

Node-Level Performance Engineering

Georg Hager, Gerhard Wellein, Thomas Gruber, Jan Eitzinger

Erlangen National High Performance Computing Center (NHR@FAU)

<https://go-nhr.de/NLPE-HLRS>

Four-day online tutorial

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Welcome to NLPE-HLRS 2026



Course schedule day 1 <https://go-nhr.de/NLPE-HLRS>

Time	Day 1	Presenter
9:00	Welcome – Intro	GH
9:30	Computer architecture for software developers (1)	GH
10:15	Coffee break	
10:30	Computer architecture for software developers (2)	GH
11:00	Hands-on: Divide benchmark	GH
11:30	Tools: Topology and affinity, frequency	JE
12:00	Lunch Break	
13:00	Hands-On: topology, affinity	JE/GH
13:45	Tools: performance counters	JE
14:45	Coffee break	
15:00	Introduction to the Roofline Model	GH
16:00	Q&A/open end	

Time	Day 2	Presenter
9:00	Roofline case study: Stencil smoothers	
10:00	Hands-on: performance counters and memory bandwidth	
10:45	Coffee break	
11:00	Hands-on: Dense matrix-vector multiplication (I + II)	
12:15	Lunch	
13:15	Roofline case study: Sparse matrix-vector multiplication	
14:45	Coffee break	
15:00	Optimal use of parallel resources: ccNUMA	
15:30	Q&A/open end	

Course schedule day 3

<https://go-nhr.de/NLPE-HLRS>

Time	Day 3	Presenter
09:00	Roofline case study: Tall & skinny matrix-matrix multiplication	
09:30	Hands-on: Matrix-free CG solver	
10:30	Coffee break	
10:45	Optimal use of parallel resources: SIMD in depth	
12:00	Lunch	
13:00	Hands-on: MiniMD analysis	
14:00	Coffee break	
14:15	Basics of Performance Engineering	
15:15	Q&A/open end	