ONLINE: PRACE Course: Advanced Fortran Topics

22 – 25 September 2020

PRACE Training

LRZ as part of the Gauss Centre for Supercomputing (GCS), CSC and IT4Innovations belong 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/

Lecturers

- **Lecturers**:
  - Dr. Reinhold Bader (LRZ)
  - Dr. Gilbert Brietzke (LRZ)
  - Nisarg Patel (LRZ)

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Course 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) (Brietzke/Bader)	Advanced synchronization: Events and locks (Brietzke/Patel)
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) (Bader/Brietzke)	Coarray-related program design aspects (Patel/Brietzke)
11:30 – 12:00				
12:00 – 12:30	Exercise Session 1 and Lunch Break	Exercise Session 3 and Lunch Break	Exercise Session 5 and Lunch Break	Exercise Session 7 and Lunch Break
12:30 – 13:00				
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		Returning to the Environment problem (Bader/Brietzke)	Collectives dynamic memory management (Brietzke/Bader)	Fault tolerance (Bader/Brietzke)
15:30 – 16:00				
16:00 – 16:30	Exercise Session 2	Exercise Session 4	Exercise Session 6	Exercise Session 8
16:30 – 17:00				
17:00 – 17:30				

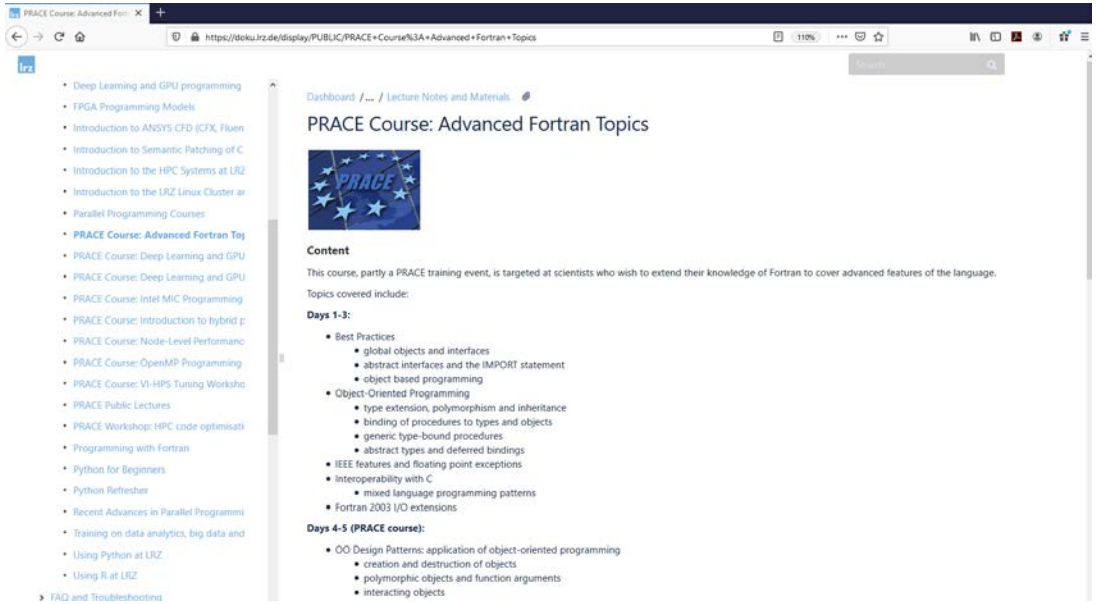
Course Webpage

- All slides and materials will be made available under:

- https://tinyurl.com/advanced-fortran

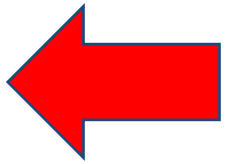
- Further information on:

  - Agenda
  - Lecture notes
  - Exercise skeletons
  - Solutions for exercises and example code
  - ZOOM



Joining the Meeting

Join Zoom Meeting (same link for the complete course)



https://us02web.zoom.us/j/84446215739?pwd=QUhPSlgyUVJraUtKaHM5NHdsTXN4Zz09
Meeting ID: 844 4621 5739
Passcode: 9wDTcu

Please use “first-name family-name (institute)” as your screenname!
You can change your screenname in the participants window as well.

