

# MATHEMATICS COLLOQUIUM

## *Stability of Solitary Waves*

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**Abstract:** Consider a body of water of finite depth under the influence of gravity, bounded below by a flat, impermeable surface. If viscous and surface tension effects are ignored, and assuming that the flow is incompressible and irrotational, the fluid motion is governed by the Euler equations together with suitable boundary conditions on the rigid surfaces and on the air-water interface. However, in many practical engineering situations, the full Euler equations appear far more complex than are necessary for the modeling purposes at hand. Consequently, quite a few other approximate models have been proposed for usage when certain restricted physical regimes are satisfied. A regime that arises in practical situations is that of waves in a channel of approximately constant depth  $h$  that are uniform across the channel, and which are of small amplitude and long wavelength, and such that the associated nonlinear and dispersive effects are balanced.

Several of those models possess a special class of solutions known as solitary-wave solutions. Solitary waves are localized nonlinear waves with remarkable stability properties, preserving their identity even after undergoing complex interactions. In consequence of this, and because the issue is interesting in its own right, the topic of stability of solitary-wave solutions has attracted considerable attention during the last three decades.

In this talk, stability of solitary-wave solutions to some of these models will be discussed. Some of the results are joint works with J. Albert, J. Bona, M. Chen, Y. Liu and S. Sun.

Date: Monday, March 19, 2007  
Time: 3:00pm-4:00pm  
Place: MAGC 1.318

Refreshments will be served at 2:50pm.

For further information or for special accommodations, contact Dr. Karen Yagdjian at 381-2145, via email at [yagdjian@utpa.edu](mailto:yagdjian@utpa.edu), or visit [www.math.panam.edu/colloquia.html](http://www.math.panam.edu/colloquia.html)