



# Overview

## JSC OpenACC Course 2019

28/29 October 2019 | Andreas Herten | Forschungszentrum Jülich

# Jülich Supercomputing Centre

- Forschungszentrum Jülich
- Part of Institute for Advanced Simulation (IAS)
- Operates supercomputers and connected infrastructure
- Researches in next-gen supercomputers
- Supports applications leveraging machines
- Supercomputers
  - JUWELS
  - JURECA
  - DEEP
  - JURON/JULIA
  - Former: JUROPA, JUGENE, JUDGE

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# OpenACC Course

- Since 2014
- There are other *many-core* courses
  - CUDA: [April 2020](#)
  - HPC Python: [June 2020](#)
  - → See JSC [training program](#)
- Interactive course – many hands-ons 🙌

# OpenACC Course

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- There are other *many-core* courses
  - CUDA: [April 2020](#)
  - HPC Python: [June 2020](#)
  - → See JSC [training program](#)
- Interactive course – many hands-ons 🙌
- Tutors of this course



**Jiri Kraus**

NVIDIA Application Lab  
at Jülich, NVIDIA



**Thorsten Hater**

High Performance Computing  
in Neuroscience, JSC



**Andreas Herten**

NVIDIA Application Lab  
at Jülich, JSC

# Timetable

Session	Day 1	Day 2
M1	Introduction to GPU Programming <i>Andreas</i>	Performance Optimization <i>Jiri</i>
<i>B</i>	<i>Coffee Break (10:45 - 11:00)</i>	
M2	OpenACC Programming Model <i>Andreas</i>	Interoperability of OpenACC <i>Thorsten</i>
<i>B</i>	<i>Lunch Break (12:30 - 13:30)</i>	
A1	OpenACC Programming Model <i>Andreas</i>	Multi-GPU Programming <i>Jiri</i>
<i>B</i>	<i>Coffee Break (15:00 - 15:30)</i>	
A2	Tools for Debugging <i>Thorsten</i>	Multi-GPU Programming <i>Jiri</i>

# Organizational

- Please sign Attendance List!
- Morning/afternoon breaks: Coffee machines (social room and upstairs)
- Lunch breaks: In canteen (*Casino*)
  - Need to buy payment cards on machine
  - Use machine with slot for entering cards, they provide Guest Cards!
  - 5 € deposit needed, returned when returning card on Tuesday
  - Participants from FZJ will surely help you!



# More Technicalities

- Supercomputer for this course: **JUWELS**
- Infrastructure for tasks
  - Log in to training room computer
  - Generate SSH key pairs  
`ssh-keygen`
  - Upload public SSH key part to JUWELS via JuDoor [judoor.fz-juelich.de](https://judoor.fz-juelich.de)
  - Log in to JUWELS
  - Bootstrap environment (next slide)
- Tasks
  - After bootstrapping, tasks are in `$HOME/OpenACC-Course/` on JUWELS
  - Sorted by session
  - Solutions are always given, you decide how long you tinker before peaking into solutions (Hint: The longer, the more benefit you will get from this course!)

# Bootstrapping Environment

- Log in to JUWELS
- Call bootstrapping script

```
source $PROJECT_training1931/bootstrap.sh
```

- Adds our login script to your environment (with important environment variables and configurations)
- Copy course material to `$HOME/OpenACC-Course`;  
re-sync with command `jsc_material_sync`
- Also safe for (JSC) users with established home directory!
  - Explanation printed; option to manually do steps
  - Backups of existing files created (always)
  - Roll back to old content easily after course
- *Everyone needs to have environment with our `jsccourse-bashrc.sh` sourced!*
- **Do this now!**

# Let's Get Started!

Questions?