Fourth INFN International School on: ”Architectures, tools and methodologies for developing efficient large scale scientific computing applications” ESC12 - Bertinoro (Forlì-Cesena) Italy 21-27 October 2012

Report of Contributions

https://agenda.infn.it/e/5162

Contribution ID: **1** Type: **not specified**

Concepts of performance and efficiency

Monday 22 October 2012 09:00 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 1

Contribution ID: **2** Type: **not specified**

Modern processors and related optimisation topics - Part 1

Monday 22 October 2012 09:50 (45 minutes)

Presenter: Mr JARP, Sverre (CERN)

Session Classification: Session 1

Contribution ID: **3** Type: **not specified**

Modern processors and related optimisation topics - Part 2

Monday 22 October 2012 11:00 (45 minutes)

Presenter: Mr JARP, Sverre (CERN)

Session Classification: Session 1

Contribution ID: **4** Type: **not specified**

Introduction to Performance tuning tools

Monday 22 October 2012 11:50 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 1

Contribution ID: **5** Type: **not specified**

Floating point computation: accuracy, optimization, vectorization (with exercises)

Monday 22 October 2012 14:15 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

Contribution ID: **6** Type: **not specified**

Floating point computation: accuracy, optimization, vectorization (with exercises)

Monday 22 October 2012 15:00 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

Contribution ID: **7** Type: **not specified**

Floating point computation: accuracy, optimization, vectorization (with exercises)

Monday 22 October 2012 16:00 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

Contribution ID: **8** Type: **not specified**

Floating point computation: accuracy, optimization, vectorization (with exercises)

Monday 22 October 2012 16:45 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

Contribution ID: **9** Type: **not specified**

Evening Lecture: ”GPU for scientific computing” - Alessandro Lonardo - INFN Roma 1

Contribution ID: **10** Type: **not specified**

Efficient C++ coding

Tuesday 23 October 2012 08:30 (45 minutes)

Presenter: Dr BINET, Sebastien (LAL/IN2P3)

Session Classification: Session 2

Contribution ID: **11** Type: **not specified**

Efficient C++ coding

Tuesday 23 October 2012 09:20 (45 minutes)

Presenter: Dr BINET, Sebastien (LAL/IN2P3)

Session Classification: Session 2

Contribution ID: **12** Type: **not specified**

Exercises - Basic C++ optimisations

Tuesday 23 October 2012 10:30 (45 minutes)

Presenter: Dr BINET, Sebastien (LAL/IN2P3)

Session Classification: Session 2

Contribution ID: **13** Type: **not specified**

Exercises - Basic C++ optimisations

Tuesday 23 October 2012 11:15 (45 minutes)

Presenter: Dr BINET, Sebastien (LAL/IN2P3)

Session Classification: Session 2

Contribution ID: **14** Type: **not specified**

The Memory Crisis

Tuesday 23 October 2012 14:15 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 2

Contribution ID: **15** Type: **not specified**

How memory allocation works

Tuesday 23 October 2012 15:00 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 2

Contribution ID: **16** Type: **not specified**

Exercises - Memory Allocations

Tuesday 23 October 2012 16:00 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 2

Contribution ID: **17** Type: **not specified**

Exercises - Memory Allocations

Tuesday 23 October 2012 16:45 (45 minutes)

Presenter: Dr ELMER, Peter (Princeton University)

Session Classification: Session 2

Contribution ID: **18** Type: **not specified**

Evening Lecture: ”Architectures of High Throughput DAQ systems” - Niko Neufeld (CERN)

Contribution ID: **19** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 08:30 (45 minutes)

Presenters: Dr ELMER, Peter (Princeton University); Dr BINET, Sebastien (LAL/IN2P3); INNOCENTE, Vincenzo (CERN)

Session Classification: Session 3

Contribution ID: **20** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 09:20 (45 minutes)

Session Classification: Session 3

Contribution ID: **21** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 10:30 (45 minutes)

Session Classification: Session 3

Contribution ID: **22** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 11:20 (45 minutes)

Session Classification: Session 3

Contribution ID: **23** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 14:00 (45 minutes)

Session Classification: Session 3

Contribution ID: **24** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 14:50 (45 minutes)

Session Classification: Session 3

Contribution ID: **25** Type: **not specified**

Exercises (Floating Point, Memory use, C++)

Wednesday 24 October 2012 15:40 (45 minutes)

Session Classification: Session 3

Contribution ID: **26** Type: **not specified**

Parallel programming theory

Thursday 25 October 2012 08:30 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **27** Type: **not specified**

An introduction to OpenMP

Thursday 25 October 2012 09:20 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **28** Type: **not specified**

Synchronization in OpenMP

Thursday 25 October 2012 10:30 (30 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **29** Type: **not specified**

