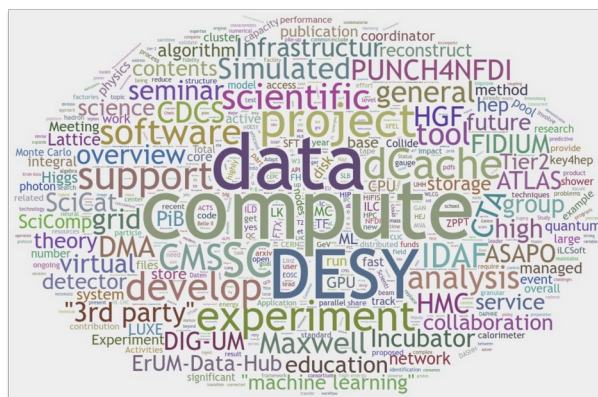
- Particle physics research employs custom instruments and methods
- Computing and software are everywhere – Examples:
 - Detector front end electronics
 - Highly specialised firmware & control software
 - Reconstruction & calibration codes
 - Physics in computer programs
 - MC generators
 - Detector simulation
 - Processing frameworks and data management for distributed computing
 - Statistical and AI & ML tools for data analysis
- Better computing and clever software enhance the scientific harvest and help lowering the required energy footprint



Short History

From a Task Force to a Platform

- In 2022 a task force on Scientific Computing was working on possible improvements
- Basic findings:
 - Increase synergies and collaboration
 - Need of a horizontal structure
 - Need inter-group projects in pressing topics
- Establish an FH wide platform on Scientific Computing



Charge of the Task Force

- Review the current situation and make suggestions on how to **further develop** this important area within FH, e.g.
 - algorithmic developments, research software developments, data management, and novel technologies such artificial intelligence, machine learning and quantum computing
- Propose *strategies* how to
 - increase **DESY's visibility** in the wider HEP community
 - strengthen DESY's role as **research hub for the German universities**
 - advance **career opportunities** for young researchers
 - contribute to more **sustainable computing**

Initial Ideas / Current Thoughts

- Creation of a *Virtual Scientific Computing Group* in FH
- Regular meetings to discuss and prepare 3rd party funding opportunities
- Identify and Work on projects with common strategic relevance, e.g.
 - Exploiting heterogeneous resources
 - (Generative) Machine Learning
 - Quantum Computing
 - Large Scale FAIR Data Management
- Organisation of a regular Scientific Computing Seminar in FH
- Organisation of HEP specific training events
- Serves as Communication Hub to DESY wide Scientific Computing Group

from poster shown at FH-Retreat 2022

Steering Group

Of the Scientific Computing Platform



Frank Gaede (FTX)



Jürgen Reuter (TH)



Christoph Wissing (CMS)



Hubert Simma (TH)



Judith Katzy (ATLAS)



Kerstin Boras (CMS)

Focus topics and interests:

Seminar (Juliette, Frank)

Heterogeneous computing (Philipp, Christoph, Hubert, David)

(Generative) Machine Learning (Frank, Judith, Jürgen)

Fair data management (Tim, Thomas, Hubert)

Research software engineering (Jürgen, Frank)

Quantum computing (Kerstin, Hubert)

DAQ, Trigger & Online (Juliette, Christoph)

Collaborative Tools (Andreas, Tim, David)

Steering group started meeting bi-weekly



Juliette Alimena (CMS)



David South (ATLAS)



Thomas Schörner (CMS)



Andreas Gellrich (Belle-2)



Philipp Neumann (IT)



Tim Wetzel (IT)

Horizontal scientific computing platform in FH

Strengthening scientific computing across groups

- ensure the **long term commitment** to improve the situation for this important field for the (HEP) research at DESY
 - ensure **continuous and stimulating exchange**
 - improve **career opportunities** for younger scientists
 - increase DESY's **visibility** in the field
- Coordination of (common) projects

Initial Ideas / Current Thoughts

- Creation of a *Virtual Scientific Computing Group* in FH
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 - Exploiting heterogeneous resources
 - (Generative) Machine Learning
 - Quantum Computing
 - Large Scale FAIR Data Management
- Organisation of a regular FH Scientific Computing Seminar
- Organisation of HEP specific training events
- Inform about and promote *citable* software releases
- Serves as communication hub to DESY-wide Scientific Computing Group

the transverse scientific computing platform as presented - and discussed - at the FH retreat

Strategies for continuous and stimulating exchange

between the FH groups and beyond

- the horizontal scientific computing platform - once established successfully - will naturally ensure a continuous exchange of information
- Organisation of a **regular scientific computing seminar**:
 - together with the seminar task force the following is about to be implemented:
 - **Regular - in person/hybrid** - meetings with dedicated talks on scientific computing
 - primarily internal speakers and occasionally external invited speakers
 - main goals: **education and networking** opportunities
 - Presently planned:
Common slot with FH physics discussions, pizza seminar & detector platform (alternating)
 - Scouting for contributions today & tomorrow
- in the longer run this can be extended with additional seminars, **workshops or tutorials** as needed
 - need to ensure uniqueness and avoid overlap with the many existing seminar series that people can attend (virtually)

FH Workshop on Scientific Computing

Some Logistics

- Common session with Future Collider workshop
- No topical grouping of talks
 - Avoid selected attendance
 - Full spectrum
- It is all about networking
- Evening reception
 - Get to know each other
 - Informal chats
- Collection of topics & interest
 - Fill [this template](#)
(perhaps also on behalf of other not attending)
 - Name, group, topic(s)



This is what AI thinks a SciComp workshop at DESY looks like

Summary

And Further Information

- FH groups are involved in many important projects and activities in scientific computing
 - yet there is clearly the need to further strengthen this increasingly important field
- a **transverse platform for scientific computing** has started. It will address efforts to
 - **identify and foster synergies between the groups and divisions**
 - **strengthen DESY's role as research hub for the German universities**
 - **increase DESY's visibility in the wider HEP community**
 - **advance career opportunities for young researchers**
 - **contribute to more sustainable computing**
- Further information: Still developing [Xwiki page](#)
- Platform mailing list: fh-scicomp@desy.de (open to subscribe) – rather low traffic (as of now)