Analysis Seminar

Title: A new convergence analysis of the particle method for the Camassa-Holm equation

Speaker: Richard Smith

Date: Tue 7th December 2021 at 3:00PM

Location: Seminar Room SCN 1.25

Abstract: The Camassa-Holm equation (CH) can be used to model waves in shallow water. Solutions of this equation can be found by applying a particle method, which involves substituting linear combinations of 'peakons' (solitons marked by a sharp peak where there is a discontinuity in the derivative) into a weak form of the equation, solving the resulting ODE system and then demonstrating convergence of these linear combinations, subject to an initial condition. Chertock, Liu and Pendleton showed that convergence to a weak solution of CH can be demonstrated by exploiting compactness properties of functions having bounded variation. We show that convergence can be obtained instead by analysing the behaviour of the underlying Radon measures with respect to a particular w^*-lower semicontinous metric. The approach can be applied to a range of PDEs.

This is joint work with Lennon Ó Náraigh and Khang Ee Pang (UCD).

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