

Education and Training

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SuperMUC-NG Status and Results Workshop, 8 – 10 June 2021

- Education and Training @ LRZ
- LRZ as a PRACE Training Centre (PTC)
- LRZ as a German National Competence Centre (NCC) within EuroCC
- Education and Training by the Gauss Centre for Supercomputing (GCS)
- NVIDIA Deep Learning Institute (DLI) Workshops by LRZ
- Challenges moving from Onsite Courses to Online Courses
- Statistics
- Upcoming Courses and Workshops

Education and Training



- Reorganisation of course offerings and organisation since 2021.
- New service name: „Education and Training“.
- Goal: structured uniform course programme on topics such as Application Software, Data Analytics, Deep Learning and AI, HPC, Optimisation, Programming Languages, Quantum Computing.
- New booking system: Edoobox.
- Partly introduction of course fees.

The screenshot shows the 'Education and Training' page on the LRZ website. At the top, there is a search bar and a 'Sign in' link. Below the LRZ logo and the text 'Leibniz Supercomputing Centre of the Bavarian Academy of Sciences and Humanities', the page title 'Education and Training' is displayed. A navigation menu includes 'All offers' (selected), 'Online Courses' (9), 'Onsite Courses' (0), and 'SuperMUC-NG Workshops' (1). A status bar indicates registration status: 'Open for registration' (checked), 'Implementation confirmed' (checked), 'Fully booked / Deadline expired / Registration elsewhere or not started yet' (unchecked). A breadcrumb trail shows categories: 'CFD / Data Analytics / Deep Learning and AI / HPC / LRZ Systems / Optimisation / Programming Languages / GPU'. A table of offers is shown below, with columns for 'Offers', 'Date', 'Place', 'Price', 'Places available', and 'Status'. The 'SuperMUC-NG Status and Results Workshop' row has a 'Register now' button. Callouts highlight 'Tags for Filtering' (pointing to the breadcrumb trail), 'Event Categories' (pointing to the navigation menu), and 'Free Places' (pointing to the '134' in the 'Places available' column).

Offers	Date	Place	Price	Places available	Status
Accelerated Computing with OpenACC and Deep Learning (register via VSC)	27.04.2021 – 29.04.2021		0.00 €	65	⊘
Introduction to C++	03.05.2021 – 06.05.2021	ONLINE	35.00 € – 780.00 €	48	⊘
Introduction to LRZ HPC Systems with Focus on CFD Workflows	31.05.2021 – 31.05.2021	ONLINE	0.00 €	47	⊘
SuperMUC-NG Status and Results Workshop	08.06.2021 – 10.06.2021	ONLINE	0.00 €	134	✓ Register now
VI-HPS Tuning Workshop (register via PRACE)	14.06.2021 – 18.06.2021	ONLINE	0.00 €	35	⊘

Collaborations in Education and Training



PRACE Training Centres



LRZ as part of the Gauss Centre for Supercomputing (GCS) belongs to the 14 **PRACE Training Centres** that started in 2012-2017-2020:

- Barcelona Supercomputing Center (Spain)
- CINECA Consorzio Interuniversitario (Italy)
- CSC – IT Center for Science Ltd (Finland)
- EPCC at the University of Edinburgh (UK)
- Gauss Centre for Supercomputing (Germany)
- Maison de la Simulation (France)
- GRNET – Greek Research and Technology Network (Greece)
- ICHEC – Irish Centre for High-End Computing (Ireland)
- IT4I – National Supercomputing Center VSB Technical University of Ostrava (Czech Republic)
- SURFsara (The Netherlands)
- TU Wien – VSC Research Center (Austria)
- University ANTWERPEN – VSC & CÉCI (Belgium)
- University of Ljubljana – HPC Center Slovenia (Slovenia)
- Swedish National Infrastructure for Computing (SNIC) (Sweden)



Mission: Serve as **European hubs and key drivers of advanced high-quality training** for researchers working in the computational sciences.

