

# PPCES 2022

Main Event will start at 09:00



PPCES Homepage

<https://blog.rwth-aachen.de/itc-events/event/ppces-2022/>



PPCES Slack Workspace

[https://join.slack.com/t/ppces2022/shared\\_invite/zt-15imh5jyp-ksgtjrQ9Zin3gbnkceggQ](https://join.slack.com/t/ppces2022/shared_invite/zt-15imh5jyp-ksgtjrQ9Zin3gbnkceggQ)



# PPCES 2022: Organization and Cluster Login

HPC.NRW Competence Network



THE COMPETENCE NETWORK FOR HIGH PERFORMANCE COMPUTING IN NRW.

# Schedule – OpenMP

## Monday, March 21

Start	End	Topic	Speaker
09:00	09:10	Introduction	Daniel Schürhoff
09:10	10:30	OpenMP Basics Part 1	Christian Terboven
10:30	11:00	Break	
11:00	12:00	OpenMP Basics Part 2 (incl. Lab)	Christian Terboven
12:00	14:00	Lunch Break	
14:00	15:30	OpenMP Basics Part 3 (incl. Lab)	Christian Terboven
15:30	16:00	Break	
16:00	17:00	OpenMP Basics Part 4 (incl. Lab)	Christian Terboven

## Tuesday, March 22

Start	End	Topic	Speaker
09:00	10:30	Speed Up Your OpenMP Application Without Doing Much	Ruud van der Pas
10:30	11:00	Break	
11:00	12:00	OpenMP SIMD	Christian Terboven
12:00	14:00	Lunch Break	
14:00	15:30	OpenMP Advanced Tasking (incl. Lab)	Christian Terboven
15:30	16:00	Break	
16:00	17:00	OpenMP for Accelerators	Christian Terboven

## Wednesday, March 23

Start	End	Topic	Speaker
09:00	10:30	Introduction to MPI	Marc-André Hermanns
10:30	11:00	Break	
11:00	12:00	Blocking Point-to-Point Communication I	Marc-André Hermanns
12:00	14:00	Lunch Break	
14:00	15:30	Blocking Point-to-Point Communication II	Marc-André Hermanns
15:30	16:00	Break	
16:00	17:00	Non-blocking Point-to-Point Communication	Marc-André Hermanns

## Thursday, March 24

Start	End	Topic	Speaker
09:00	10:30	Blocking Collective Communication	Marc-André Hermanns
10:30	11:00	Break	
11:00	12:00	Communicator Basics	Marc-André Hermanns
12:00	14:00	Lunch Break	
14:00	15:30	Hybrid Programming	Marc-André Hermanns
15:30	16:00	Break	
16:00	17:00	Outlook on Advanced Topics & Wrap-Up	Marc-André Hermanns

