Advanced-Course — 1st day (Monday)

Modern Fortran Programming

 9:00 **Fortran Syntax Overview, Part 1** [F1] (talk, 1-85)
10:30 Coffee
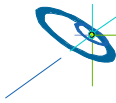10:45 **Fortran Syntax Overview, Part 2** [F1] (talk, 86-144)
11:45 **Fortran Array Syntax** [F2] (talk)
12:00 Lunch
13:00 **Fortran Vectorization** [F3] (talk)
13:45 Coffee
14:00 **Fortran Intrinsics** [F4] (talk)
14:45 **Remarks on Data Structures and Algorithms** [F5] (talk)
15:15 Coffee
15:30 **From Fortran 90 to Fortran 95** [F6] (talk)
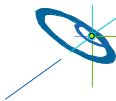16:00 **Programming practical** [F8] (practical)
17:00 End

H L R S

Advanced-Course — 2nd day (Tuesday)

NEC systems at HLRS

 9:00 **Introduction to the new NEC systems at HLRS (H. Berger, NEC)** (talk)
10:00 Coffee
10:15 **Differences SX-5 / SX-6, Basics on Vectorization (Th. Schoenemeyer, NEC)**
11:15 Coffee
11:00 **Vectorization and optimization examples (Th. Schoenemeyer, NEC)** (talk)
12:30 Lunch
13:30 **Indirect addressing, General Strategy for Code Tuning (Th. Schoenemeyer)**
15:00 Coffee
15:15 **Most important compiler switches F90/C++,**
        how to use OMP and MPI on SX (Th. Schoenemeyer, NEC) (talk)

Visualization at HLRS
16:30 **Virtual reality based visualization** [30] (talk and online demo in the "cave")
17:30 End

H L R S

Advanced-Course — 3rd day (Wednesday)

MPI-2 and advanced MPI programming

9:00 **Access to the federal high-performance computing-centers** [9] (talk) **5**
9:30 **MPI-2 overview** [10] (talk) 📄
9:45 **MPI-2 parallel file I/O (basics)** [11+11a] (talk+practical) 📄
10:45 Coffee
11:00 **MPI-2 parallel file I/O (fileviews)** (talk+practical) 📄
12:00 Lunch
13:00 **MPI-2 parallel file I/O (access methods)** (talk+practical) 📄
14:00 Coffee
14:15 **MPI-2 one-sided Communication** [12+12a] (talk+practical) 📄
15:15 Coffee
15:30 **Other MPI-2 chapters** [13] (talk) 📄
16:00 **Optimization of MPI applications** [14] (talk) 📄
16:30 Coffee
16:45 **VAMPIR and other tools for performance analysis** [16, 17] (talk+practical) 📄 📄
17:10 **Application Support at HLRS** [18] (talk) 📄
17:30 End

Advanced-Course — 4th day (Thursday)

Domain Decomposition, Load Balancing, Parallelization with MPI

9:00 **Domain decomposition of structured and unstructured grids** [31] (talk) 📄
10:00 Coffee
10:15 **Load balancing** [32+32a] (talk+practical) German: 📄 📄   English: 📄 📄
11:30 **Particle based domain decomposition** [35] (talk) 📄
12:15 Lunch
13:15 **Object oriented parallel programming with C++** [36] (talk) 📄
14:00 Coffee
14:15 **Parallel programming models on hybrid systems / MPI + OpenMP** [23] (talk) 📄
15:30 **Numerical and parallel libraries** [33] (talk) 📄
16:00 Coffee
16:15 **Parallel numerics** [34] (talk) 📄
17:45 End

Advanced-Course — 5th day (Friday)

Advanced OpenMP programming

 9:00 **Grid Computing: Easy Access to Distributed Resources** [19a] (talk) 🔲

 9:30 **OpenMP – Cluster extensions** [20] (talk) 🔲

10:00 Coffee

10:15 **OpenMP – Tools** [21] (talk) 🔲

10:45 **OpenMP – Performance tuning and OpenMP** [22] (talk+practical) 🔲

12:00 End