

Numerical algorithms for high-performance computing

8 – 9 April 2019

Organised by Professor Nicholas Higham FRS, Laura Grigori and Professor Jack Dongarra.

Monday 8 April			
SESSION 1 Chair: Jack Dongarra		SESSION 2 Chair: Laura Grigori	
09.00	Welcome by the Royal Society & lead organiser		
09.15	David E Keyes Hierarchical algorithms on hierarchical architectures	13.25	Rick Stevens Numerical computing challenges for large-scale deep learning
09.45	Discussion	13.55	Discussion
09.55	Katherine Yelick Avoiding, hiding and managing communication in biological data analysis	14.05	Jack Poulson High-performance sampling of determinantal processes
10.25	Discussion	14.35	Discussion
10.35	Coffee	14.45	Tea
11.05	Anna Scaife Big telescope, big data: towards exa-scale with the SKA	15.10	John Shalf Computing beyond the end of Moore's law
11.35	Discussion	15.40	Discussion
11.45	Michela Taufer Algorithms for in situ data analytics in next generation molecular dynamics workflows	15.50	Douglas B Kothe Exascale applications: skin in the game
		16.20	Discussion
12.15	Discussion	16.30	Poster flash talks
12.25	LUNCH	17.00	Poster session
		18.00	CLOSE

Tuesday 9 April			
SESSION 3 Chair: David E Keyes		SESSION 4 Chair: Nick Higham FRS	
09.00	Tony Hey Machine learning and big scientific data	14.00	Guillaume Aupy Memory-aware algorithms for automatic differentiation and backpropagation
09.30	Discussion	14.30	Discussion
09.40	Erin Carson Iterative linear algebra in the exascale era	14.40	Satoshi Matsuoka Post-K: the first 'exascale' supercomputer for convergence of HPC and big data/AI
10.10	Discussion	15.10	Discussion
10.20	Coffee	15.20	Tea
10.50	Steve Furber FRS Stochastic rounding and reduced-precision fixed-point arithmetic for solving neural ODEs	15.50	Michael A Heroux Accelerated sparse linear algebra: emerging challenges and capabilities for numerical algorithms and software
11.20	Discussion	16.20	Discussion
11.30	George Constantinides Rethinking deep learning: architectures and algorithms	16.30	Closing remarks
12.00	Discussion		
12.10	Tim Palmer FRS Reduced numerical precision and imprecise computing for ultra-accurate next-generation weather and climate models		
12.40	Discussion	17.00	CLOSE
12.50	LUNCH		

Draft programme – correct as of 25 March 2019 – subject to change