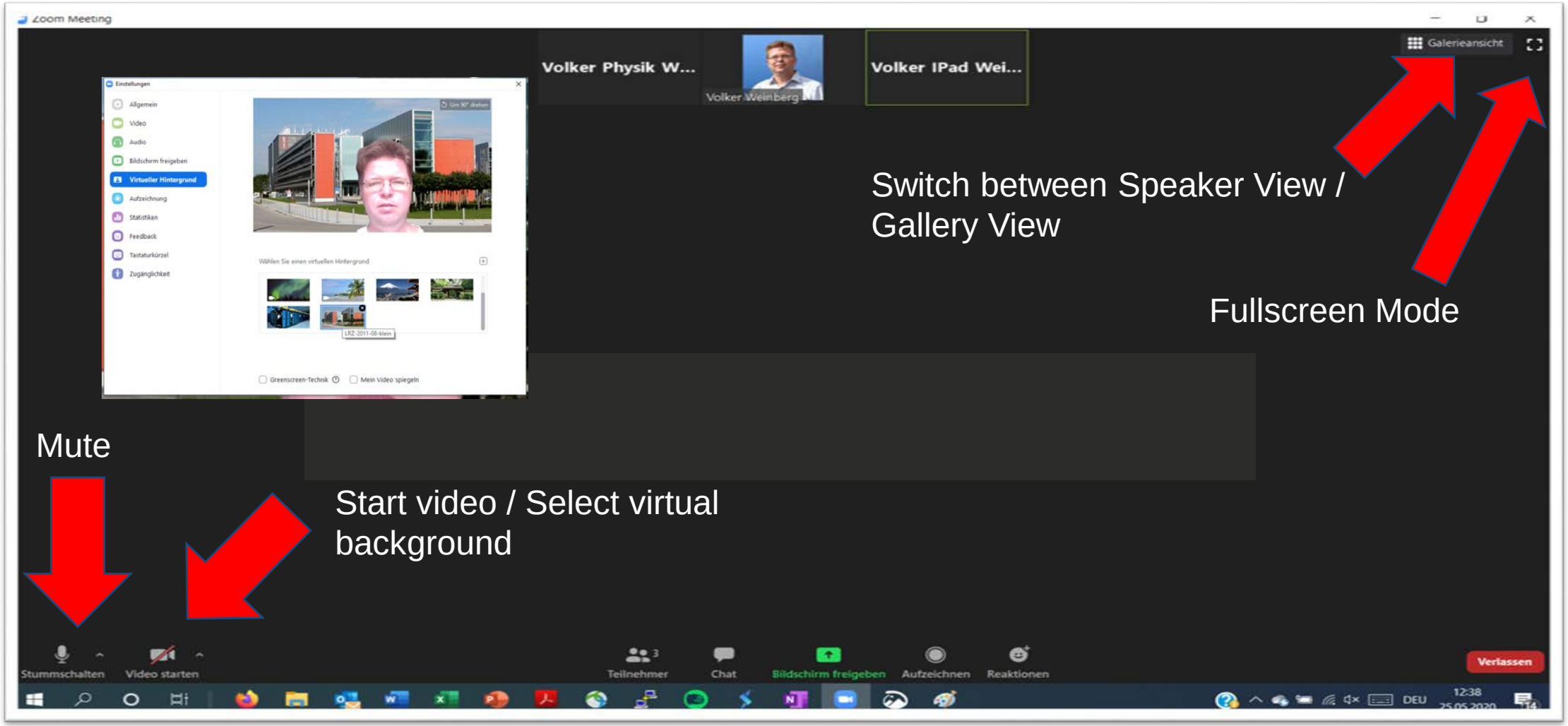
If you have any audio problems, you can also join via phone:

Meeting ID: 844 4621 5739
Passcode: 682792
Find your local number: https://us02web.zoom.us/u/keIFzHf9GO

