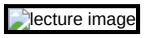

Visions for Quantitative Biology Lecture Series

Elliptic PDEs and an Introduction to Related Numerical Methods

Carsten Schneemann
Numerical Relativity Group, Albert Einstein Institute
Johnston Hall 338
February 16, 2006 - 12:15 pm

Abstract:
Elliptic equations arise in many contexts of numerical relativity: The construction of initial data sets, constrained evolution schemes, and elliptic gauge conditions, to name just a few. The numerical methods used to solve the associated discrete equations are very different from common time evolution schemes in both algorithmic structure and computational complexity. In particular, multilevel schemes in conjunction with Krylov subspace accelerators are among the most powerful solution algorithms for implicit systems and promise to reduce the computing time needed to solve such a system to only a few times that of an explicit evolution step. In this talk Schneeman will give a brief overview of some numerical methods for elliptic partial differential equations and then try to outline the preliminary working plan for my visit to CCT.

Speaker's Bio:
Carsten Schneemann studied physics and mathematics at the Universities of Stuttgart and Goettingen, Germany. He wrote his Diploma thesis at the Albert-Einstein-Institute in Potsdam on the construction and characterization of hyperboloidal initial data for Einstein's field equations. Currently he is working towards a PhD in the numerical relativity group at the AEI. During his university time he also served as a student representative on both faculty and university level boards for extended periods.

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