Spurzem, Rainer, Prof. Dr.

National Astronomical Observatories of China
Chinese Academy of Sciences *and*

Faculty of Physics and Astronomy,
Univ. of Heidelberg, Germany *and*

International Center for Computational Science
(ICCS) http://iccs.lbl.gov

Many Core Accelerated (GPU) Supercomputing in China and elsewhere - black holes and gravitational waves from galactic nuclei

Abstract

Computational Astrophysics and some physical applications on large scale GPU clusters at Chinese Academy of Sciences and National Astronomical Observatories in Beijing and at our other sites in the U.S. and Germany are reviewed. We are currently setting up a network of GPU clusters on three continents. Some of our particle based algorithms scale well using hundreds to thousands of GPUs for one single application in a parallel message passing environment. As an example application we present simulations of dense star clusters in galactic nuclei containing supermassive black holes, emitting gravitational waves. Our simulation proceeds to the complete relativistic merger of the black holes. We discuss the signal produced by our simulated black holes for current and future gravitational wave instruments.

Biosketch

Rainer Spurzem has completed his Ph.D. at the University of Göttingen (Germany) in 1988 with a thesis on stellar systems around supermassive black holes. During the 90s he worked as a researcher and teaching assistant at the University of Kiel (Germany), bringing GRAPE special purpose computers for astrophysical N-body simulations to Europe. After postdocs and visiting fellowships in the UK, Japan and the U.S. he moved to the University of Heidelberg, Germany in 1996, where he obtained an honorary professorship in 2003. He was awarded with the GRACE project grant funded by Volkswagen foundation in Germany, which designed the GRACE supercomputer (using GRAPE and FPGA). Since 2009 he is leading the Silk Road Project as a visiting professor of Chinese Academy of Sciences in Beijing, at the National Astronomical Observatories of China.