






Iterative Linear Solver & Parallelization — Monday

Message Passing Interface (MPI-1, part 1) [Rolf Rabenseifner et al.]

















- 8:30 **Registration** (Foyer)
- 9:00 **Introduction** [1] (talk)
- 9:15 **Parallel Hardware Architectures and Programming Models** [2] (talk) 
- 10:00 **Coffee**
- 10:15 **MPI – Introduction to the Message Passing Interface** [3+3a] (talk)
- 10:20 **Chap. 1 MPI Overview** (talk)     
- 10:50 **Chap. 2 MPI Process model** (talk+practical)
- 12:10 **Coffee**
- 12:25 **Chap. 3 Messages and Point-to-Point Communication** (talk+practical)
- 13:15 **Lunch**
- 14:00 **Chap. 3 Practical (continued)**
- 14:30 **Chap. 4 Non-Blocking Communication** (talk+practical)
- 15:45 **Coffee**
- 16:00 **Chap. 15 Probe, Cancel, Persistent Requests** ([short tour](#))
- 16:15 **Chap. 12-(1) Derived Datatypes** (talk+practical)
- 17:30 **Parallel debugging** [5] (talk) 
- 18:00 **End**
- Introduction Rolf Rabenseifner
[1] Slide 10 (ISL&P)

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

At HLRS

Iterative Linear Solver & Parallelization — Tuesday









MPI-1, part 2 and OpenMP [Rolf Rabenseifner, et al.]

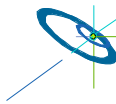
- 8:30 **Access to the federal high-performance computing-centers** [9] (talk)  
- 9:00 **Chap. 9-(1) Virtual Topologies** [3, continued] (talk+practical)     
- 10:10 **Coffee**
- 10:25 **Chap. 8-(1) Groups & Communicators, Environment Management** (talk)
- 10:45 **Chap. 6 Collective Communication** (talk+practical)
- 11:30 **Chap. 7 Error Handling, Chap. 10,11, 13,14, 16,17 Short Overview** [3] 
- 11:45 **Coffee** → More details on Thursday, 16:15
- 12:00 **OpenMP – Overview, execution model** [7+7a] (talk+pract.) 
- 13:00 **Lunch**
- 13:45 **OpenMP – Overview, work sharing** [7+7a] (talk+pract.) 
- 14:45 **Coffee**
- 15:00 **OpenMP – Data environment and combined constructs** (talk+practical) 
- 16:00 **Coffee**
- 16:15 **OpenMP – Summary and Pitfalls** (talk) 
- 17:10 **OpenMP – Heat example** (talk+homework) 
- 17:35 **Short break**
- 17:40 **Verifying an OpenMP Parallelization with the Intel Inspector XE** [-] (talk+pr.)  
- 18:30 **End**
- 

At HLRS

Iterative Linear Solver & Parallelization — Wednesday

Iterative Solvers for Large Linear Systems [Andreas Meister]

- 8:30 **Introduction and Basics (I)** (talk)  
- 10:00 **Coffee**
- 10:15 **Classical Splitting Schemes (II)** (talk)  
- 11:30 **Coffee**
- 11:45 **Practical (Jacobi-scheme, Exercise 1+2)** (practical) 
- 13:00 **Lunch**
- 14:00 **Conjugate Gradient Method (CG) (III)** (talk)  
- 15:15 **Coffee**
- 15:30 **Practical (CG, Exercise 3+4)** (practical) 
- 17:00 **Visualization in the CAVE** (demo-tour)
- 18:00 **End**














Introduction
[1] Slide 9 (ISL&P)

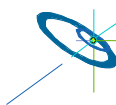
Rolf Rabenseifner

At HLRS

Iterative Linear Solver & Parallelization — Thursday

Iterative Solvers for Large Linear Systems [Andreas Meister]

- 8:30 **Multigrid Methods (IV)** (talk)  
- 9:45 **Coffee**
- 10:00 **GMRES, BiCG and Variants (V)** (talk)  
- 11:30 **Coffee**
- 11:45 **Practical (Multigrid and Krylov subspace methods, Exercises 5+6)** (prac.) 
- 13:00 **Lunch**
- 13:45 **Preconditioning, Teil 1 (V)** (talk)  
- 14:45 **Coffee**
- 15:00 **Preconditioning, Teil 2 (V)** (talk)
- 15:45 **Q & A** [Andreas Meister]
- 16:00 **Coffee**
- 16:15 **MPI Chap. 10-14 More details** [3, Rolf Rabenseifner] (talk)   2nd skip-points [31 slides]
Ch.10 [5], 11[12], 12[3], 13[5], 14[6]
- 17:30 **OpenMP-4.0 and 4.5 Extensions [7A]** (talk)  
- 18:00 **End**














Introduction
[1] Slide 12 (ISL&P)

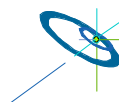
Rolf Rabenseifner

At HLRS

Iterative Linear Solver & Parallelization — Friday

Parallelization Examples [Rolf Rabenseifner]

- 8:30 **Parallelization of Explicit and Implicit Solvers** [38a] (talk) 
- 9:45 **Coffee**
- 10:00 **Laplace-Example with MPI and PETSc**
– **Introduction** [42a] (talk)  
– **Writing a parallel MPI program with a CG solver** [42b] (talk+practical)  
- 12:00 **Coffee**
- 12:15 **PETSc Tutorial** [41] (talk)   
- 13:15 **Lunch**
- 14:00 **Laplace-Example with PETSc** [42c] (talk+practical)  
- 15:15 **Summary and Q&A** (talk+discussion) 
- 15:30 **End**



Introduction
[1]Slide 13 (ISL&P)

Rolf Rabenseifner

At HLRs 