

Summer University 2022 Schedule: Week 1

	Mon 11.07	Tue 12.07	Wed 13.07	Thu 14.07	Fri 15.07
9:00-10:45	Welcome G. Peretti Intro HPC V. Karakasis	CUDA S. Keller P. Kanduri	CUDA S. Keller P. Kanduri	OpenACC A. Jocksch	Kokkos M. Simberg
11:00-12:00	Intro GPU architecture S. Keller P. Kanduri	CUDA S. Keller P. Kanduri	CUDA S. Keller P. Kanduri	ISO C++ G. Brito J. Latt	Kokkos M. Simberg
12:00-13:00	Lunch break				
13:00-13:30	Networking sessions: participant presentations				
13:30-15:30	Intro GPU S. Keller P. Kanduri	CUDA S. Keller P. Kanduri	OpenACC A. Jocksch	ISO C++ G. Brito J. Latt	Kokkos M. Simberg
16:00-17:00	Q&A Sessions on Zoom				

Week 2

	Mon 18.07	Tue 19.07	Wed 20.07	Thu 21.07
9:00-12:00	Interactive Supercomputing & Python HPC T. Robinson R. Sarmiento	Introduction to Deep Learning S. Scheidegger A. Eftekhari	Introduction to Deep Learning S. Scheidegger A. Eftekhari	Introduction to Machine Learning & Rapids Y-J Ko
12:00-13:30	Lunch break			
13:30-15:30	Python HPC R. Sarmiento	Introduction to Deep Learning S. Scheidegger A. Eftekhari	Introduction to Deep Learning S. Scheidegger A. Eftekhari	Quiz (13:30) Q&A 15:30-16:30
16:00-17:00	Q&A Sessions on Zoom			

Lecturers

- Vasileios Karakasis (Unit head, CSCS)
- Sebastian Keller (Computational Scientist, CSCS)
- Prashanth Kanduri (Software Engineer, CSCS)
- Andreas Jocksch (Computational Scientist, CSCS)
- Mikael Simberg (Software Engineer, CSCS)
- Tim Robinson (Computational Scientist, CSCS)
- Rafael Sarmiento (Computational Scientist, CSCS)
- Gonzalo Brito Gadeschi (Compute Performance Developer Technology Engineer, NVIDIA)
- Jonas Latt (Professor in Computer Science, University of Geneva)
- Simon Scheidegger (Professor of advance data analytics, University of Lausanne)
- Aryan Eftekhari (Postdoctoral Fellow USI, University of Lausanne)
- Young-Jun Ko (AI Developer Technology Engineer, NVIDIA)

Keynote speakers (in-person event)

- Georg Hager (FAU Erlangen National High-Performance Computing Center, Germany)
- Peter Messmer (Senior Manager, NVIDIA)

Teaching assistants

- Georg Pollak (MSc Student, ETHZ)
- Malik Lechekhab (PhD Student, USI)
- Michal Sudwoj (MSc Student, ETHZ)
- Timothy Holt (PhD Student, USI)
- Andreas Jocksch (Computational Scientist, CSCS)

Organisers

- Guilherme Peretti-Pezzi (CSCS)
- Tatjana Ruefli (CSCS)
- Prof. Olaf Schenk (USI)

Vasileios holds a diploma in Computer and Electrical Engineering and a PhD in computer science from the National Technical University of Athens. He is currently leading the Scientific Computing Support Group at CSCS. He has worked on several scientific code optimisation projects in the past and has co-developed a library for efficient sparse matrix-vector multiplication on multicore architectures. Recently, he has been the lead developer of ReFrame, a software regression testing framework specifically targeted to HPC systems.

Sebastian devoted his academic career to scientific computing, earning an MSc physics degree and a PhD in theoretical chemistry from ETH Zürich, followed by a postdoctoral stay at Stanford University. He has worked on the quantum wavefunction and electronic structure problem and, since joining CSCS, also on molecular dynamics and smoothed particle hydrodynamics.

Prashanth holds a masters degree from ETH Zürich in Computational Science & Engineering. He is a developer in the Scientific Software & Libraries group, working in the area of particle simulations and molecular dynamics on tasks involving API design, simulation workflow engineering, numerical methods, performance engineering, etc. Previous projects included multiphysics/coupled simulations with flavors of finite element methods, geometric modelling and visualization.

Andreas holds a PhD in Mechanical Engineering from ETH Zurich and a master's degree in Mechanical Engineering from the Technical University of Dresden. He is currently working in the Scientific Computing Support group at CSCS.

Mikael is a software engineer focused on parallel programming models in modern C++. He has a master's degree in operations research and computer science from Aalto University in Finland. Since graduating he has worked in industry and academia. Mikael works since 2017 as a scientific software developer at the Swiss National Supercomputing Centre (CSCS) where he contributes to the pika library, an implementation of existing and proposed C++ standards for concurrency and parallelism.

Tim Robinson has more than 10 years experience in high performance computing, having worked for national supercomputing services in the United Kingdom and Switzerland. He is a member of the Compute and Data Science Services group at CSCS where he leads the initiative on Interactive Supercomputing. Tim holds a PhD in Theoretical Chemistry from the University of Otago in New Zealand.

Rafael is part of the Compute and Data Services Support group of the User Engagement and Support unit at CSCS. He obtained his PhD in Physics from the University of Lyon I in 2015. There, he worked on ab initio calculations and prediction of crystal structures. He then moved to the University of Basel for a postdoctoral fellowship on machine learning applied to the prediction of chemical properties of molecular systems. In 2017 he started his current position at CSCS.

