1116-76-2136 **Chris Curtis***, Department of Mathematics & Statistics, 5500 Campanille Dr., San Diego, CA 92182, and **Katie Oliveras**, **Sam Shen** and **Theresa Morrison**. *Nonlinear Waves Over Currents.*

In this talk, we will discuss several different scenarios of nonlinear waves propagating in fluids with background currents. In the first part of the talk, we will look at three dimensional waves propagating over a current moving over varying bathymetry. A higher-order forced Benney-Luke equation is derived. A key result is that while upstream soliton formation is still seen, it is markedly different in character than what one sees via the forced Kadomtsev-Petviashvilli equation.

In the second part of the talk, we look at density stratified fluids with constant shear currents in each layer. We show parameter regions exist in which Kelvin-Helmholtz instabilities are suppressed. In these regions, due to strong differences in the shear strengths, relatively high amplitude and high energy dispersive shock waves appear at the interface between the layers. Both results show strong nonlinear phenomena appear in the presence of currents, and that simple nonlinear models can be readily expanded upon to model physically interesting fluid regimes. (Received September 21, 2015)