**Friday,  
March 25**

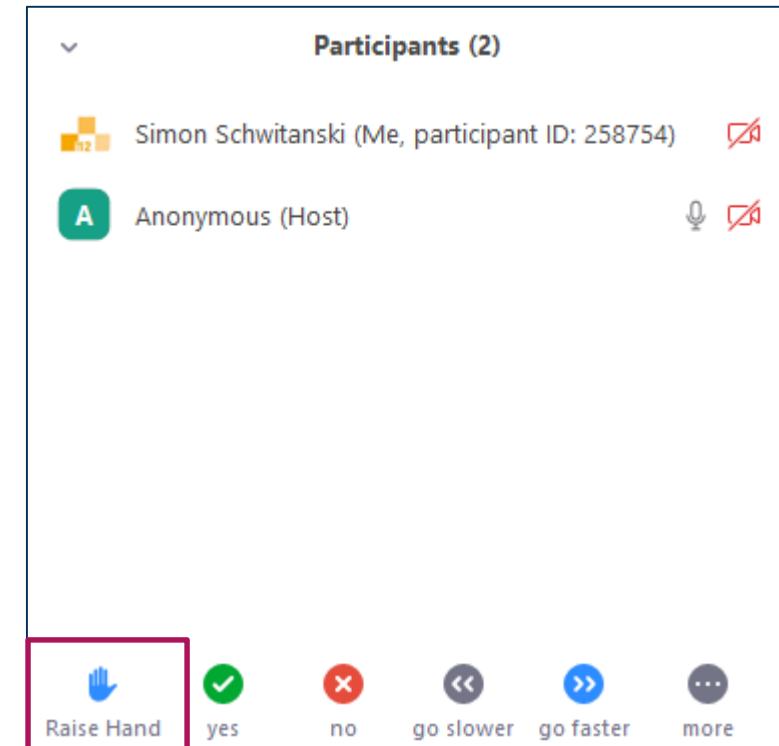
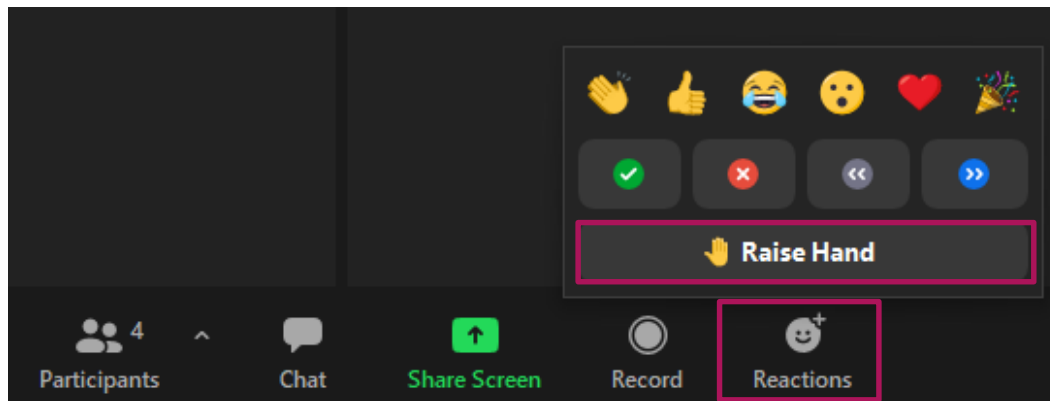
Start	End	Topic	Speaker
09:00	09:45	Introduction to scikit-learn	Georg Zitzlsberger
09:45	10:00	Getting Started on the Cluster	Georg Zitzlsberger
10:00	10:30	Hands-on scikit-learn examples	Georg Zitzlsberger
10:30	11:00	Break	
11:00	12:00	Introduction to Deep Neural Networks	Georg Zitzlsberger
12:00	13:00	Lunch Break	
13:00	14:00	Tensorflow/Keras Exercises (short intro + Hands-on exercise) <ul style="list-style-type: none"><li>• Define Data Pipeline with Dataset</li><li>• Build a Model</li><li>• Train &amp; Visualize with Tensorboard</li></ul>	Georg Zitzlsberger
14:00	15:30	Multi-GPU with Horovod (incl. short Hands-on)	Georg Zitzlsberger
15:30	16:00	Q & A	Georg Zitzlsberger

- This event will be organized in alternating **lecture** and **lab** sessions.
- **Lecture session**
  - Roughly 30 – 45 minutes
  - Presenting contents of a certain topic
  - Short general discussion at the end
- **Exercise session**
  - Applying learned concepts in practice (with help from supervisors)
  - Individual discussions possible

- All course material is available at
  - <https://blog.rwth-aachen.de/itc-events/event/ppces-2022>
- We will continue to add course material during the event.
  
- We will use Slack as communication channel for discussions and Q&A during the lectures and exercises.
- Joining Slack
  - [https://join.slack.com/t/ppces2022/shared\\_invite/zt-15imh5jyp-ksgtjrQ9Zin3gbnkcegjq](https://join.slack.com/t/ppces2022/shared_invite/zt-15imh5jyp-ksgtjrQ9Zin3gbnkcegjq)
  - We will answer your questions live or via text.
  - Individual discussions also possible.
- Please try to avoid the Zoom chat as it is hard to follow discussions there.

# Asking Questions – Zoom Meeting

- You can also ask questions via microphone.
- There is a **raise your hand** feature in Zoom.
- Click on the button if you have a question that you would like to ask “live”.
  - **Do not forget to unmute yourself**





# Accessing the RWTH Compute Cluster “CLAIX”

HPC.NRW Competence Network

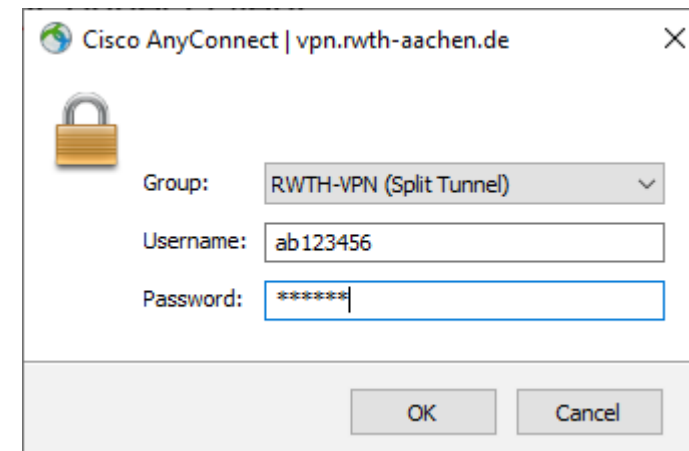
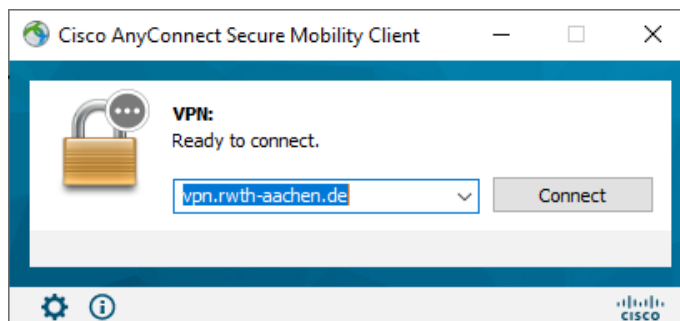