<http://www.training.prace-ri.eu/>

Courses and Schools

- PRACE Training Centres
- Seasonal Schools
- Int. HPC Summer School
- On-demand Events



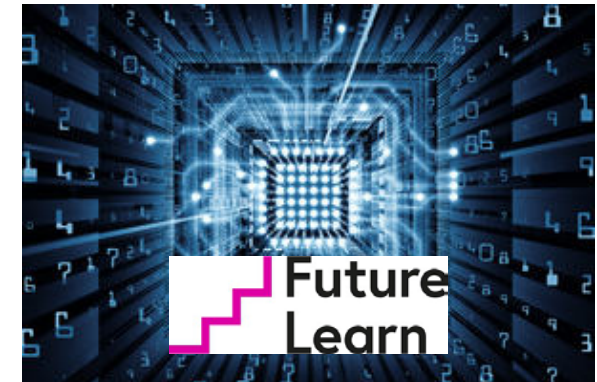
Summer of HPC

- Training & Placement at a HPC Centre



(Massive) Online Training

- MOOCs
- Training Portal
- CodeVault



Regular PRACE Courses @ LRZ



- **VI-HPS Tuning Workshop**
5-days, ~12 VI-HPS lecturers (June)
- **Deep Learning and GPU Programming Workshop**
4 days, 3 LRZ NVIDIA certified lecturers, in collaboration with NVIDIA Deep Learning Institute (DLI) (Jul)
- **HPC Code Optimisation Workshop**
3 days, 3 LRZ + Intel lecturers (tba)
- **Advanced Fortran Topics**
4 days, 3 LRZ lecturers (Nov)
- **Node-Level Performance Engineering**
2-3 days, 2 NHR@FAU lecturers (Dec)
- **OpenMP Programming Workshop**
3-days, 2 members of the OpenMP ARB (Feb)
- **Introduction to hybrid programming in HPC**
3-days, 1 HLRS & 1 NHR@FAU & 2 VSC lecturers (Apr)



EuroCC – German National Competence Centre (NCC)



One of 33 national
competence centres

Financed by EuroHPC
JU (50%) und BMBF
(50%)

Run-time:
01.09.2020 -
31.08.2022

German Partners:
HLRS, JSC, LRZ,
SICOS BW GmbH

Tasks of the NCC are diverse, including (but not limited to):

- **Collect and extend HPC training offers in Germany** and display them on a central place together with international training offers collected by other NCCs.
- Develop and display a comprehensive and transparent **map of HPC, Big Data and AI competences in Germany.**
- Act as a **gateway for industry and academia to providers** with suitable expertise or relevant projects, may that be national or international.
- Foster the **industrial uptake of HPC.**

- The main **mission** for GCS is fostering scientific discovery through use of high-performance computing (HPC) and the sustained development of computer-aided scientific research in Germany and Europe. This is achieved by **providing HPC expertise, services, training and support, as well as state-of-the art HPC resources.**

- HPC-Trainings by GCS (2010-2020)
 - 704 courses
 - 1.947 course days
 - 18.492 participants
 - 52.616 participant days

<http://www.gauss-centre.eu/training>



- **HPC and Parallel Programming**
 - Parallel Programming of High Performance Systems (1 week, in cooperation with NHR@FAU)
 - Compact Course: Iterative Linear Solvers and Parallelization (1 week, by R. Rabenseifner (HLRS) and A. Meister (Uni Kassel))
 - GPU and FPGA Programming
- **Data Analytics, Machine Learning and AI**
 - Data Analytics, Big Data & AI Training Week (1 week, twice a year, in cooperation with TUM Data Innovation Lab)
 - Intel AI Workshops (1 day)
- **Programming Languages**
 - Introduction to C++ (4 days)
 - C for Beginners (3 days)
 - Modern C++ Software Design (3 days, by Klaus Iglberger)
 - Programming with Fortran (3 days)
 - Python (1 day) and other programming languages like Kokkos, Julia, OpenCL
- **CFD / Community-targeted**
 - Introduction to LRZ HPC Systems with Focus on CFD Workflows (1/2 day)
 - Introduction to ANSYS Fluid Dynamics on LRZ HPC Systems (1 week / 20 days weekly)
 - Molecular Modelling with Schrödinger-Suite Workshop (2 days)



- The **NVIDIA Deep Learning Institute (DLI) @ LRZ** offers hands-on training for developers, data scientists, and researchers looking to solve challenging problems with deep learning.
- **Topics:**
 - Fundamentals of Deep Learning
 - Building Transformer-Based Natural Language Processing Applications
 - Fundamentals of Deep Learning for Multi-GPUs
 - Fundamentals of Accelerated Computing with CUDA C/C++
 - Accelerating CUDA C++ Applications with Multiple GPUs
 - Fundamentals of Accelerated Computing with OpenACC
- NVIDIA Certified **University Ambassadors @ LRZ:**
 - Dr. Momme Allalen, PD Dr. Juan Durillo Barrionuevo, Dr. Volker Weinberg
- LRZ lecturers also offer DLI training @ CSC, HLRS, ISC, IT4Innovations, VSC

