Analysis Seminar

Title: Convergence Analysis of the Geometric Thin-Film Equation

Speaker: R. Smith

Date: Tue 6th December 2022 at 3:00PM

Location: Seminar Room SCN 1.25

Abstract: The Geometric Thin-Film equation is a mathematical model of droplet spreading in the long-wave limit, which includes a regularization of the contact-line singularity. First, we show that, given initial positive Radon data $\mu \in \mathcal{M}()$, the model admits a weak solution that is $\frac{1}{2}$-Hólder continuous for all time $t \in^{+}$. This solution is based on the push-forward of a function $c :^{+} \times \rightarrow$ that satisfies a system of ODEs. The function c is shown to be the limit of a sequence of 'particle solutions', which take as their initial data finite weighted sums of Dirac measures that approximate μ. Establishing the convergence is non-trivial because the ODE system's interaction kernel possesses singularities. Second, we show that, when restricted to this class of solutions induced in this way, the solution is unique.

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

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