Work sharing constructs

Thursday 25 October 2012 11:15 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **30** Type: **not specified**

The OpenMP data environment

Thursday 25 October 2012 12:05 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **31** Type: **not specified**

I/O Efficiency

Friday 26 October 2012 14:20 (1h 30m)

Presenter: VAGNONI, Vincenzo Maria (BO)

Session Classification: Session 5

Contribution ID: **32** Type: **not specified**

I/O Efficiency

Friday 26 October 2012 16:15 (45 minutes)

Presenter: VAGNONI, Vincenzo Maria (BO)

Session Classification: Session 5

Contribution ID: **33** Type: **not specified**

Evening Lecture: ”SEJITS: embedded specializers to turn patterns-based designs into optimized parallel code” - Timothy G. Mattson (Intel)

Thursday 25 October 2012 18:30 (1 hour)

Session Classification: Session 4

Contribution ID: **34** Type: **not specified**

OpenMP tasks

Thursday 25 October 2012 14:20 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **35** Type: **not specified**

OpenMP Memory model

Thursday 25 October 2012 15:05 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **36** Type: **not specified**

A survey of programming models

Thursday 25 October 2012 16:15 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **37** Type: **not specified**

A survey of programming models

Thursday 25 October 2012 17:00 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 4

Contribution ID: **38** Type: **not specified**

Lecture on low-level CPU profiling

Presenter: Mr JARP, Sverre (CERN)

Contribution ID: **39** Type: **not specified**

Physical design of SW

Presenter: HEGNER, Benedikt (CERN)

Contribution ID: **40** Type: **not specified**

Physical Design Examples/HEP Frameworks

Presenter: HEGNER, Benedikt (CERN)

Contribution ID: **41** Type: **not specified**

Software Development Tools

Presenter: HEGNER, Benedikt (CERN)

Contribution ID: **42** Type: **not specified**

Announcements

Friday 26 October 2012 17:45 (15 minutes)

Presenter: MORANDIN, Mauro (PD)

Session Classification: Session 5

Contribution ID: **43** Type: **not specified**

Evening Lecture: ”Linux on Multicore: challanges and perspective” - Andrea Arcangeli (RedHat)

Contribution ID: **44** Type: **not specified**

Students feedback

Saturday 27 October 2012 08:30 (30 minutes)

Session Classification: Session 6

Contribution ID: **45** Type: **not specified**

Final examination

Saturday 27 October 2012 09:00 (2 hours)

Session Classification: Session 6

Contribution ID: **46** Type: **not specified**

Delivery of certificates of attendance

Saturday 27 October 2012 11:30 (30 minutes)

Session Classification: Session 6

Contribution ID: **47** Type: **not specified**

Shuttle departure (to Forli' railway station)

Saturday 27 October 2012 14:00 (20 minutes)

Session Classification: Session 6

Contribution ID: **48** Type: **not specified**

Evening Lecture: ”Getting it all with C++: Abstraction, Reusability, Performance and Future-Safety”

Presenter: DREPPER, Ulrich (Red Hat)

Contribution ID: **49** Type: **not specified**

Evening Lecture: ”High throughput data trasmission through network links”

Presenter: GALLI, Domenico (BO)

Contribution ID: **50** Type: **not specified**

Evening Lecture: Multicores, GPUs, FPGAs and custom processors for scientific computing: a delicate tradeoff”

Presenter: TRIPICCIONE, Raffaele (FE)

Contribution ID: **51** Type: **not specified**

Evening lecture: Virtualization, Grid, Cloud: Integration Paths for Scientific Computing

Presenter: SALOMONI, Davide (CNAF)

Contribution ID: **52** Type: **not specified**

Evening Lecture: ”How to program a 1000 core processor” (Timothy G. Mattson, Intel Corp.)

Contribution ID: **53** Type: **not specified**

Introduction to OpenCL

Friday 26 October 2012 08:30 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 5

Contribution ID: **54** Type: **not specified**

Introduction to OpenCL

Friday 26 October 2012 09:20 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 5

Contribution ID: **55** Type: **not specified**

Introduction to OpenCL

Friday 26 October 2012 10:30 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 5

Contribution ID: **56** Type: **not specified**

Introduction to OpenCL

Friday 26 October 2012 11:20 (45 minutes)

Presenter: Dr MATTSON, Tim (Intel)

Session Classification: Session 5

Contribution ID: **57** Type: **not specified**

Welcome and opening remarks

Monday 22 October 2012 08:30 (30 minutes)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 1

Contribution ID: **58** Type: **not specified**

Evening lecture: ”Writing better software with the new C++ standard”

Tuesday 23 October 2012 18:30 (1 hour)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 2