GCS Newsflash: During Pandemic-Related Remote Working, GCS Centres Embrace Expanding E-Learning Offerings



GCS
Gauss Centre for Supercomputing

Searchterm Search

FOR USERS RESULTS TRAININGS/WORKSHOPS NEWS DISCOVER GCS CONTACT

HOME | NEWS | NEWSFLASHES | DURING PANDEMIC-RELATED REMOTE WORKING, GCS CENTRES EMBRACE EXPANDING E-LEARNING OFFERINGS

NEWSFLASHES

During Pandemic-Related Remote Working, GCS Centres Embrace Expanding E-Learning Offerings

Newsflash 11/2020 – September 21, 2020

Despite having had only modest plans for online training courses in 2020, COVID-19 demanded that GCS centres' training staffs evolve to ensure the organization delivered on one of its core missions—training scientists to make the best use of HPC resources.

NEWSFLASHES
PRESS RELEASES
RESEARCH HIGHLIGHTS
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MEDIA CONTACT
Eric Gedenk
Regina Weigand

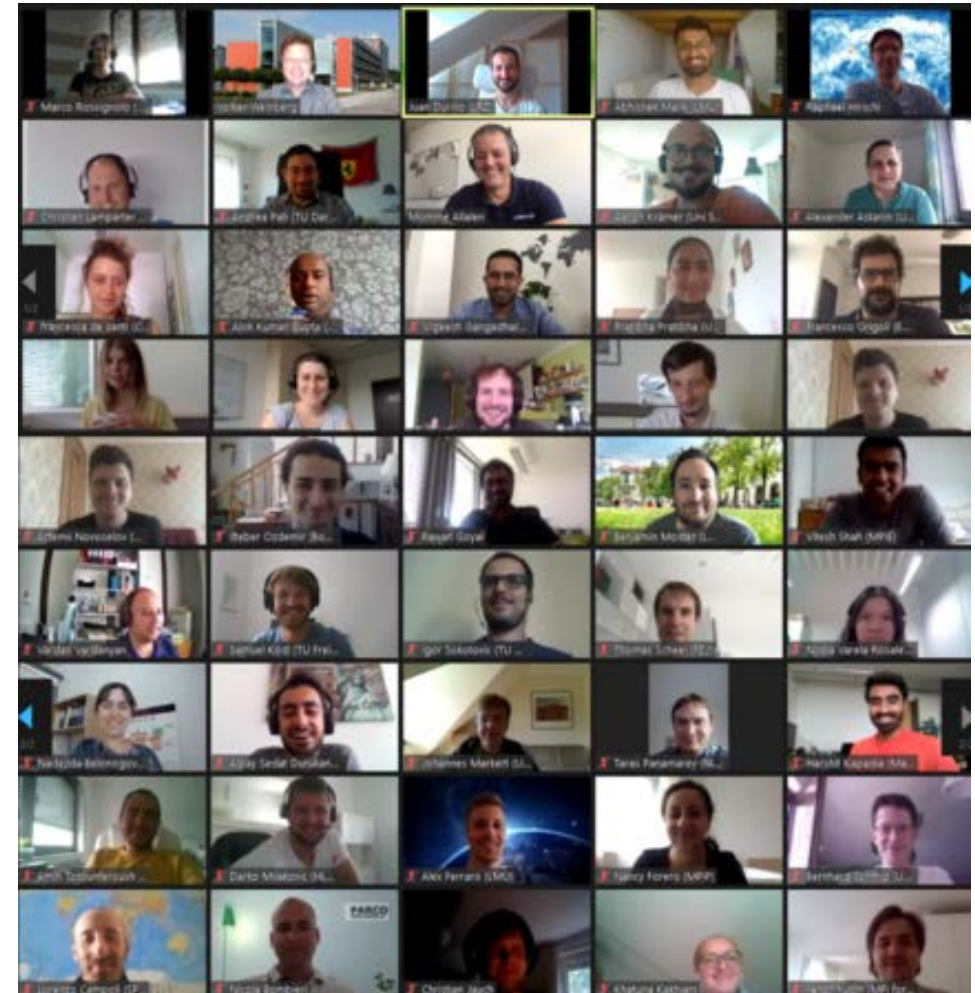
<https://tinyurl.com/gcs-article>

- The **transition** from onsite to online training is **challenging**.
- **No previous experience** with online training at GCS (except for MOOCs by HLRS).
- **No plans** for online training in 2020/21.
- Selection of an **adequate video conferencing tool for online courses** which allows to **preserve the interactive nature of onsite courses** as much as possible with support for e.g. Polls, Instant Feedback, Breakout Sessions.
- **Pedagogical review and improvement/restructuring of class room concepts** for online training:
 - Enhancement of interactivity,
 - Smaller units with alternation of theory and practice,
 - Adaptation of the training material and especially the exercises.
- Significantly **higher need for teaching/assisting personnel** during an online course.

Online Training at LRZ



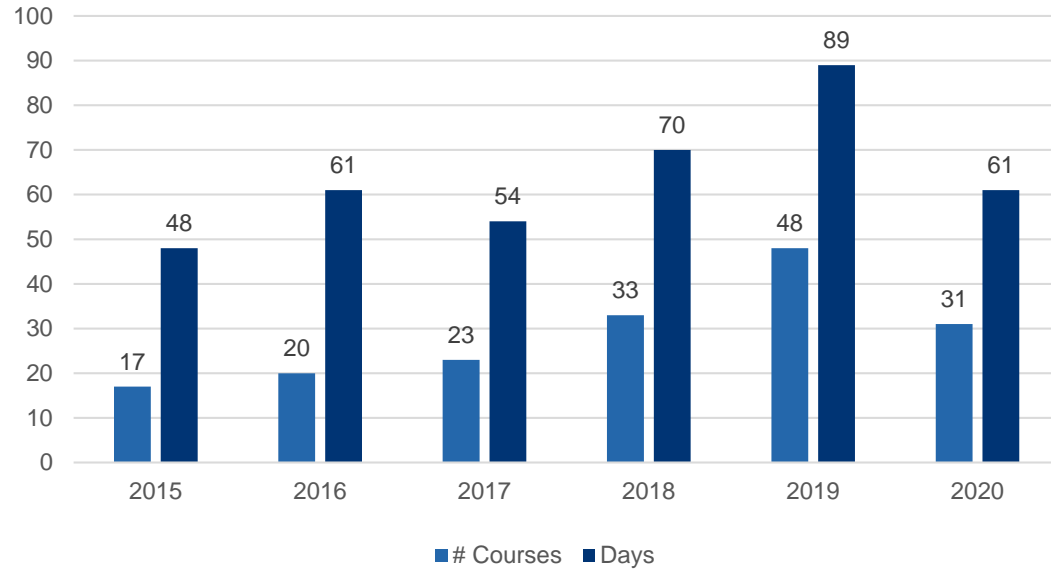
- Since the pandemic hit Germany in March 2020, LRZ virtually hosted and co-hosted **1394 participants across 33 different online training courses**.
- Many participants enjoyed participating in training events **without having to travel**, some of the additional trainer costs was recouped by **not paying for trainers' and teachers' accommodation**.
- Online training allowed LRZ to expand its training footprint to HPC professionals in around **40 different countries**, exposing both participants and trainers to a wider range of applications and problems.
- Based on the positive feedback and success of online courses, LRZ envisions **virtual training courses remaining a part of the LRZ training portfolio**.