- Only members of RWTH (or affiliated persons) can access the RWTH Computer Cluster
  - If you have not already created an HPC account (“Hochleistungsrechnen”) in the SelfService, please do so here: <http://www.rwth-aachen.de/selfservice>
- External participant have to use their own Linux environment
  - Instructions have been sent via mail

- Connect to the RWTH university network via VPN
- If not done: Configure VPN password in SelfService: <https://rwth-aachen.de/selfservice>
- Download VPN client (Cisco AnyConnect) from [https://webspaces.noc.rwth-aachen.de/shib/Cisco\\_Anyconnect/](https://webspaces.noc.rwth-aachen.de/shib/Cisco_Anyconnect/)
  - Alternative: Any compatible OpenConnect client

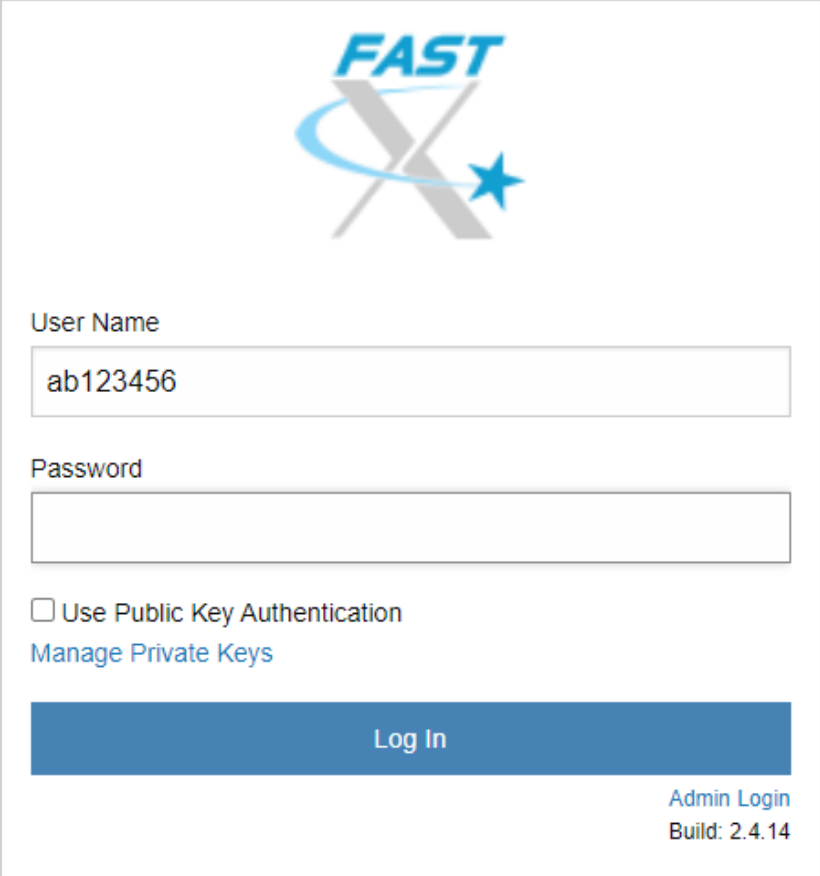
## VPN Connection (2)

- Connect to [vpn.rwth-aachen.de](https://vpn.rwth-aachen.de) with your RWTH User ID and your password
  - Choose “Split Tunnel” group such that only traffic to RWTH network is routed through VPN
  - Connecting to the VPN might interrupt your connection for some seconds



