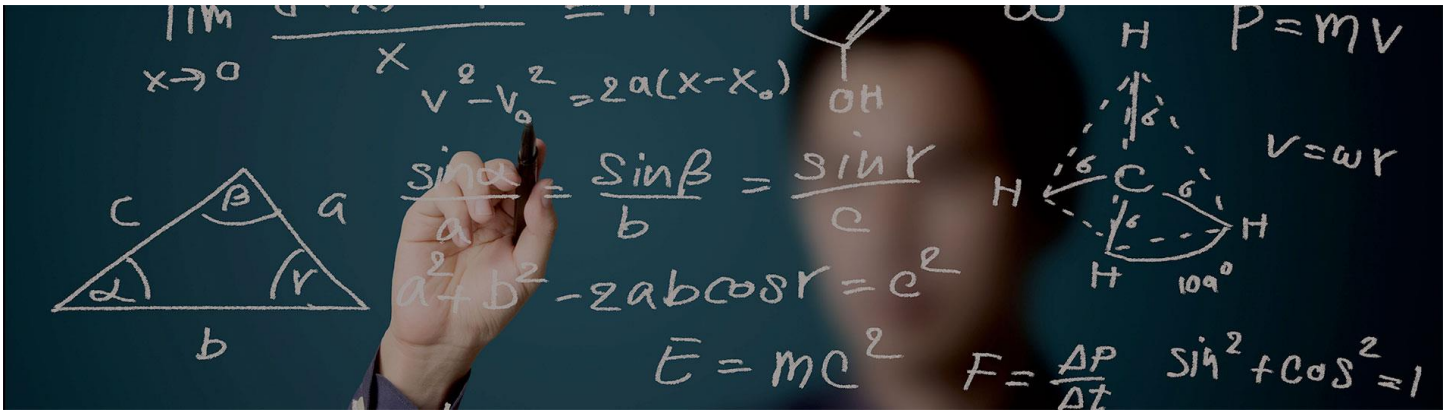

FALL 2018

RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

"High Order Mimetic Difference Operators"

Abstract: Mimetic Difference Operators satisfy a discrete analog of the divergence theorem and they are used to create/design conservative/reliable numerical representations to continuous models. We will present mimetic versions of the divergence and gradient operators which exhibit high order accuracy at the grid interior as well as at the boundaries. As a case of study, we will show fourth order operators Divergence and Gradient in a one-dimensional staggered grid. Mimetic conditions on discrete operators are stated using matrix analysis and the overall high order of accuracy determines the bandwidth of the matrices. This contributes to a marked clarity with respect to earlier approaches of construction. As test cases, we will solve 2-D elliptic equations with full tensor coefficients. Additionally, applications to elastic wave propagation under free surface and shear rupture boundary conditions will be given.

Jose Castillo

(San Diego State University)

Monday, November 5, 2018

4-5pm

Amos Eaton 214

Host: Bill Henshaw

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge