



A Structured Approach for Programming Extreme-Scale and Heterogeneous Systems

AGENDA

Sunday, Sep 8 - Room: <u>HG F 33.1</u>	<u>Introduction to the Meeting</u>
16:00 - 16:10	Welcome to ETH and Logistics of the Meeting Torsten Hoefler (ETH) / Timo Schneider (ETH)
16:10 - 16:40	Introduction to the Meeting and Participants Stefano Markidis (KTH)
16:40 - 17:10	Inspiring Talk - A Data-Centric Approach to Extreme-Scale Ab initio Dissipative Quantum Transport Simulations 2019 Gordon Bell Prize Finalist - Torsten Hoefler / Timo Schneider / Alexandros Nikolaos Ziogas (ETH)
17:10 - 11:00	Visit to Zurich Old Town + Dinner at Tamarind Hill (https://bit.ly/2m0jhpR)

Monday, Sep 9 - Room: HG F 33.1	Introduction to the Meeting
	Notetaker: Martin Ruefenacht, UTC
08:30 - 08:50	Directive-based Structured Approach for Programming Extreme Scale and Heterogeneous Systems Mitsuhisa Sato (RIKEN R-CCS)
08:50 - 09:10	Runtime Support for Emerging Parallel Systems Siegfried Benkner (University of Vienna)
09:10 - 09:30	MPI and Heterogeneity - It doesn't have to be a contradiction Martin Schulz (TUM)
09:30 - 09:50	MPI extensions for heterogenous systems Tony Skjellum (UTC)
09:50 - 10:10	Streaming Message Interface: High-Performance Distributed Memory Programming on Reconfigurable Hardware - Tiziano De Matteis (ETH)
10:10 - 10:40	Coffee Break
	Notetaker: Martin Ruefenacht, UTC
10:40 - 11:00	Impromptu Talks - Programming Models for Heterogeneous Computing
	Notetakers: Stefano Markidis (KTH), Timo Schneider (ETH)
11:00 - 11:15	Why to program large-scale highly heterogeneous systems is so difficult? Defining the problems and root cause - Group Work
11:15 - 11:30	Presenting the Problems and root cause
11:30 - 11:45	Evaluate the Options for programming large-scale highly heterogeneous systems - Group Work
11:45 - 12:00	Presenting the Options
12:00 - 14:00	Lunch
14:00 - 14:20	Prepare Recommendations for Programming Models for Heterogeneous Computing - Group Work

Monday, Sep 9 - Room: HG F 33.1	Introduction to the Meeting
14:20 - 14:40	Presenting Recommendations
	Performance Portability and Applications on Heterogeneous Systems I
	Notetaker: Niclas Jansson, KTH
14:40 - 15:00	Deploying SIMT code on multi- and many-core processors with wide vector units Michela Becchi (North Carolina State University)
15:00 - 15:20	The H2020 EPEEC Vision to Programming Productivity at Exascale Antonio J. Pena (BSC)
15:20 - 15:40	Performance Portability across Diverse Computer Architectures Tom Deakin (University of Bristol)
15:40 - 16:10	Coffee Break
	Notetaker: Tom Deakin, University of Bristol
16:10 - 16:30	Demystifying Automata Processing: GPUs, FPGAs or Micron's AP? Michela Becchi (North Carolina State University)
16:30 - 16:50	Addressing the Communication Bottleneck: Towards a Modular Precision Ecosystem for High Performance Computing - Hartwig Anzt (Karlsruhe Institute of Technology)
16:50 - 17:10	Lightweight Requirements Engineering for Exascale Co-design Felix Wolf (TU Darmstadt)
17:10 - 17:30	Impromptu Talks - Performance Portability and Applications on Heterogeneous Systems

Tuesday, Sep 10 - Room: <u>LFW E 13</u>	Data Placement and Movement on Heterogeneous Memory and Storage
	Notetakers: Tim Dykes, Cray
08:30 - 08:50	Runtime Data Management in Heterogeneous Memory Systems Dong Li (University of California, Merced)
08:50 - 09:10	Exploiting non-volatile memory Michele Weiland (EPCC)
09:10 - 09:30	Microscope on Memory: FPGA Acceleration of Computer Memory System Assessments Maya Gokhale (LLNL)
09:30 - 09:50	Memory Equalizer for Lateral Management of Heterogeneous Memory Chen Ding (University of Rochester)
09:50 - 10:10	To cohere or not to cohere? + Input from Attendees Shirley Moore (Oak Ridge National Laboratory)
10:10 - 10:40	Coffee Break
	Notetaker: Tiziano De Matteis, ETH
10:40 - 11:00	The path beyond POSIX I/O: evolution or revolution? Glenn Lockwood (LBNL)
11:00 - 11:20	Distributed Services and HPC - Rob Ross (Argonne National Laboratory)
11:20 - 11:40	Impromptu Talks on Data Placement and Movement on Heterogenous Memories
	Notetaker: Stefano Markidis (KTH), Timo Schneider (ETH)
11:40 - 11:55	Why to program data placement and movement on heterogeneous memory systems is so difficult? Defining the problems and root cause - Group Work
11:55 - 12:10	Presenting the problems and root cause
12:10 - 12:25	Evaluate the Options for data placement and movement on heterogeneous systems - Group Work

Tuesday, Sep 10 - Room: <u>LFW E 13</u>	<u>Data Placement and Movement on Heterogeneous Memory and Storage</u>
12:25 - 12:40	Presenting the Options
12:40 - 14:00	Lunch
14:00 - 14:20	Prepare Recommendations - Group Work
14:20 - 14:40	Presenting Recommendations
<u>Performance Portability and Applications on Heterogeneous Systems II</u>	
	Notetaker: Dan Holmes, EPCC
14:40 - 15:00	LUMI: a European pre-exascale system Pekka Manninen (CSC)
15:00 - 15:20	Scientific Software and Library development at CSCS Joost VandeVondele (ETH Zurich / CSCS)
15:20 - 15:40	Measures to increase the scalability of GASPI-based applications Valeria Bartsch (Fraunhofer ITWM)
15:40 - 16:10	Panel on Performance Portability and Applications on Heterogeneous Systems
16:10 - 16:30	Coffee Break and Meeting Closure