HPC Short Course Consortium

Background

- Established 2011

- Response to EPSRC call
  - make more of existing courses through regional cooperation
  - Original emphasis on residential courses (experience from Maths and Stats)

Guiding Principles

- training to ***support*** **PhD supervisor**
  - ➢ wider access to high-level training; honed by supervisor
- two types of course
  - ➢ authoritative **foundation** in programming methods
  - ➢ **advanced topics** in HPC
- ***cooperation*** with other training providers

- "HPC" Is inclusive
  - ➢ compute- & data-limited; stepping from local)

Activities

- Autumn Academy (September, since 2011)
  - 2 weeks; very intensive; C/Fortran; OpenMP/MPI; hardware, optimisation, numerical analysis
  - designed for start of computational PhD.

- Short Residential Courses
  - 2–5 days; advanced topics
    - CUDA Programming on GPUs
    - Algorithm Design and Parallel Algorithms
    - Parallel Programming with Coarray Fortran and UPC
    - Advanced OpenMP
    - Core Algorithms for Performance Scientific Computing

New Training Landscape!

- 130+ new CDTs from summer 2014
- Excellent focused cohort training (year 1)
- Developing(?) structure for years 2–4?
  - some research projects need skills peripheral to CDT expertise? (modelling in a largely experimental CDT?)
  - Local critical mass of expertise in ***all*** related disciplines?
- Need to Cooperate: exploit expertise of computational CDTs, MSc programmes and expert training initiatives

Purpose of today

- Inform about existing opportunities
  - ➢ for summer/autumn 2015
- explore options for innovation
  - ➢ testbeds for 2015/16 or beyond
- Shape EPSRC training policy
  - ➢ at least in respect to high-end e-Infrastructure
  - ➢ What is needed?
  - ➢ What is feasible?

Existing Opportunities

- Autumn Academy (Cambridge), September 2015
  - www.hpc-sc.ac.uk/
- NGCM Summer Academy (Southampton), June 2015
  - ngcm.soton.ac/summer-academy
- EPCC ARCHER and PRACE training
  - www.archer.ac.uk/training
- Hartree Summer Schools
  - https://eventbooking.stfc.ac.uk/news-events/hartree-summer-schools-2015

Existing Opportunities: Advanced Short Courses & CDTs

- Cuda Programming on GPUs (Oxford, July)
- Machine Learning (Cambridge, September?)
- Core Algorithms for performance Scientific Computing (Warwick, Septmber/October?)
- Programming with Fortran (EPCC, by November)
- Imperial CDTs
  - 4 short courses on Git/bitbucket, Python, Matlab & MPI
- Fusion CDT (York)
  - Numerical Methods (python); Plazma Physics Code optimistation (python); Materials Defects (Matlab)
- Diamond CDT (Warwick+)
  - Computational Theoretical Material Modelling (electronic structure and finite element modelling)

Bridging the Landscape!

- explore options for innovation
  - ➢ testbeds for 2015/16 or beyond

- Shape EPSRC training policy (high-end e-Infrastructure)
  - ➢ What is needed? What is feasible?
    - syllabus
    - timetable
    - technology