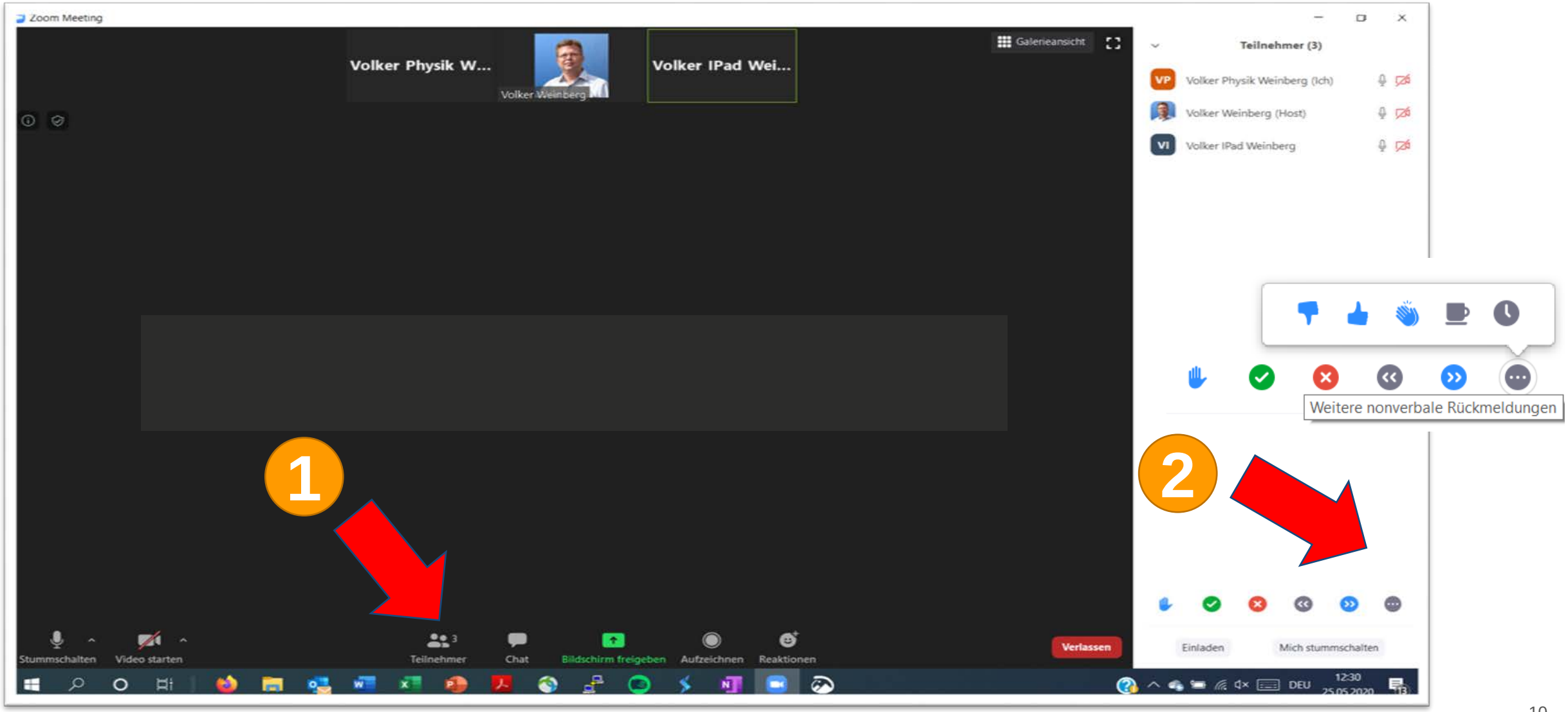
General Information

- **ZOOM help centre** has great resources with help articles and videos for getting started: https://support.zoom.us/hc/en-us.
- This **“Getting Started”** page is a great resource: https://support.zoom.us/hc/en-us/categories/200101697
- This **FAQ** has tons of useful info: https://support.zoom.us/hc/en-us/articles/206175806-Frequently-Asked-Questions.
- We strongly encourage you to read some of the basic info relevant to your operating system:
  - Getting Started on **Windows and Mac**: https://support.zoom.us/hc/en-us/articles/201362033-Getting-Started-on-Windows-and-Mac.
  - Getting Started on **Chrome OS**: https://support.zoom.us/hc/en-us/articles/213298746-Getting-Started-On-Chrome-OS.
- You may log in via the **app or a browser**. We recommend **downloading the app** from https://zoom.us/download for the best experience
- You may sign up for a free account at zoom.us/signup. Or, you may join a meeting as a guest without a Zoom account. It is not necessary for the course to create an account.

