

Solitary waves were first observed by John Scott Russell in 1834 as free surface waves in an Edinburgh-Glasgow canal. They are described by the famous Korteweg - de Vries (KdV) equation (1895), the first nonlinear PDE which was shown to be integrable by the Inverse Scattering Transform (IST) by Gardner, Green, Kruskal and Miura (1967, 1974). Similar internal waves, supported by density gradients, are ubiquitous in oceanic coastal areas. The KdV-type integrable and near-integrable long wave weakly-nonlinear models able to describe main features of these waves in realistic oceanic settings were gradually developed by many researchers beginning with the works of Benney (1966) and Benjamin (1966). The models became the basic paradigm for interpretation of oceanic observations and modelling results, largely due to the works of Grimshaw (1981, 1985). In this talk I will overview some recent developments related to the modelling of long weakly-nonlinear surface and internal waves. My main interests in this area include generalisations describing waves with curvilinear fronts, and the effects of rotation and background shear flow. In particular, I will overview the results concerning a version of the Kadomtsev-Petviashvili (KP) equation for surface gravity waves related to elliptic-cylindrical geometry, a system of coupled Ostrovsky equations derived for strongly interacting internal waves in the presence of background rotation and shear flow, and 2+1-dimensional cylindrical Korteweg-de Vries (cKdV)-type model describing ring waves in stratified fluids in the presence of a depth-dependent parallel shear flow.