

GPU Programming Workshop

LRZ | 8 – 12 June 2026

Overview



- In this 3.5-day online workshop you will learn how to accelerate your applications with OpenACC, OpenMP, Kokkos, and CUDA C++ on NVIDIA GPUs.
- The lectures are interleaved with many hands-on sessions using the JupyterHub at NHR@FAU to access the Alex cluster, see <https://doc.nhr.fau.de/clusters/alex/>
- The workshop is co-organised by Leibniz Supercomputing Centre (LRZ) and Erlangen National High Performance Computing Center (NHR@FAU).





- Dr. Momme Allalen (LRZ)
- Dr. Sajjad Azizi (LRZ)
- Dr. Sebastian Kuckuk (NHR@FAU)
- Dr. Volker Weinberg (LRZ)



Tentative Agenda Day 1: Fundamentals of Accelerated Computing with OpenACC



- 09:00-09:30 Welcome
- 09:30-11:00 Introduction and Profiling
- 11:00-12:00 OpenACC Directives
- **12:00-13:00 Lunch Break**
- 13:00-14:00 GPU Programming
- 14:00-15:15 Data Management
- 15:15-15:45 Optimisations
- 15:45-16:00 Q&A, Final Remarks



All times are in CEST

Tentative Agenda Day 2: Fundamentals of Accelerated Computing with OpenMP and Kokkos



- **09:00-12:00 Fundamentals of Accelerated Computing with OpenMP**
- **12:00-13:00 Lunch Break**
- **13:00-16:00 Fundamentals of Accelerated Computing with Kokkos**



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Tentative Agenda Day 3:

Fundamentals of Accelerated Computing with CUDA C/C++ Part I



- **09:00-12:00 Fundamentals of Accelerated Computing with CUDA C/C++ (incl. Coffee Break):**
 - Introduction – learn about course structure, tools used and how to navigate code examples
 - First GPU Application – experience the fundamentals of GPU programming with CUDA
 - Porting Applications – extend previous knowledge with methods for data handling, CPU-GPU transfers, using managed memory and setting up simplistic performance models
- **12:00-13:00 Lunch Break**
- **13:00-16:00 Fundamentals of Accelerated Computing with CUDA C/C++ (incl. Coffee Break)**
 - GPU Architecture – connect your programming skills with the characteristics of GPU hardware and examine the influence of parameter choices
 - Reductions – deep dive into an ubiquitous computational pattern – reductions – and apply incremental optimizations
 - Summary & Outlook – step back for a moment to summarize what you have learned so far

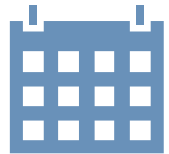


All times are in CEST

Tentative Agenda Day 4: Fundamentals of Accelerated Computing with CUDA C/C++ Part II



- **09:00-11:45 Fundamentals of Accelerated Computing with CUDA C/C++ (incl. Coffee Break)**
 - Debugging – discover how to debug your parallel GPU applications in practice
 - Streams – apply new dimensions of concurrency to maximize performance
- **11:45-12:00 Q&A, Final Remarks**



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Workshop Webpage



- All slides will be made available during the workshop under:

<https://tinyurl.com/hdli1s26>



- Further information on:

- Agenda
- Training Setup
- Slides
- Documentation

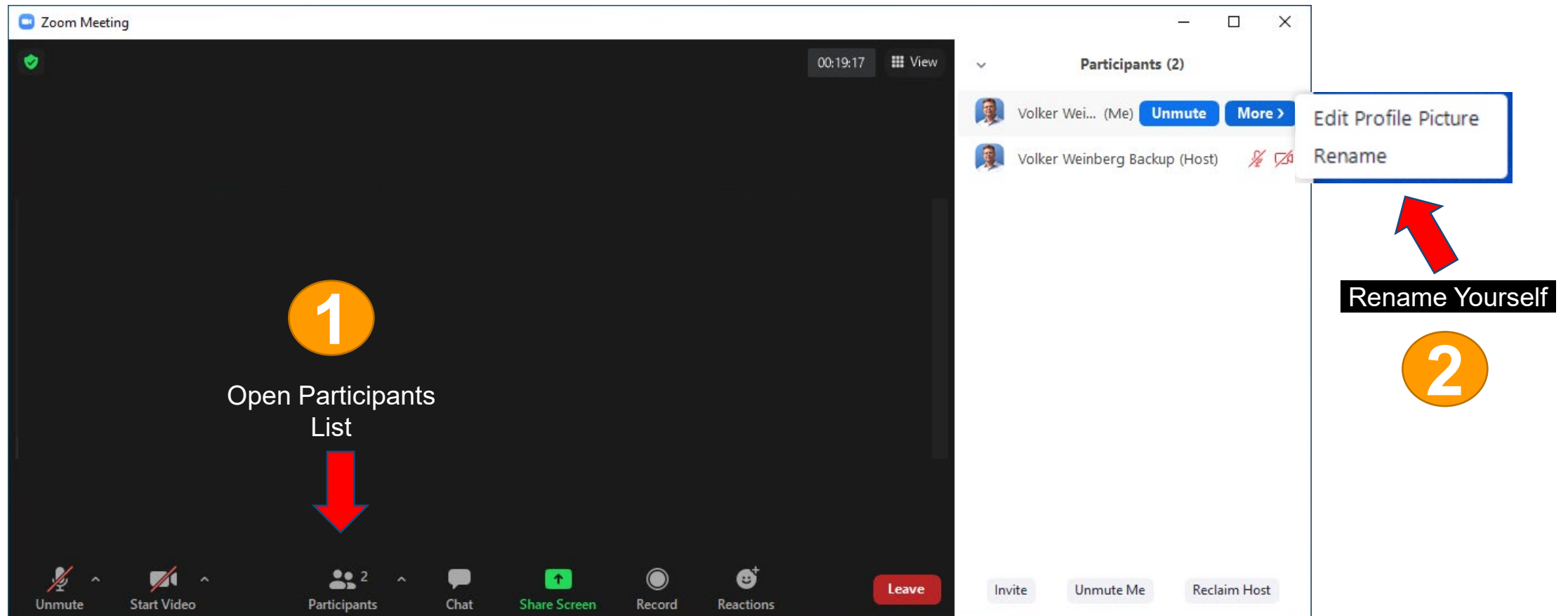


zoom

Participants List

Kindly use “<first name> <last name> (<institute>)” as your screenname.

Otherwise you will not receive a certificate of attendance after the course.



The screenshot shows a Zoom Meeting window. In the bottom toolbar, the 'Participants' icon (two people) is highlighted with a large orange circle containing the number '1'. A red arrow points down from this icon to the text 'Open Participants List'. On the right side, the 'Participants (2)' panel is open. It lists two participants: 'Volker Wei... (Me)' and 'Volker Weinberg Backup (Host)'. For the first participant, the 'More >' button is highlighted with a blue box. A red arrow points from this box to a secondary menu that appears, containing 'Edit Profile Picture' and 'Rename'. A black box with the text 'Rename Yourself' and a large orange circle containing the number '2' is positioned below the secondary menu.

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Open Participants List

Participants (2)

Volker Wei... (Me) Unmute More >

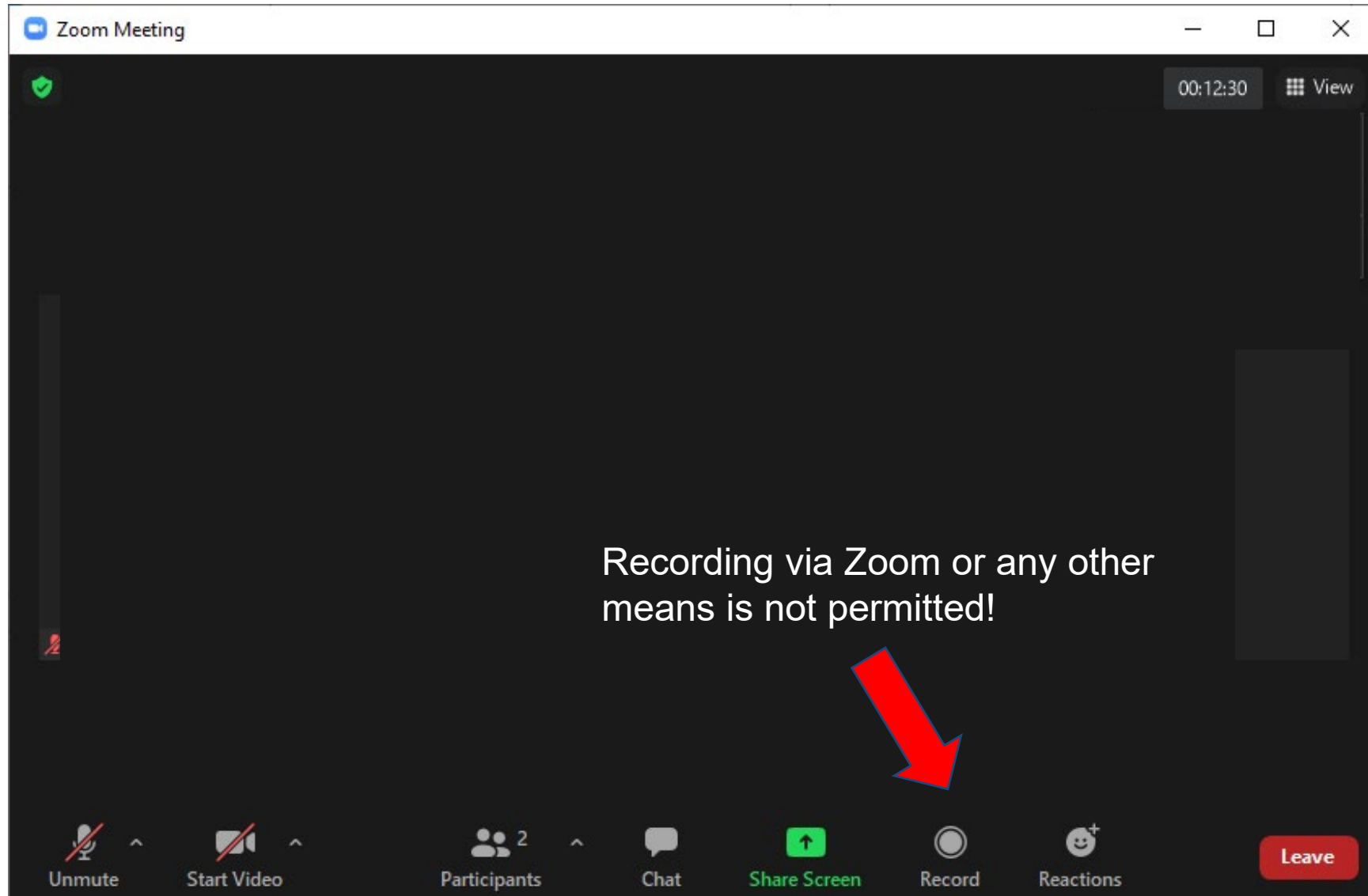
Volker Weinberg Backup (Host) [Muted] [Video Off]

