High Performance Computing

Fundamental Concepts

Dr Mark Bull, EPCC
markb@epcc.ed.ac.uk

Aims

- Why do people use HPC?
- What do people use HPC for?
- Understanding of computer hardware
  - Which parts matter for performance in modelling and simulation?
- Understanding of processes and threads
- Understanding of parallel programming models
- How to interact with a HPC resource
- Knowledge of current HPC architectures
- Knowledge of current parallel programming libraries
- Appreciation of the future of HPC

Timetable

09:30 Welcome, Why learn about HPC?, Building Blocks 1: CPUs, Memory, and
         Accelerators

11:00 BREAK: Coffee

11:30 Building Blocks 2: Operating Systems, What does parallel computing mean?,
         Current HPC Architectures

13:00 BREAK: Lunch

14:00 Supporting Software 1: Compilers, Supporting Software 2: Resource Allocation

15:30 BREAK: Coffee

16:00 Parallel Programming: Libraries and Implementations, Future of HPC and Challenges

17:00 Close