International Graduiertenkolleg 710

Programme of the Course on

Parallel Computing

July 6/7/8 2005

CIP-Pool Otto-Meyerhoff-Zentrum, Im Neuenheimer Feld 350, Basement

Wednesday, July 6, 2005

09:15 — 10:45	**Lecture: Scalable Parallel Architectures**
Room U 013	*Review of processor architecture · Classification of Flynn · Uniform memory access architecture · Nonuniform memory access architecture · Cache coherence problem · Private memory architectures · Network topologies · Example: Scalar product of two vectors · Speedup and Efficiency*
11:15 — 12:45	**Lecture: Shared Memory Programming**
Room U 013	*The thread model · Scalar product example · Critical section problem · Petersons algorithm · Memory consistency · Hardware Locks · Barriers · Semaphores · The dining philosophers*
13:00 — 14:00	Lunch break
14:15 — 17:00	**Practical Programming Work**
Room U 011	*Programming with POSIX threads · Active objects · Various programming assignments*

Thursday, July 7, 2005

09:15 — 10:45	**Lecture: Message Passing Programming**
Room U 012	*Synchronous communication · Asynchronous communication · The message passing interface · Global communication operations · Avoiding Deadlocks: Coloring and time stamps · Remote procedure call*
11:15 — 12:45	**Lecture: Dense Matrix Algorithms**
Room U 012	*Data decomposition of vectors and matrices · Transposition · Matrix-Vector Multiplication · Matrix-Matrix Multiplication · LU-Decomposition*
13:00 — 14:00	Lunch break
14:15 — 17:00	**Practical Programming Work**
Room U 012	*MPI Programming · Various programming assignments*

Friday, July 8, 2005

09:15 — 10:45	**Lecture: Analysis of Parallel Algorithms**
Room U 014	*Time measurements · Speedup and Efficiency · Scalability · Iso-efficiency analysis with examples*
11:15 — 12:45	**Lecture: Iterative solution of linear systems**
Room U 014	*Sparse linear systems · Basic iterative solvers · Multigrid method · Parallel implementation · Graph partitioning problem*
13:00 — 14:00	Lunch break
14:15 — 17:00	**Practical Programming Work**
Room U 012	*Various programming assignments*