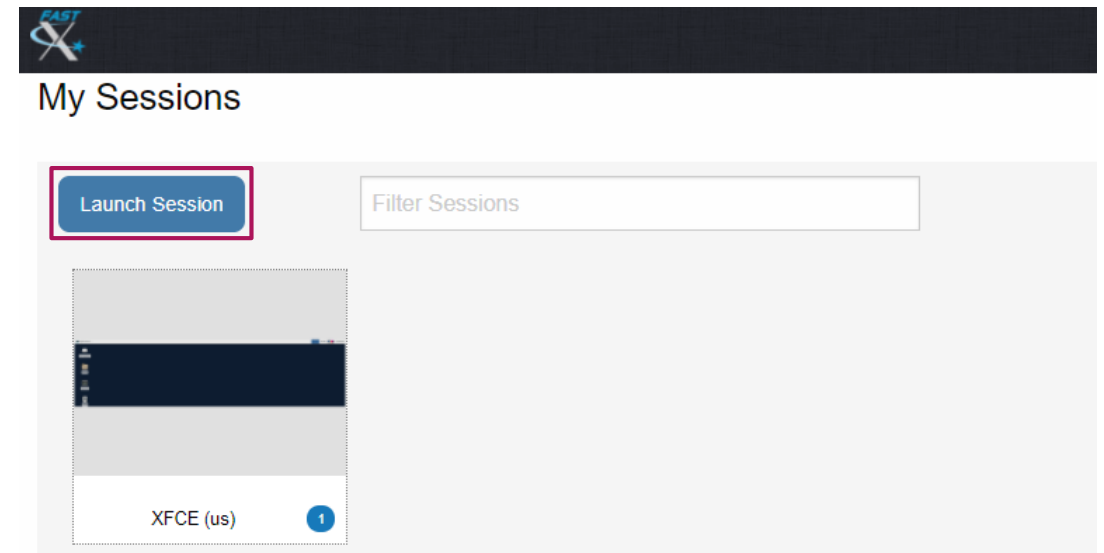
- FastX: Remote graphical desktop sessions, simple and convenient to use
- X-Session systems: login18-x-{1,2}.hpc.itc.rwth-aachen.de
- Browser-based solution (**recommended**): Use the following links
  - <http://login18-x-1.hpc.itc.rwth-aachen.de:3000/>
  - <http://login18-x-2.hpc.itc.rwth-aachen.de:3000/>
  - Login with your RWTH user ID (format: ab123456)
- Alternative: Desktop client
  - <https://www.starnet.com/fastx/current-client>

- Specify your **RWTH user id** and password in the login screen and click on “**Log In**”



The screenshot shows the FAST X login interface. At the top center is the FAST X logo, which consists of the word "FAST" in blue, a large grey "X" with a blue swoosh and star, and a blue star. Below the logo are two input fields: "User Name" containing "ab123456" and "Password" which is empty. Below the password field is a checkbox labeled "Use Public Key Authentication" and a link "Manage Private Keys". A large blue "Log In" button is positioned below these elements. In the bottom right corner, there are links for "Admin Login" and "Build: 2.4.14".

- You can create multiple graphical sessions on the system
- Click on “Launch Session”
  - Select “MATE (us)” (English) or “MATE (de)” (German) for a full desktop environment
  - Alternative: Xfce (other desktop environment) or xterm (X11 terminal)
  - Tab with graphical session will open
- After you are done with your work
  - “Log out” in the graphical session to terminate it
  - Or: Close the browser window, you can resume the session later
- Beware: Dialog systems are rebooted every Monday morning, data that is not stored (e.g., from running applications) will be lost



- SSH from Linux or macOS (or Linux WSL)

```
$ ssh -Y ab123456@login18-1.hpc.itc.rwth-aachen.de
```

- GitBash for Windows: <https://git-scm.com/download/win>

- But: No complete desktop environment by default, only recommended for experienced users.
- You might want to use a multiplexer (Screen, Tmux) to have a persistent session



- If you have any problems with the cluster login, do not hesitate to ask via Slack or raise your hand.
- We can help you individually in a breakout session.
  
- Create Account (and/or a compute time project):
  - <https://www.rwth-aachen.de/selfservice>
  - <https://www.itc.rwth-aachen.de/hpc-projects>
- Download and use VPN (or be in University Network):
  - <https://help.itc.rwth-aachen.de/service/vbf6fx0gom76/article/51b128e3749740d3ab0bffa27acb6906/>
- Connect via SSH or FastX:
  - **SSH:** <https://help.itc.rwth-aachen.de/service/rhr4fjjutttf/article/10c8f0d9b0064013aa439f0b504cc806/>
  - **Gitbash (4 Windows):** <https://git-scm.com/download/win>
  - **FastX:** <https://help.itc.rwth-aachen.de/service/rhr4fjjutttf/article/25f576374f984c888bb2a01487fef193/>
  - **Nodes:** <https://help.itc.rwth-aachen.de/service/rhr4fjjutttf/article/0a23d513f31b4cf1849986aaed475789/>

# Have Fun and Happy Coding!

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- We are looking forward to introducing you to the world of parallel programming!
- Visit us at our webpage: <https://hpc.dh.nrw>
- Visit our YouTube channel for more HPC content: <https://hpc.dh.nrw/youtube>