PRACE Course: Advanced Fortran Topics

21 – 24 November 2022

PRACE Training

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

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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/

Lecturers

- **Lecturers**:
  - Dr. Reinhold Bader (LRZ)
  - Dr. Gilbert Brietzke (LRZ)
  - Ivan Pribec (LRZ)

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Agenda

Time	Day 1	Day 2	Day 3	Day 4
10:00 – 10:30	The Environment problem (Bader/Brietzke)	Generic type-bound procedures (Brietzke/Bader)	Interoperation with C (1) (Pribec/Bader)	Advanced synchronization: Events and locks (Brietzke/Bader)
10:30 – 11:00				
11:00 – 11:30	Dynamic memory and object-based design (Brietzke/Bader)	Advanced I/O topics: DTIO, asynchronous processing (Bader/Brietzke)	Interoperation with C (2) (Pribec/Brietzke)	Coarray-related program design aspects (Bader/Brietzke)
11:30 – 12:00				
12:00 – 12:30		Exercise Session 3 and Lunch Break	Exercise Session 5 and Lunch Break	Exercise Session 7 and Lunch Break
12:30 – 13:00	Exercise Session 1 and Lunch Break			
13:00 – 13:30				
13:30 – 14:00	Object oriented programming (1) Type extension and polymorphism (Bader/Brietzke)	Parameterized derived types	PGAS introduction and basic coarray features: declaration, communication, synchronization (Bader/Brietzke)	Composable parallelism with teams Coindexing rules Interoperation with MPI (Bader/Brietzke)
14:00 – 14:30		Creation and destruction of objects (Brietzke/Bader)		
14:30 – 15:00	Object oriented programming (2) Type- and object-bound procedures Dependency inversion with submodules (Brietzke/Bader)			
15:00 – 15:30		Exercise Session 4	Collectives Dynamic memory management (Brietzke/Bader)	Fault tolerance (Bader/Brietzke)
15:30 – 16:00				
16:00 – 16:30	Exercise Session 2	Returning to the Environment problem (Bader/Brietzke)	Exercise Session 6	Exercise Session 8
16:30 – 17:00				
17:00 – 17:30		Exercise Session 4 cont.		

Course Webpage

- All slides and materials will be made available under:
- https://tinyurl.com/advanced-fortran
- Further information on:
  - Agenda
  - Lecture notes
  - Exercise skeletons
  - Solutions for exercises and example code

