Centre for Development of Advanced Computing
Parallel Computing Workshop on PARAM 10000
January 31 (Wednesday) – February 02 (Friday), 2001, at IIT-Kanpur
Hands-on Session:IIT-Kanpur Computer Center

Day 1: Wednesday, January 31

Time (Hrs)	Activity
09:00~09:45	Welcome – Film Show – Glimpse overview of PARAM 10000 and An Overview of Parallel Computing Workshop on PARAM 10000 at IIT-Kanpur
10:00~10:45	PARAM 10000 – An Overview
10:45~11:00	**Tea break**
11:00~11:45	An overview of PARAM 10000:C-DAC HPCC (KSHIPRA) software: Active Messages and CDAC- Message Passing Library (MPI)
11:45~12:30	An overview of Message Passing Interface (MPI)
12:30~14:00	**Lunch**
14:00~18:00	**Hands-on Session** (Day1) on PARAM 10000: Basic MPI programs in FORTRAN and C Examples on MPI Point-to-Point and MPI Collective communications and computation Numerical Integration of π function, Demonstration of programs using HPCC software

Day 2: Thursday, February 01

Time (Hrs)	Activity
09:00~09:45	Parallel Programming Paradigms (Implicit and Explicit Parallelism);Principles of algorith Design - Decomposition techniques; Static and Dynamic load balancing features;
10:00~10:45	PARAM 10000 – HPCC Software: Debuggers and System Management Tools : Performance Visualization tools for Parallel Programs; MPI's Profiling Interface; Upshot – Performance Analysis Tool;
10:45~11:00	**Tea break**
11:00~11:45	An overview of Performance Metrics and Scalability Analysis: Types of Performance requirements, Performance and Workload Speed Metrics; Parallelism and interaction overheads; Overhead measurement methods;
11:45~12:30	Applications: Parallelisation of Composites Analysis software by FEM (FEMCOMP)
12:30~14:00	**Lunch**
14:00~18:00	**Hands-on Session** (Day 2) on PARAM 10000: Vector-Vector multiplication, Infinity Norm of a matrix, Matrix-Vector multiplication and , Matrix-Matrix multiplication algorithms, Demonstration of Parallelization of Composites Analysis (FEMCOMP).

Day 3: Friday, February 02

Time (Hrs)	Activity
09:00~09:45	PARAM 10000 – System and Application Benchmarks: Micro Benchmarks (LINPACK, TOP-500 Benchmark, LMBENCH, STREAM, P-COMS); Macro Benchmarks (NAS, PARKBENCH, SPEC Benchmarks) & Performance Issues
10:00~10:45	Application software: PHEONICS – Computational Fluid Dynamics Software
10:45~11:00	**Tea break**
11:00~11:30	Open Discussions and Conclusions
11:30~12:30	**Hands-on Session (Day 3):** Sparse Matrix-Vector Multiplication, Sample sort algorithm, Conjugate Gradient method, Gaussian Elimination /Jacobi method to solve matrix system of linear equations, Solution of PDE's, Demonstration of PHOENICS
12:30~14:00	**Lunch**
14:00~17:00	Hands-on Session (Day 3): (Continued)