1035-35-2001 **Allen Parker*** (allen.parker@ncl.ac.uk), School of Mechanical & Systems Engineering, Newcastle University, Newcastle upon Tyne, NE1 7RU, England. *Multicusped solitons of the Camassa-Holm equation.*

The eponymous Camassa-Holm (CH) equation,

$$u_t + 2\kappa^2 u_x + 3uu_x - u_{xxt} = 2u_x u_{xx} + uu_{xxx}, \qquad \kappa > 0,$$

has proved to be of considerable and enduring interest since it resurfaced as a model for shallow-water waves. Over the last decade or so, the equation has attracted a substantial literature, much of which has been devoted to establishing its integrable credentials. Apart from the familiar classical solitons, the CH equation admits nonanalytic 'peaked' solitons: the so-called *peakons* and *cuspons*. The *peakon* solitary wave possesses a peak that is a 'corner' (a finite discontinuity in the slope), whilst the *cuspon* has infinite and opposite slope at its apex (a cusp).

Yet despite their being peicewise analytic, cuspons interact in typical soliton fashion *both* amongst themselves *and*, remarkably, with their smooth soliton counterparts. In this talk, explicit multiple cuspon-soliton solutions of the CH equation are reported in parametric form. The dynamics of the two-wave interactions, in particular, are discussed and some unanswered questions concerning these waveforms are addressed. Examples of two and three cuspon-soliton solutions are presented illustrating the different parameter regimes. (Received September 21, 2007)