Speaker View vs. Gallery View, Virtual Background



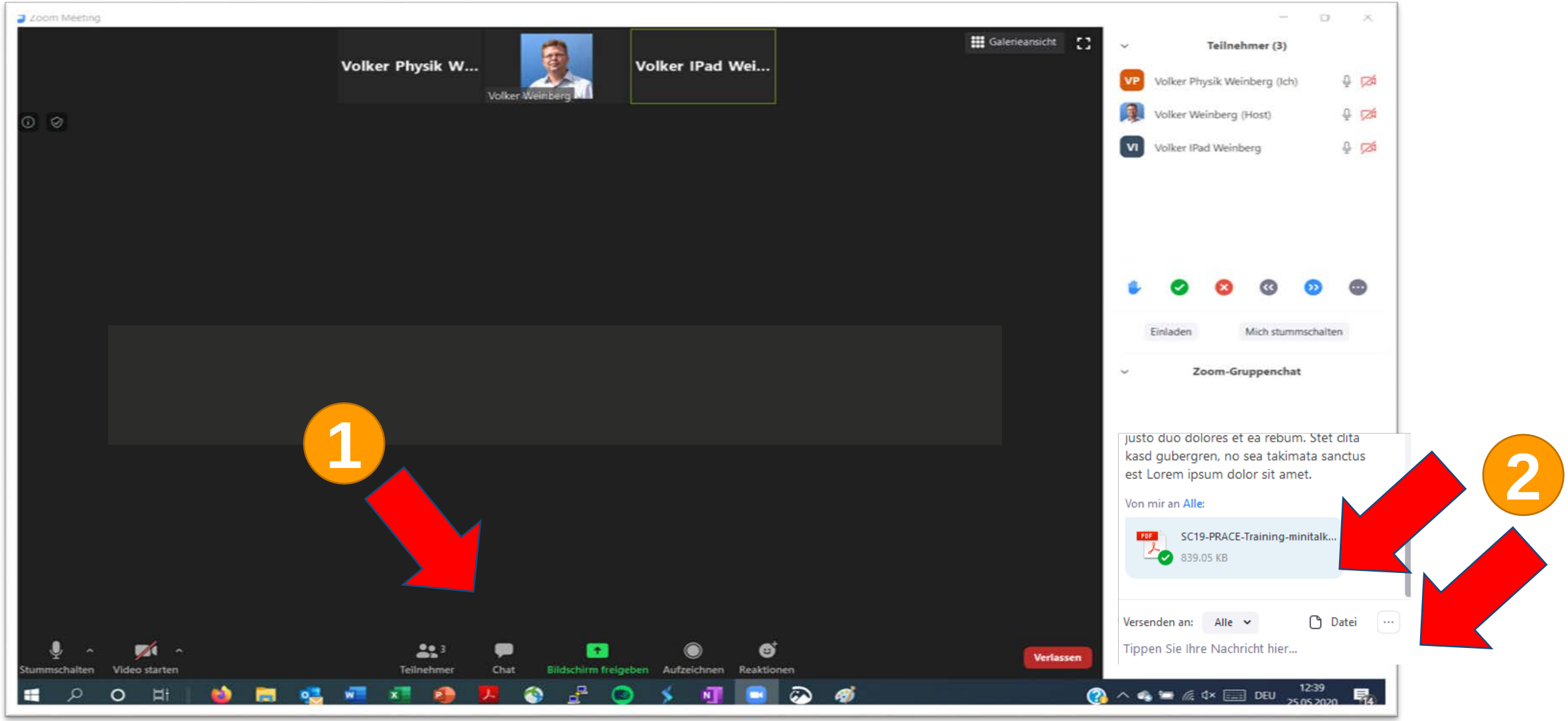
Participant List & Give Instant Feedback



Questions?

- If you do not mind, please show your video when asking questions.
- **Push to Talk:**
  The Push to Talk feature allows you to remain muted throughout your Zoom meeting and hold down the spacebar when you want to be unmuted and talk.
- **Instant Feedback:**

Chat and Share Files



And now …

Enjoy the course!