







5-Day-PATC-Course — *Beginners* — 1st day (Monday)

- 08:30 Registration
- 09:00 [1] **Introduction**
- 09:15 [2] **Parallel Architectures and Programming Models** 
- 10:15 Coffee break
- 10:30 [3] **Message Passing Interface (MPI), Introduction**     
- 10:40 [3] 1 Overview
- 11:15 [3] 2 Process Model
- 11:55 [3] 2 Process Model (practical)
- 12:45 Lunch
- 13:45 [3] 3 Messages and Point-to-point Communication
- 14:25 [3] 3 Messages and Point-to-point Communication (practical)
- 15:15 Coffee break
- 15:30 [3] 4 Nonblocking Communication
- 16:15 [3] 4 Nonblocking Communication (practical)
- 16:45 Coffee break
- 17:00 [3] 6-(1) Collective Communication
- 17:45 [3] 6-(1) Collective Communication (practical)
- 18:00 End













Introduction Rolf Rabenseifner
[1] Slide 9 (3days) Höchstleistungsrechenzentrum Stuttgart

H L R | S 

Stuttgart-City-Tour and Social Event (Restaurant to be announced, self paying)

5-Day-PATC-Course — *Beginners* — 2nd day (Tuesday)

- 08:30 [7] **Shared Memory Parallelization with OpenMP**
- 08:30 [7] Overview 
- 09:00 [7] Execution model
- 09:30 [7] Execution model (practical)
- 09:50 Coffee break
- 10:05 [7] Worksharing directives 
- 10:55 [7] Worksharing directives (practical)
- 11:20 Coffee break
- 11:35 [7] Data environment 
- 11:55 [7] Data environment (practical)
- 12:05 [7] Summary 
- 12:25 [7] Pitfalls
- 12:45 Lunch
- 13:45 [7] Pitfalls (continued)
- 14:35 Coffee break
- 14:50 [8a] **Verifying an OpenMP Parallelization with the Intel Inspector XE**  
- 15:25 [8a] **Verifying an OpenMP Parallelization with the Intel Inspector XE (practical)** 
- 15:50 [7] Heat example 
- 16:10 [7] Heat example (homework)
- 16:10 Coffee break
- 16:25 [7a] **OpenMP-4.0 and 4.5 Extensions**  
- 17:10 [30] **Computer room tour and CAVE visualization demo (Uwe Wössner, handout only)**
- 18:30 End

Group	A	B	C	D
16:30	CAVE	Cray	OpenMP-4.0 & 4.5, an Overview	
17:00	Cray	CAVE		
17:30	OpenMP-4.0 & 4.5, an Overview		CAVE	Cray
18:00			Cray	CAVE












7A omp 4.5

ZIH
















D2 ppt

login







5-Day-PATC-Course — *Intermediate* — 3rd day (Wednesday)

- 08:30 [38] **Parallelization of Explicit and Implicit Solvers** 
- 09:45 **Coffee break**
- 10:00 [3] **Message Passing Interface (MPI) - continued**     
- 10:00 [3] 8-(1) Groups & Communicators
- 10:20 [3] 8-(1) Groups & Communicators (practical)
- 10:45 [3] 15 Probe, Persistent Requests, Cancel
- 11:00 **Coffee break**
- 11:15 [3] 12-(1) Derived Datatypes
- 11:50 [3] 12-(1) Derived Datatypes (practical)
- 12:30 **Lunch**
- 13:30 [3] 13-(1) Parallel File I/O - Basics
- 14:00 [3] 13-(1) Parallel File I/O - Basics (practical)
- 14:30 **Coffee break**
- 14:45 [3] 13-(2) Parallel File I/O - Fileviews
- 15:15 [3] 13-(2) Parallel File I/O - Fileviews (practical)
- 15:45 [3] 13-(3) Parallel File I/O - Access Methods
- 16:15 **Coffee break**
- 16:30 [16] **Parallel Performance Analysis and profiling** 
- 17:00 [5] **Parallel Debugging (Christoph Niethammer)**  
- 17:30 [5] **Parallel Debugging (Christoph Niethammer) (practical)**
- 17:55 **Short break**
- 18:00 [3] 5 The New Fortran Module mpi_f08
- 18:30 **End**

5-Day-PATC-Course — *Advanced* — 4th day (Thursday)

- 08:30 [3] **Message Passing Interface (MPI) - continued**     
- 08:30 [3] 10 One-sided Communication
- 09:15 [3] 10 One-sided Communication (practical)
- 09:45 **Coffee break**
- 10:00 [3] 11-(1) Shared Memory One-sided Communication
- 10:45 [3] 11-(1) Shared Memory One-sided Communication (practical)
- 11:15 **Coffee break**
- 11:30 [3] 11-(2) Memory Models and Synchronization Rules
- 12:10 [3] 11-(2) Memory Models and Synchronization Rules (practical)
- 13:00 **Lunch**
- 14:00 [35] **Particle based domain decomposition (Martin Bernreuther)**  
- 14:45 **Coffee break**
- 15:00 [3] **Message Passing Interface (MPI) - continued**     
- 15:00 [3] 9-(1) Virtual Topologies
- 15:30 [3] 9-(1) Virtual Topologies (practical)
- 16:00 **Coffee break**
- 16:15 [3] 7 Error Handling
- 16:30 [16c] **MPI Parameter Tuning (Rainer Keller, HfT)**  
- 17:15 [9] **Access to the federal high-performance computing-centers** 
- 18:00 **End**

5-Day-PATC-Course — *Advanced* — 5th day (Friday)

08:30	[23]	Parallel programming models on hybrid systems / MPI + OpenMP	
10:00		Coffee break	
10:15	[3]	Message Passing Interface (MPI) - continued	    
10:15	[3]	8-(2) Re-numbering on Clusters, Inter-Communicators, ...	
10:45	[3]	8-(2) Re-numbering on Clusters, Inter-Communicators, ... (practical)	
11:05		Coffee break	
11:20	[3]	6-(2) Collective Communication, advanced topics	
11:45	[3]	6-(2) Collective Communication, advanced topics (pract. after next chap.)	
11:50	[3]	9-(2) Virtual Topologies, Neighborhood-communication	
12:00	[3]	9-(2) Virtual Topologies, Neighborhood-communication (2nd+3rd practical)	
12:30		Lunch	
13:30	[3]	12-(2) Derived Datatypes - Resizing, long counts, ...	
14:10	[3]	12-(2) Derived Datatypes - Resizing, long counts, ... (practical)	
14:30		Coffee break	
14:45	[3]	14 MPI and Threads	
15:00	[3]	16 Process Creation and Management (5 slides + 4 skipped)	
15:15	[3]	17 Other MPI features	
15:30		Short break	
15:35	[3]	18 Best practice	
16:05	[3]	MPI-Summary	
16:10		Summary, Q&A	
16:30		End	