Einstein Toolkit EU School and Workshop

June 13-17 2016

University of Trento (Italy)

Schedule is tentative

Both school and workshop will be held in room A210 ("Polo Ferrari")[1]

	Monday June 13	Tuesday June 14	Wednesday June 15	Thursday June 16	Friday June 17
9-12	Introduction to Numerical Methods (**Hawke**)	Einstein Toolkit Part 1 (**Korobkin**)	Postprocessing (**Kastaun**)	ET Developers Workshop	ET Developers Workshop
12-14	LUNCH				
14-18	Numerical Methods for relativistic HD/MHD (**Font** & **Dumbser**)	Einstein Toolkit Part 2 (**Hinder**)	Scientific visualisation (**Mösta** & **Miller**)	ET Developers Workshop	ET Developers Workshop

List of lecturers and affiliations:

1. Michael Dumbser (University of Trento, Italy)
2. Toni Font (University of Valencia, Spain)
3. Ian Hawke (University of Southampton, UK)
4. Ian Hinder (Albert Einstein Institute, Germany)
5. Jonah Miller (Perimeter Institute, Canada)
6. Philipp Moesta (University of California Berkeley, USA)
7. Wolfgang Kastaun (University of Trento, Italy)
8. Oleg Korobkin (Stockholm University, Sweden)

Organizers:

1. Eloisa Bentivegna (University of Catania, Italy)
2. Riccardo Ciolfi (University of Trento, Italy)
3. Bruno Giacomazzo (University of Trento, Italy)
4. Frank Loeffler (Louisiana State University, USA)

[1] Povo 1 on this map: http://www.physics.unitn.it/en/15/how-to-reach-us

The Einstein Toolkit (ET, www.einsteintoolkit.org) is a publicly available framework used by several numerical relativity groups in the world. Its application ranges from cosmology to high-energy astrophysics (e.g., gravitational wave sources, supernova explosions, gamma-ray bursts). Even if mainly maintained in the USA, several research groups in EU contribute to and use it on a regular basis. After the first European ET workshop held in Stockholm in 2015[2], we decided to continue with the idea of hosting a yearly workshop also in Europe. A school for new users of the ET will also precede this time the workshop. Below we list some more details about the school and workshop.

Details of the School Program (Mon – Wed)
(Max 20 students)

The school aim is to introduce students and postdocs to the Einstein Toolkit and in particular to its general relativistic magnetohydrodynamic (GRMHD) code GRHydro. We have invited 8 very well known lecturers from several institutions around the world. The school is organized in 3 full days with the following tentative program:

1. **Monday**: the students will get an overview of the theory behind GRHD/GRMHD codes, including: 3+1 formulation of Einstein equations, Valencia formulation for GRHD/GRMHD, finite volume and finite element methods.
2. **Tuesday**: the students will learn how to download and install the Einstein Toolkit. They will also learn how to run some simple simulations with GRHydro (e.g., neutron star oscillations, neutron star collapse to black hole, binary neutron star merger).
3. **Wednesday**: the students will learn how to visualize the results of their simulations using publicly available tools such as VisIt and yt. They will also learn how to use some publicly available post-processing scripts to compute some useful quantities from their simulations.

Details of the Workshop Program (Thu – Fri)
(Max 40 participants)

The workshop aim is to increase the collaboration within the EU and between EU and USA researchers on the development of the Einstein Toolkit. All the students that have followed the school are also more than welcome to attend the workshop in order to interact with ET developers and participate to the discussion on current and future developments of the toolkit.
The workshop is organized in two full days with the following tentative program (in preparation):

1. **Thursday**: update on the status of the Einstein Toolkit and discussion on current issues.
2. **Friday**: future developments of the Einstein Toolkit.

[2] http://agenda.albanova.se/conferenceDisplay.py?confId=4936