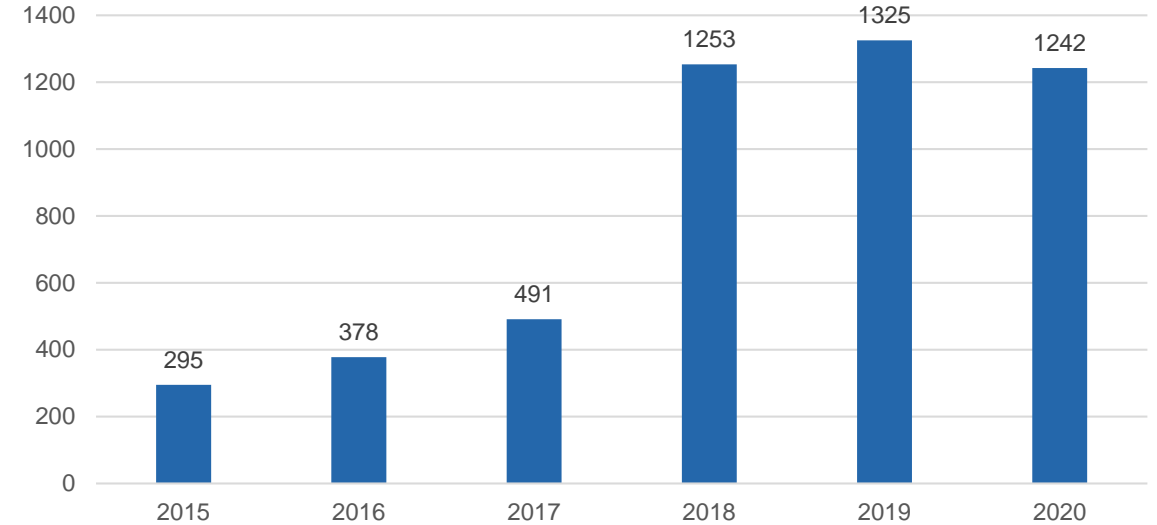
Statistics: LRZ 2015-2020



Number of Courses, Course days 2015-2020



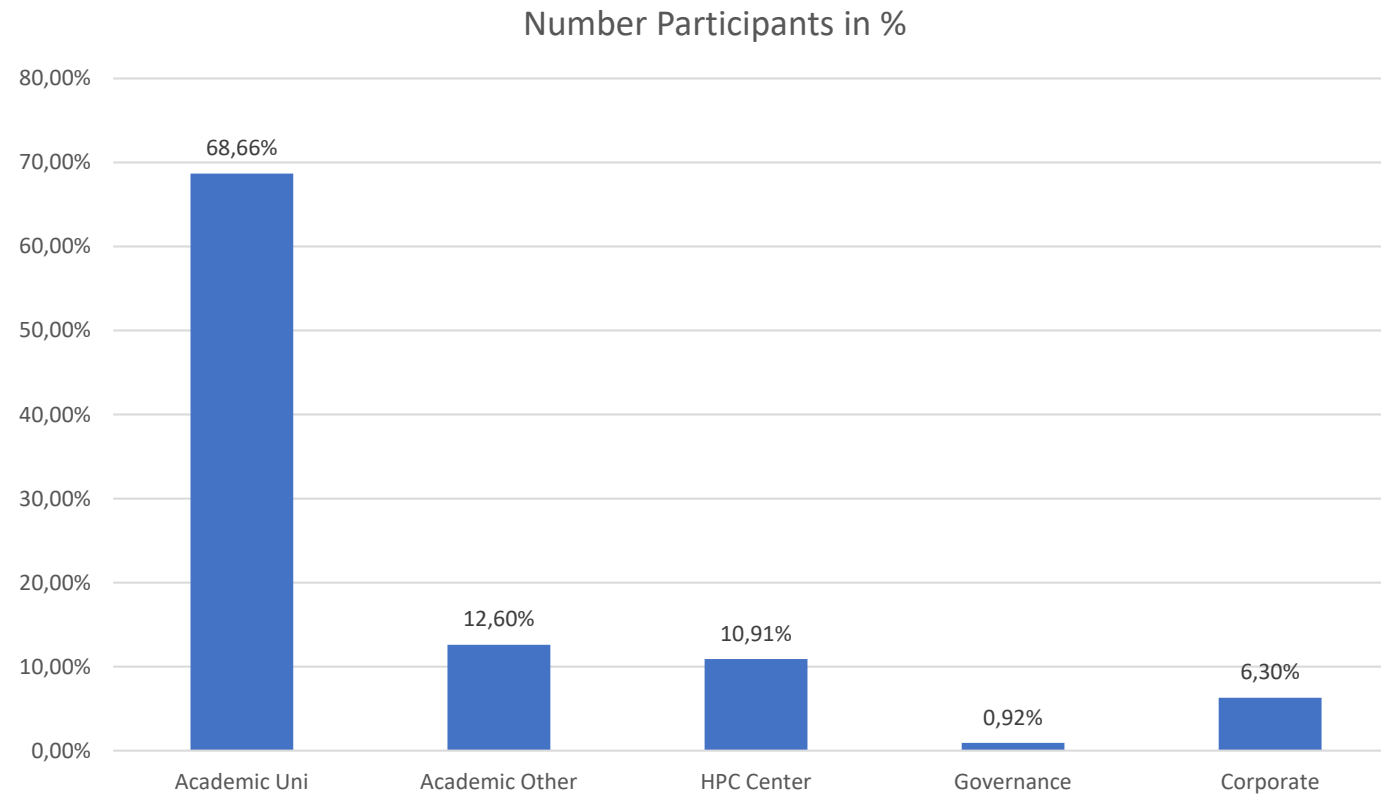
Participants 2015-2020



Statistics: Academic – Governance – Corporate 2019-2021



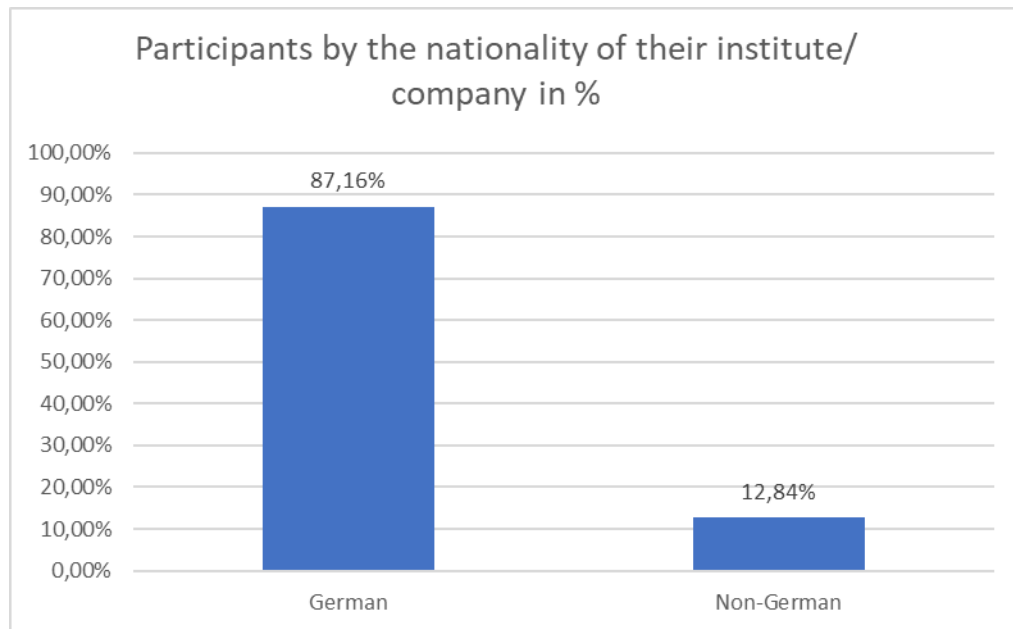
