Tenth INFN International School on: ”Architectures, tools and methodologies for developing efficient large scale scientific computing applications” ESC18 - Bertinoro (Forlì-Cesena) Italy 21-27 October 2018

Report of Contributions

https://agenda.infn.it/e/16941

Contribution ID: **0** Type: **not specified**

Efficient Memory Management

Tuesday, 23 October 2018 08:30 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 2

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

Efficient Memory Management

Tuesday, 23 October 2018 09:15 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 2

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

Efficient C++ programming

Tuesday, 23 October 2018 10:30 (45 minutes)

Presenter: GIACOMINI, Francesco (CNAF)

Session Classification: Session 2

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

Efficient C++ programming

Tuesday, 23 October 2018 11:15 (45 minutes)

Presenter: GIACOMINI, Francesco (CNAF)

Session Classification: Session 2

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

Consolidation

Tuesday, 23 October 2018 12:00 (1 hour)

Session Classification: Session 2

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

Introduction to parallel computing

Tuesday, 23 October 2018 15:00 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 2

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

Parallel Programming in C++

Tuesday, 23 October 2018 15:45 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 2

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

Parallel Programming with C++

Tuesday, 23 October 2018 17:00 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 2

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

Students lightning presentations

Tuesday, 23 October 2018 17:45 (45 minutes)

Session Classification: Session 2

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

Students feedback

Saturday, 27 October 2018 08:30 (30 minutes)

Session Classification: Session 9

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

Final examination

Saturday, 27 October 2018 09:00 (2 hours)

Session Classification: Session 9

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

Delivery of certificates of attendance

Saturday, 27 October 2018 11:30 (30 minutes)

Session Classification: Session 9

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

Shuttle departure (to Forli' railway station)

Saturday, 27 October 2018 13:30 (20 minutes)

Session Classification: Session 9

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

Welcome and introduction

Monday, 22 October 2018 09:00 (30 minutes)

Presenter: MORANDIN, Mauro (INFN - Padova)

Session Classification: Session 1

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

Computer Architecture evolution and the performance challenge

Monday, 22 October 2018 09:30 (1 hour)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

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

Computer Architecture evolution and the performance challenge

Monday, 22 October 2018 11:00 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 1

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

Hands-on environment checkout

Monday, 22 October 2018 11:45 (45 minutes)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 1

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

Efficient C++ programming

Monday, 22 October 2018 14:00 (45 minutes)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 1

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

Efficient C++ programming

Monday, 22 October 2018 14:45 (45 minutes)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 1

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

Efficient C++ programming

Monday, 22 October 2018 16:00 (45 minutes)

Presenter: Dr GIACOMINI, Francesco (CNAF)

Session Classification: Session 1

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

Consolidation

Monday, 22 October 2018 16:45 (30 minutes)

Session Classification: Session 1

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

Students lightning presentations

Monday, 22 October 2018 17:15 (45 minutes)

Session Classification: Session 1

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

Efficient floating-point computation and vectorization

Thursday, 25 October 2018 08:30 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 4

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

Efficient floating-point computation and vectorization

Thursday, 25 October 2018 09:15 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 4

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

Efficient floating-point computation and vectorization

Thursday, 25 October 2018 10:30 (45 minutes)

Presenter: INNOCENTE, Vincenzo (CERN)

Session Classification: Session 4

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

Consolidation

Thursday, 25 October 2018 11:15 (1 hour)

Session Classification: Session 4

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

Cooperating GPU threads: Shared memory and Synchronization

Thursday, 25 October 2018 13:45 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 4

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

Cooperating GPU threads: Shared memory and Synchronization

Thursday, 25 October 2018 14:30 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 4

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

Consolidation

Thursday, 25 October 2018 15:15 (1 hour)

Session Classification: Session 4

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

Consolidation

Thursday, 25 October 2018 16:45 (1h 15m)

Session Classification: Session 4

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

Evening lecture - Quantum computers and quantum computing: a breakthrough in information processing and in machines programming

Thursday, 25 October 2018 18:00 (1 hour)

We are at a turning point in quantum computing. The disciplines of quantum mechanics and information science have reached a level of maturity that allows us to build the first quantum computers and calculate some algorithms.This radically new kind of computing holds open the possibility of solving some problems that are now and perhaps always will be intractable for "classical"computers.

In this talk we'll describe the basics of the technology from industrial point of view and show where we are in the timeline toward reaching quantum advantage: the point where quantum computing shows demonstrable and significant advantage over classical computers and algorithms.

Presenter: GROSSI, Michele (IBM)

Session Classification: Session 4

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

Efficient C++ programming

Wednesday, 24 October 2018 08:30 (45 minutes)

Presenter: GIACOMINI, Francesco (CNAF)

Session Classification: Session 3

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

Efficient C++ programming

Wednesday, 24 October 2018 09:15 (45 minutes)

Presenter: GIACOMINI, Francesco (CNAF)

Session Classification: Session 3

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

Introduction to Intel Threading Building Blocks

Wednesday, 24 October 2018 10:30 (1h 30m)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 3

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

Consolidation

Wednesday, 24 October 2018 12:00 (1 hour)

Session Classification: Session 3

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

Introduction to GPU Programming using CUDA

Wednesday, 24 October 2018 14:30 (1h 15m)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 3

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

Introduction to GPU Programming using CUDA

Wednesday, 24 October 2018 16:15 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Session 3

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

Consolidation

Wednesday, 24 October 2018 17:00 (1h 30m)

Session Classification: Session 3

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

GPUs management and streams

Friday, 26 October 2018 09:00 (1 hour)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Friday

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

Programming Clusters with MPI

Friday, 26 October 2018 10:30 (45 minutes)

Presenter: Dr PANTALEO, Felice (CERN)

Session Classification: Friday

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

Cluster Computing with MPI

Friday, 26 October 2018 11:15 (45 minutes)

Session Classification: Friday

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

Consolidation

Friday, 26 October 2018 12:00 (1 hour)

Session Classification: Friday

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

Cluster Computing with MPI

Friday, 26 October 2018 14:30 (1h 15m)

Session Classification: Friday

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

Consolidation

Friday, 26 October 2018 15:45 (45 minutes)

Session Classification: Friday

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

Information

Presenter: MORANDIN, Mauro (PD)

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

Consolidation

Friday, 26 October 2018 17:00 (1 hour)

Session Classification: Friday

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

Surviving the Red Queen's Race: A guide for the perplexed programmer

The Red Queen's race is an important hypothesis in evolutionary biology raised to explain the impact of competition on the rate of evolution. I submit that it is an excellent analogy for the hardware chaos we are now facing. The question is, what can programmers do to survive as the hardware literally changes underneath them? In this talk we will look at trends in hardware and explore some of the approaches being used by software developers to cope.

Presenter: Dr MATTSON, Tim (Intel)

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

Consolidation

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

Vectorization

Presenter: INNOCENTE, Vincenzo (CERN)

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

Consolidation

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

GPUs and the Heterogeneous programming problem

Presenter: Dr MATTSON, Tim (Intel)

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

Consolidation

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

Floating point computing efficiency

Presenter: INNOCENTE, Vincenzo (CERN)

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

GPU programming with OpenCL: Core Ideas and the host program

Presenter: Dr MATTSON, Tim (Intel)