Aryan is a postdoctoral researcher in the Department of Economics at HEC Lausanne, a Fellow of the Institute of Computing at Università della Svizzera italiana (USI), and the Study coordinator of the Master in Computational Science program at USI. He holds a Ph.D. in Computational Science from USI. His research focuses on developing parallel algorithms for large-scale machine learning and multivariate statistical problems, with applications in computational economics, finance, and climate change modeling.

Gonzalo is a senior developer technology engineer at NVIDIA. He is passionate about teaching high-performance computing and the use of accelerated platforms to a large community, a passion which he has expressed as a mentor in multiple GPU hackathons and supercomputing tutorial sessions. In the past years, he has helped numerous research groups port their scientific codes to massively parallel HPC systems using ISO C++.

Jonas is associate professor in Computer Science at the University of Geneva (Switzerland). Researcher in the fields of CFD and HPC, and principal author of the widely used parallel CFD code Palabos. An early adopter of C++ standard language parallelism, he used this approach to port Palabos to multi-GPU systems and seized the opportunities of multiple conferences and seminars to teach the principles and advantages of this formalism to the CFD community. Director of the post-doctoral program in computer science for the Universities of Western Switzerland, he is dedicated to teaching and has expressed his conviction for the use of HPC systems in scientific computing as a many-year committee member of CADMOS, the center of scientific computing and high-performance computing of Western Switzerland.

Simon is an assistant professor for advanced data analytics at the Department of Economics, HEC, University of Lausanne. Prior to this, he was a senior research associate at the University of Zürich, and a visiting fellow at Hoover Institution, Stanford University. In addition, he held visiting faculty positions at the Department of Economics at Yale University and at MIT Sloan Finance. He holds a Ph.D. in theoretical physics from the University of Basel. His research is centered around computational finance and economics, where the aim is to design scalable and flexible (machine learning) methods to solve large-scale problems in finance and financial economics.

Young-Jun received an MSc from Saarland University and a PhD from EPFL in computer science. Before joining Nvidia Zurich, Young-Jun worked as a machine learning engineer on representation learning and predictive modeling in a startup in the digital advertising space. As an AI Developer Technology Engineer at Nvidia, Young-Jun is working on optimizing Deep Learning inference and training workloads, with a focus on Transformer models.

Georg Hager holds a PhD and a Habilitation degree in Computational Physics from the University of Greifswald. He leads the Training & Support Division at Erlangen National High Performance Computing Center (NHR@FAU) and is an associate lecturer at the Institute of Physics at the University of Greifswald. Recent research includes architecture-specific optimization strategies for current microprocessors, performance engineering of scientific codes on chip and system levels, and the analytic modeling of structure formation in large-scale parallel codes.

Peter is a director in the HPC Developer Technology group at NVIDIA. He and his team work on tools and technologies to help clients use GPUs to accelerate their scientific discovery processes. Peter holds an MSc and PhD in physics from ETH Zurich, Switzerland, with a specialization in kinetic plasma physics and nonlinear optics.

Georg Pollak is a ETH CSE master student and last year's CSCS summer school participant specializing in HPC and Robotics. His interests and hobbies include everything open source, AI and sports. Feel free to have a chat with him about any of the above.

Malik Lechekhab is a PhD student in High Performance Computing in the Advanced Computing Laboratory at USI and an external teaching assistant at ETH Zurich. He holds a master's degree in Finance from HEC University of Lausanne and his research interests lie in the fields of graph theory, computational economics/finance and climate change. His hobbies include all mountain sports, from hiking to paragliding.

Michal Sudwoj is a MSc student of Computational Science and Engineering at ETH Zurich, and a Data Engineer at Bank Vontobel in the Legal and Compliance Services department. When he is not writing his Master's thesis about bayesian inference, he is tinkering with his home network of Raspberry Pis, working on hobby projects in Rust, or learning photography.

Tim Holt is a PhD student in High Performance Computing under the supervision of Olaf Schenk in the Faculty of Informatics at the Università della Svizzera italiana in Switzerland. He holds a Master of Science in Finance degree from the University of Lausanne and a Bachelor of Commerce degree from the University of Alberta. Tim's research interests are computational optimization of energy systems, energy price prediction models, renewable energy systems, and computational economics.

Guilherme is technical group lead at CSCS. He has a PhD degree in Computer Science and 10+ years of experience in the field of HPC. He worked for both academia, by performing research on parallel programming models, and for industry, with the development of numerical software for computational fluid dynamics simulations.

Olaf is a full professor of computing at the Faculty of Informatics at Università della Svizzera italiana, Switzerland and an external lecturer at the Department of Mathematics at ETH Zurich. His research interests are centered around the topic of multicore and manycore algorithms for computational science simulations on emerging high-performance computing architectures.

Tatjana is Event Manager and Personal Assistant to the Director at the Swiss National Supercomputing Centre (CSCS). She holds a master's degree in Humanities in Japanese Studies and English Studies, and a bachelor's degree in Philosophy from the University of Geneva. Before joining CSCS Tatjana worked in non-profit foundations based in Switzerland and in the USA developing international programs and organizing events. She is co-creator of a social enterprise in the Mongolian countryside. Areas of interest: education, languages, and cultures.