PRACE Courses @ LRZ Jan 2019 – Mar 2021 (651 participants)



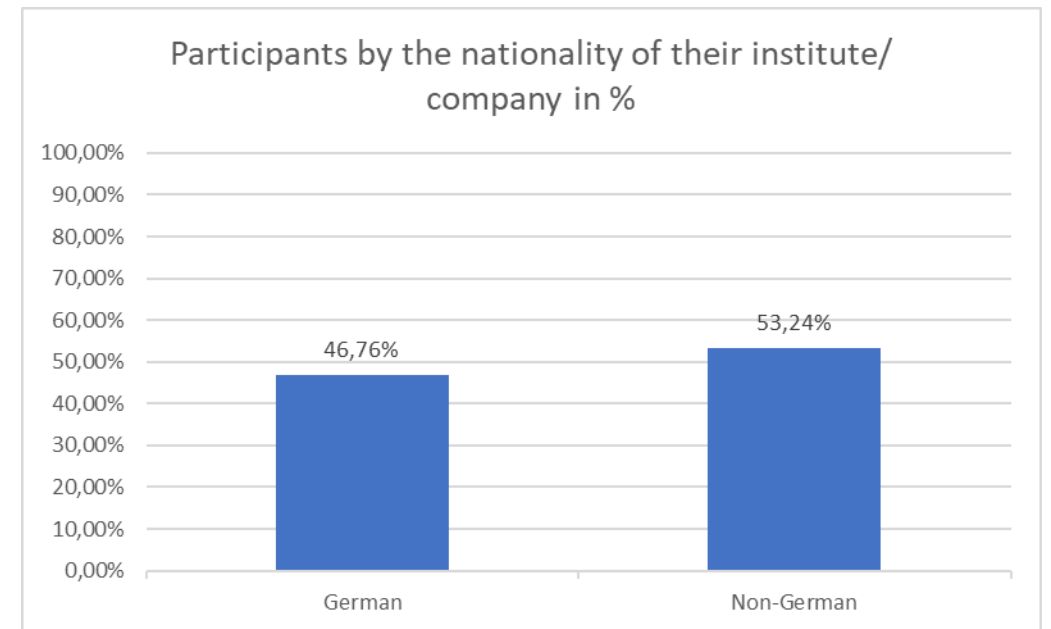
Statistics: Participants by the Nationality of their Institute 2019-2021

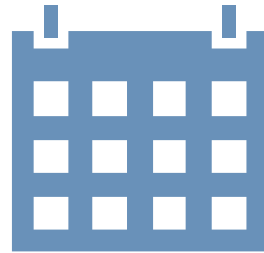


PRACE Courses @ LRZ
Jan 2019 – Feb 2020
Onsite
(296 participants)