Participants List

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

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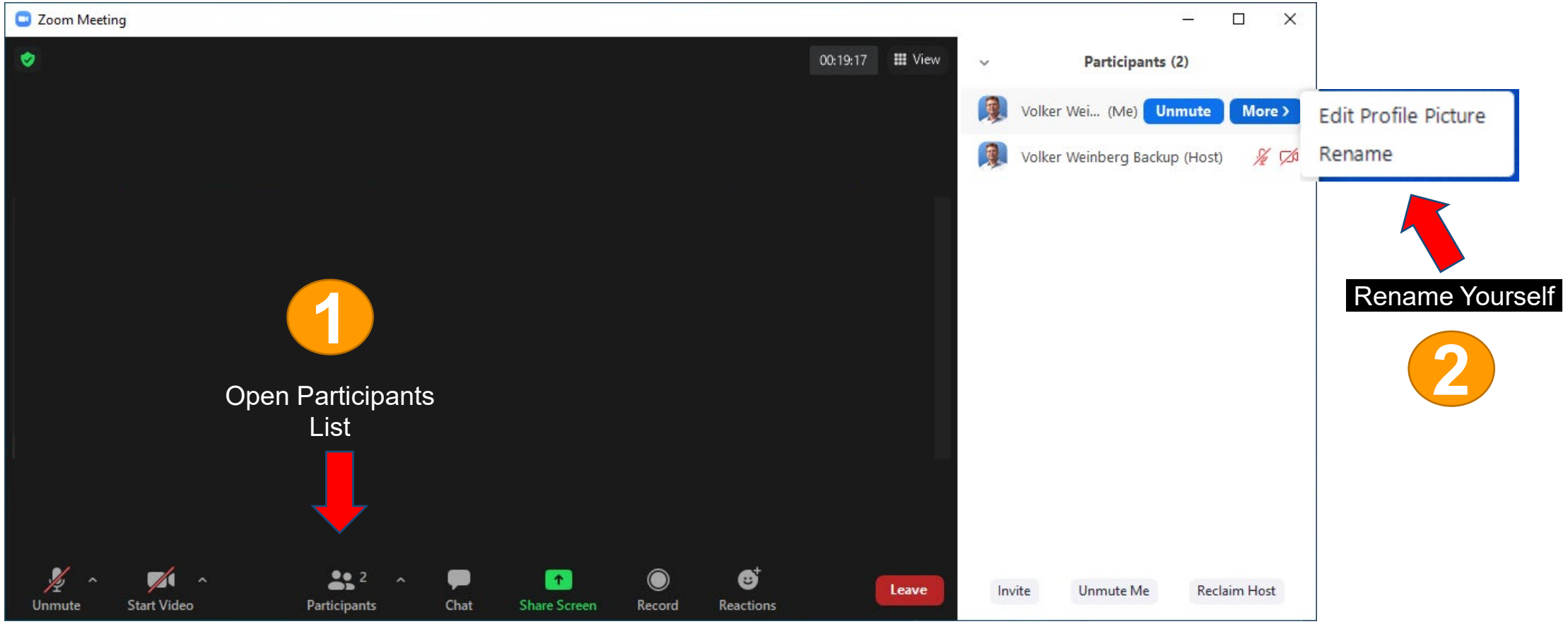
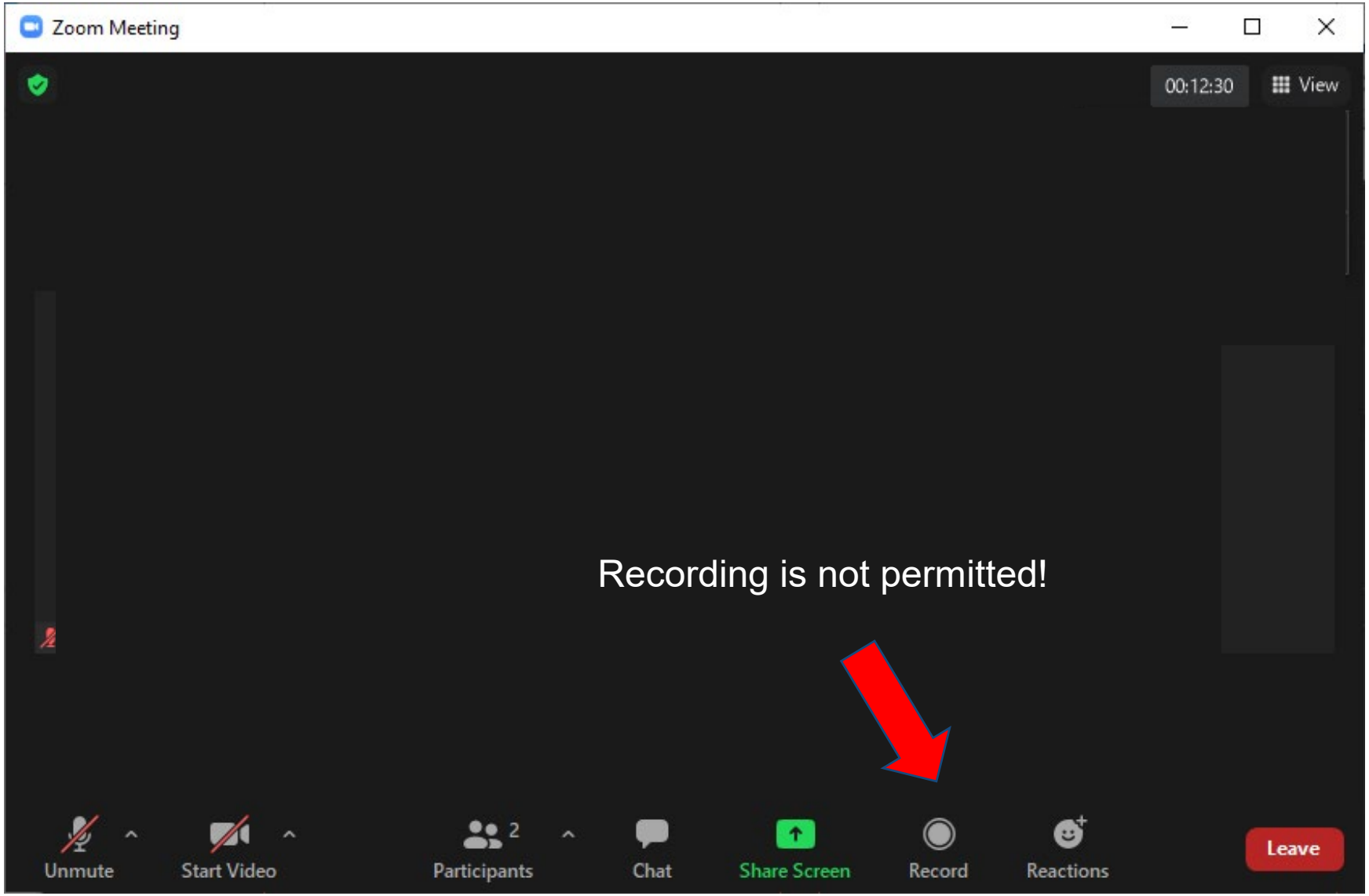
Otherwise you will not receive a certificate of attendance after the course.



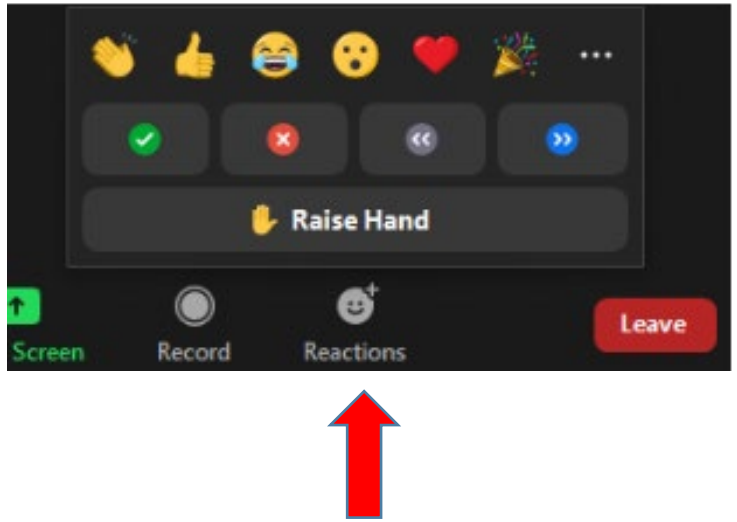
Zoom Recording



zoom Q&A

- 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 course!