CENTER FOR COMPUTATION & TECHNOLOGY
Interdisciplinary | Innovative | Inventive

LOUISIANA STATE UNIVERSITY

Events

Current Events
Lectures▼
Events Archive▼

Special Guest Lectures

Towards absorbing outer boundaries in General Relativity

Olivier Sarbach, Universidad Michoacana de San Nicolas de Hidalgo

Johnston Hall 338
March 15, 2007 - 12:15 pm

Abstract:
A common approach for the numerical simulation of wave propagation on a spatially unbounded domain is to truncate the domain via an artificial boundary, thus forming a finite computational domain with outer boundary. In order to obtain a unique Cauchy evolution, it is necessary to impose boundary conditions which should yield a well posed problem and, ideally, be completely transparent to the physical problem on the unbounded domain. Short of achieving the ideal, one can try to develop so-called absorbing boundary conditions which form a well posed problem and insure that only a very small amount of spurious radiation is reflected from the outer boundary into the computational domain. There has been a substantial amount of work on the construction of absorbing boundary conditions for wave problems in acoustics, electromagnetism, meteorology, and solid geophysics. In this talk, I discuss the construction of absorbing boundary conditions in General Relativity. In particular, a hierarchy of boundary conditions which perfectly absorb linearized gravitational waves up to arbitrary high angular momentum number L is derived. Boundary conditions which take into account first order correction terms from backscatter off the curvature are also presented.

Speaker's Bio:
In 2000, Sarbach presented his Doctoral Thesis in Natural Sciences at the University of Zurich, Switzerland (receiving his Dr. sc. nat.). Prior to that, in 1997, he presented his Diploma Thesis in Theoretical Physics at the Swiss Federal Institute of Technology Zurich (receiving his Dipl. Phys. ETH), and in 1991 he took his Matriculation Examination, Natural Sciences (Matura, Typus C) at Winterthur, Switzerland. Olivier Sarbach is currently an Assistant Professor at Universidad Michoacana, Morelia, Mexico, in Methods of Mathematical Physics, Quantum Mechanics. Sarbach was a postdoc at Penn State, LSU, Caltech and UCSD.

Refreshments will be served.
This lecture has a reception.

Center for Computation & Technology
2003 Digital Media Center • Telephone: +1 225/578-5890 • Fax: +1 225/578-8957