PRACE Courses @ LRZ
Mar 2020 – Mar 2021
Online
(355 participants)





- **Information on courses and workshops:**

- by LRZ: <http://www.lrz.de/services/compute/courses/>
- by the Gauss Centre of Supercomputing (GCS): <http://www.gauss-centre.eu/training>
- by German Centres (collected by the Gauß-Allianz): <https://hpc-calendar.gauss-allianz.de/>
- by the Partnership for Advanced Computing in Europe (PRACE): <http://www.training.prace-ri.eu/>
- by other European actors: <https://hpc-portal.eu/>, <https://www.eurocc-access.eu/>



- **Mailing Lists**

- Subscribe via <https://lists.lrz.de/mailman/listinfo/aktuell> to get regular information on events, courses, workshops, positions etc. at LRZ.
- Subscribe via <https://prace-ri.eu/subscribe-to-prace-mailing-lists/> to the PRACE training mailing list, to get regular information on PRACE training.

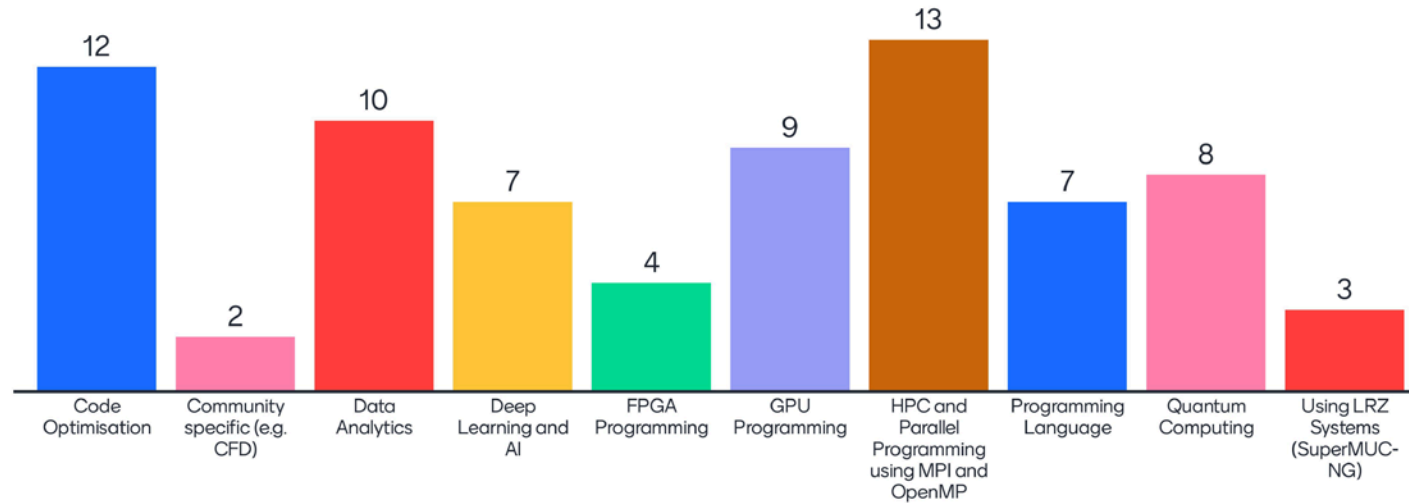
- **Contact:**

- education@lrz.de

The next slides are from a live voting during the workshop after the presentation.

Which of the following training topics would you be interested in?

