

# Hauptseminar „Strategies of Modern High-Performance Computing“ Sommersemester 2025

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IPVS, SC

Preliminary meeting: 09.04.2025, 13.00 – 14.00 Uhr



Bildquelle: HLRS

Whether you're a seasoned student or new to the field of High-Performance Computing (HPC), this seminar offers a comprehensive overview of HPC's role in shaping the future. Delve into the world of supercomputers, exploring parallel processing, vectorization, accelerators, and more.

## Why HPC?

The number of cores in processors has been increasing steadily for years. In a modern era where virtually every device, from wristwatches to data centers, has multiple computing cores, it becomes essential to optimize the utilization of all accessible resources to achieve peak performance. Parallel hardware options span from basic multi-core processors to modern graphic cards and various other accelerator cards. These options extend to data centers and clusters of connected systems. Applications have different needs when it comes to connecting processes, from simple to complex tasks. Because of this, there's a wide range of strategies used for parallelization in modern scenarios.

## What will it be about?

In this seminar, we will discuss various advanced tools and models for parallelization on shared- and distributed- memory architectures, compare the respective limits and possibilities, and take a look at the underlying hardware.

## Requirements

- Sound programming skills (preferably C/C++)
- Interest in efficient parallelization
- Active contribution to the discussions after the presentations
- Language: German (primary), English

## Procedure

- In-person preliminary meeting (topics) and introduction meeting (how-to)
- Submission of a scientific paper
- Review of the papers of other participants and incorporation of the reviews into own paper
- Seminar presentation (in-person block event at the end of the lecture period)
- Attendance at all in-person events is mandatory