

SPEAKER: David Smith, University of Cincinnati

TITLE:

Augmented eigenfunctions: a new spectral object appearing in the integral representation of the solution of linear initial-boundary value problems.

ABSTRACT:

We study initial-boundary value problems for linear, constant-coefficient partial differential equations of arbitrary order, on a finite or semi-infinite domain, with arbitrary boundary conditions. It has been shown that the recent Unified Transform Method of Fokas can be used to solve all such classically well-posed problems. The solution thus obtained is expressed as an integral, which represents a new kind of spectral transform. We compare the new method, and its solution representation, with classical Fourier transform techniques, and their resulting solution representations. In doing so, we discover a new species of spectral object, encoded by the spectral transforms of the Unified Method.