

Latin American Introductory School on Parallel Programming and Parallel Architecture for High Performance Computing | (smr 3187)

Monday, 12 February 2018

- 09:30 - 18:30 WEEK 1: MONDAY - DAY 1
- 09:30 **Registration of participants and administrative issues** 1h0'
 - 10:30 **Introduction to HPC** 1h0'
Speaker: Ivan Girotto (ICTP, Trieste)
 - 11:30 **Coffee break** 30'
 - 12:00 **Foundation of Modern Computer Architecture** 1h0'
Speaker: Ivan Girotto (ICTP, Trieste)
 - 13:00 **Lunch break** 1h0'
 - 14:00 **Measuring Hardware Performance** 2h0'
Speaker: Ivan Girotto (ICTP, Trieste)
 - 16:00 **Coffee break** 30'
 - 16:30 **Floating point Math (including Lab)** 2h0'
Speaker: Richard Berger (Temple University, Philadelphia)



Tuesday, 13 February 2018

- 09:30 - 18:30 WEEK 1: TUESDAY - DAY 2
- 09:30 **From Source Code to Executable** 1h30'
Speaker: Ivan Girotto (ICTP, Trieste)
 - 11:00 **Coffee break** 30'
 - 11:30 **Building SW Packages Overview: make & cmake** 1h30'
Speaker: J. Manuel Solano Altamirano (Benemerita Universidad Autonoma, Puebla)
 - 13:00 **Lunch break** 1h0'
 - 14:00 **Lab-session: Practicing on Code Compilation** 2h0'
Speaker: J. Manuel Solano Altamirano (Benemerita Universidad Autonoma, Puebla)
 - 16:00 **Coffee break** 30'
 - 16:30 **Lab-session: Compiler Options and Mixing Languages** 2h0'
Speaker: Ivan Girotto (ICTP, Trieste)



Wednesday, 14 February 2018

- 09:30 - 18:30 WEEK 1: WEDNESDAY - DAY 3
- 09:30 **Basic Principles of Parallelism** 1h30'
Speaker: Gavin Pringle (EPCC, Edinburgh)
 - 11:00 **Coffee break** 30'
 - 11:30 **Introduction to OpenMP** 1h30'
Speaker: Richard Berger (Temple University, Philadelphia)
 - 13:00 **Lunch break** 1h0'
 - 14:00 **Lab-session: OpenMP Programming** 2h0'
Speaker: Richard Berger (Temple University, Philadelphia)
 - 16:00 **Coffee break** 30'
 - 16:30 **Lab-session: OpenMP Programming** 2h0'
Speaker: Richard Berger (Temple University, Philadelphia)



Thursday, 15 February 2018

- 09:30 - 18:30 WEEK 1: THURSDAY - DAY 4
- 09:30 **Practical MPI** 1h30'
Speaker: Gavin Pringle (EPCC, Edinburgh)

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- 11:00 **Coffee break 30'**
- 11:30 **Practical MPI 1h30'**
Speaker: Gavin Pringle (EPCC, Edinburgh)
- 13:00 **Lunch break 1h0'**
- 14:00 **Lab-session: Practicing MPI 2h0'**
Speaker: Gavin Pringle (EPCC, Edinburgh)
- 16:00 **Coffee break 30'**
- 16:30 **Lab-session: Practicing MPI 2h0'**
Speaker: Gavin Pringle (EPCC, Edinburgh)

Friday, 16 February 2018

- 09:30 - 18:30 WEEK 1: FRIDAY - DAY 5
- 09:30 **Overview of Common Strategies for Parallelization 1h30'**
Speaker: Ivan Girotto (ICTP, Trieste)
- 11:00 **Coffee break 30'**
- 11:30 **Tasking Programming Model 1h30'**
Speaker: Jimmy Aguilar Mena (Barcelona Supercomputing Center)
- 13:00 **Lunch break 1h0'**
- 14:00 **Lab-session: Practicing MPI 2h0'**
Speaker: Ivan Girotto (ICTP, Trieste)
- 16:00 **Coffee break 30'**
- 16:30 **Lab-session: Tasking Programming Model 2h0'**
Speaker: Jimmy Aguilar Mena (Barcelona Supercomputing Center)

Monday, 19 February 2018

- 09:30 - 18:30 WEEK 2: MONDAY - DAY 6
- 09:30 **Best Practise of Parallel SW Development: LAMMPS 1h30'**
Speaker: Richard Berger (Temple University, Philadelphia)
- 11:00 **Coffee break 30'**
- 11:30 **Parallelising Wave Front Simulations 45'**
Speaker: Gavin Pringle (EPCC, Edinburgh)
- 12:15 **Exponential integrators using matrix functions: Krylov subspace methods and Chebyshev expansion — The HPC approach 45'**
Speaker: Marlon Brenes Navarro (Trinity College Dublin)
- 13:00 **Project Presentation and discussion 30'**
- 13:30 **Outside together lunch @ Instituto Nacional de Investigaciones Nucleares (ININ) 2h30'**
- 16:30 **Working on Projects 2h0'**

Tuesday, 20 February 2018

- 09:30 - 18:30 WEEK 2: TUESDAY - DAY 7
- 09:30 **HPC Best Practice: Facility Deployment, Managment and Administration 1h30'**
Speaker: Richard Berger (Temple University, Philadelphia)
- 11:00 **Coffee break 30'**
- 11:30 **Foundations of Parallel I/O 1h30'**
Speaker: Gavin Pringle (EPCC, Edinburgh)
- 13:00 **Lunch break 1h0'**
- 14:00 **Working on Projects 2h0'**
- 16:00 **Coffee break 30'**
- 16:30 **Working on Projects 2h0'**

Wednesday, 21 February 2018

- 09:30 - 18:30 WEEK 2: WEDNESDAY - DAY 8
- 09:30 **Sparse Matrix Computations with common Libraries for HPC 1h30'**
Speaker: Marlon Brenes Navarro (Trinity College Dublin)
- 11:00 **Coffee break 30'**
- 11:30 **Parallel FFTs and the FFTW library 1h30'**

Speaker: Gavin Pringle (EPCC, Edinburgh)

- 13:00 **Lunch break 1h0'**
- 14:00 **Working on Projects 2h0'**
- 16:00 **Coffee break 30'**
- 16:30 **Working on Projects 2h0'**

Thursday, 22 February 2018

09:30 - 18:30

WEEK 2: THURSDAY - DAY 9

- 09:30 **Distributed computing in deal.II, parallel solvers and preconditioners 1h30'**
Speaker: Wolfgang Bangerth (Colorado State University, Fort Collins)
- 11:00 **Coffee break 30'**
- 11:30 **Overview on GPU Accelerators and Programming Paradigms 45'**
Speaker: Ivan Girotto (ICTP, Trieste)
- 12:15 **Future of Programming Paradigms 45'**
Speaker: Jimmy Aguilar Mena (Barcelona Supercomputing Center)
- 13:00 **Lunch break 1h0'**
- 14:00 **Working on Projects 2h0'**
- 16:00 **Coffee break 30'**
- 16:30 **Working on Projects 2h0'**

Friday, 23 February 2018

09:30 - 13:10

WEEK 2: FRIDAY - DAY10

- 09:30 **Modern Scientific SW Development: how to and best practises from the development of the dealII, including future prospectives 1h30'**
Speaker: Wolfgang Bangerth (Colorado State University, Fort Collins)
- 11:00 **Coffee break 30'**
- 11:30 **Projects Presentation 1h30'**
- 13:00 **Closing remarks 10'**