Mentimeter



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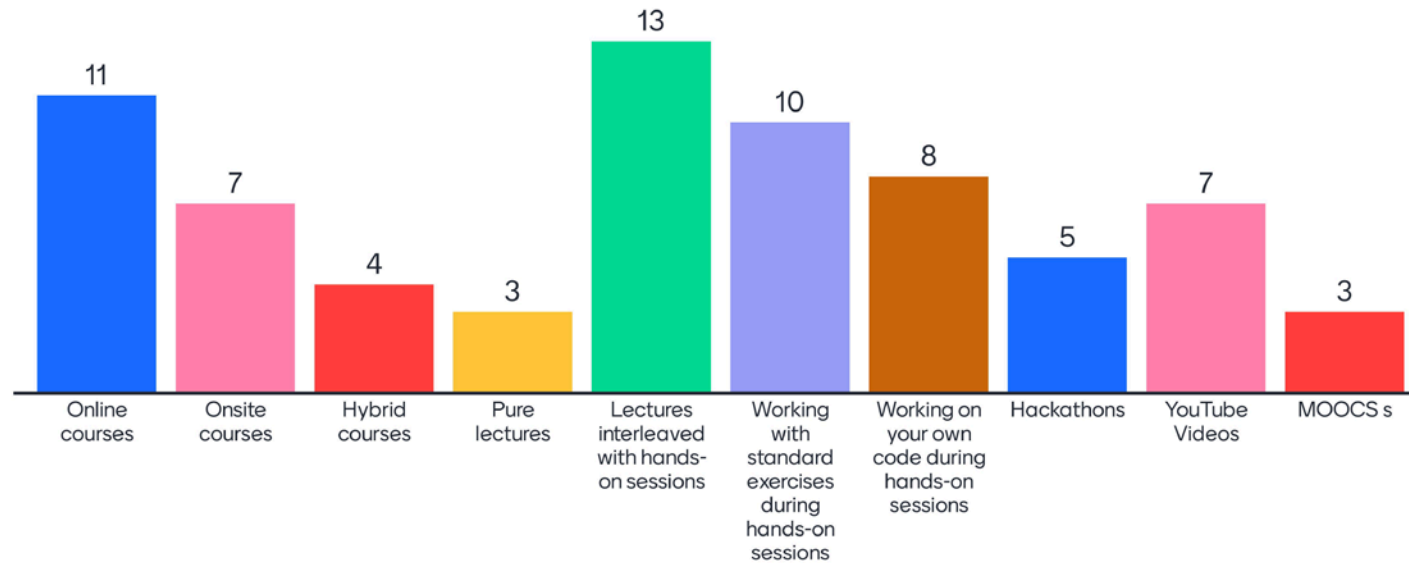
Which other topics would you be interested in?

 Mentimeter



Which training formats would you prefer?

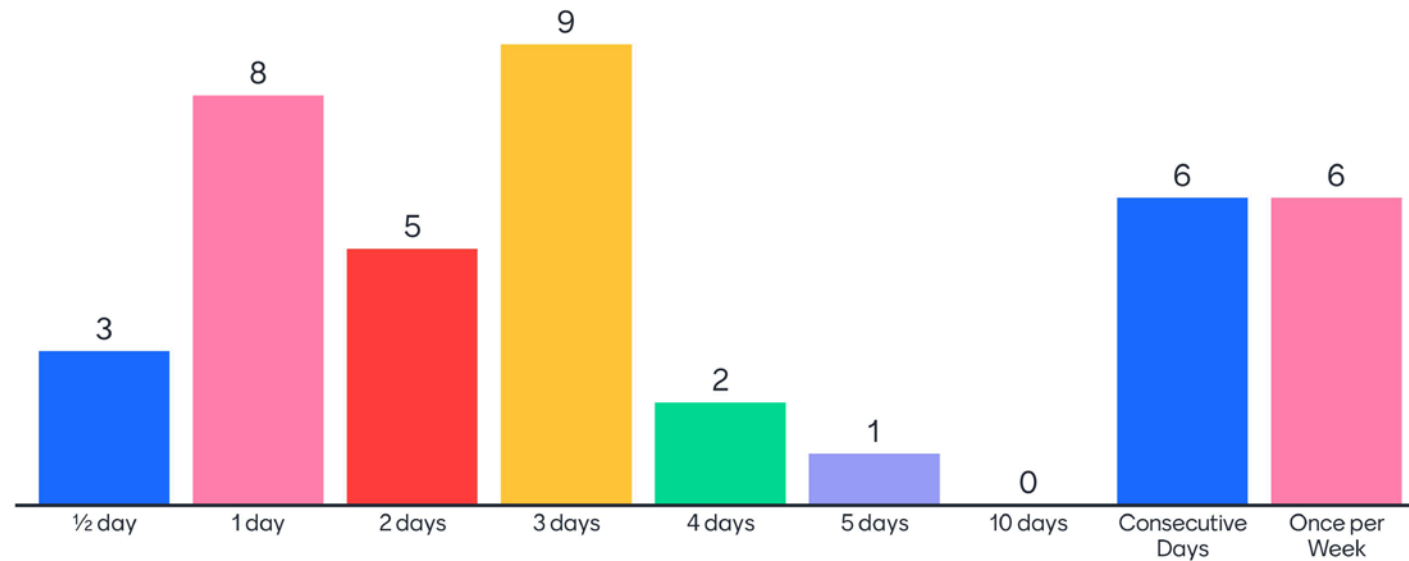
Mentimeter



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What is your preferred time format?

Mentimeter



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Thank you for your attention!

We are looking forward to meeting you in a future education and training event at LRZ!