

Institute for Mathematics and its Applications
2011 Seminar Series: 2
University of Wollongong

Title: A crystal finger with surface tension: a gentle example of exponential asymptotics

Speaker: Scott McCue (Queensland University of Technology)

Time and Date: 1:30pm, Tuesday April 12, 2011

Location: Room 24.101

Abstract: Ill-posed curvature flows normally lead to blow-up in finite time. One known exact solution that exists for all time is a travelling wave that can be thought of as a single crystal needle or viscous finger (the ‘grim reaper’). With the addition of surface-tension-type regularisation, it happens that this travelling wave solution no longer exists, with the nonexistence caused by exponentially small terms (that appear beyond all orders of the power series expansion) being ‘switched on’ across a Stokes line. A simple linear model is used to illustrate the main ideas behind the research in this area.