MEGHÍVÓ

Az ELTE Matematikai Intézetének
RENDKÍVÜLI
intézeti szemináriumára

az MTA-ELTE Numerikus Analízis és Nagy Hálózatok Kutatócsoport és
a Farkas Miklós Alkalmazott Analízis Szeminárium támogatásával.

Előadók:

Randall J. LeVeque
Boeing Professor of Applied Mathematics
University of Washington

és

Marsha Berger
Courant Institute, NYU

Helyszín: Déli épület –1-820 Hajós terem
Időpont: 2017. július 31.- hétfő - 10.00 órai kezdet

Az előadások:

1. Előadás 10:00 órától – 11:00 óráig : Adjoint Error Estimation for Adaptive Refinement of Hyperbolic PDEs

Előadó: Randall J. LeVeque, a SIAM Board of Trustees tagja valamint a SIAM Journals Committee elnöke

Absztrakt:

Time-dependent hyperbolic partial differential equations can be efficiently solved using adaptive mesh refinement, with a hierarchy of finer grid patches in regions where the solution is discontinuous or rapidly varying. These patches can be adjusted every few time steps to follow propagating waves. For many problems the primary interest is in tracking waves that reach one target location, perhaps after multiple reflections. The solution to an adjoint equation solved backward in time from the target location can be used to identify the regions that require refinement. These adjoint methods are incorporated in the Clawpack software for general hyperbolic problems and have been used in the GeoClaw software to track tsunami waves in the ocean that will reach a particular community of interest.

2. előadás 11:15 órától – 12:15 óráig : Modeling and Simulation of Asteroid-Generated Tsunamis

Előadó: Marsha Berger Courant Institute, NYU

Absztrakt:

In 2013, an uncharted asteroid exploded in the atmosphere over Chelyabinsk, causing damage for a radius of 20 kilometers. We examine the question of what would happen if an asteroid burst over water instead of land. Could it generate a tsunami that would cause widespread damage far away?

We present numerical simulations using the GeoClaw software and the shallow water equations in a variety of settings. We have a model problem with an explicit solution that explains the phenomena found in the computations. Finally, we discuss whether compressibility and dispersion are important effects that should be included, and show results using the linearized Euler equations that begin to address this.