Edit Profile Picture

Rename

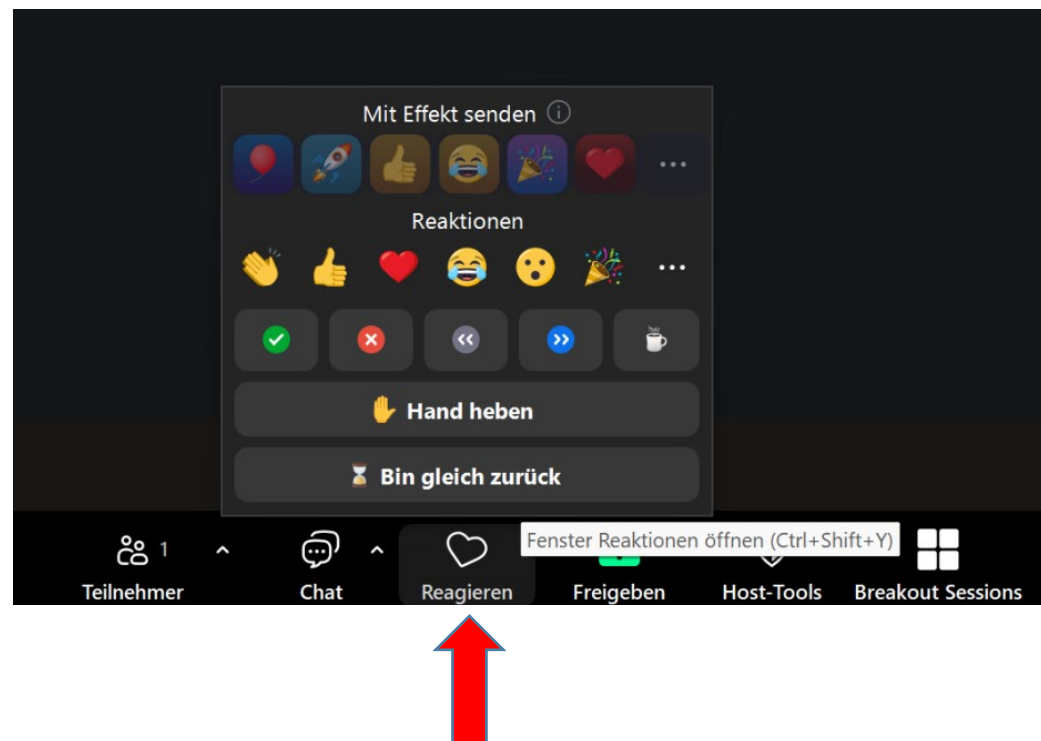
Rename Yourself

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- Please **raise your hand** if you have questions (of general interest).
- You can also use **chat window** to ask questions.
- If you do not mind, please **show your video when asking questions** to make this course as interactive as possible.
- **Push to Talk:** The Push to Talk feature allows you to remain muted throughout the Zoom meeting and only if you hold down the spacebar you will be unmuted.

- **Instant Feedback:**



And now ...



Enjoy the workshop!