

**Joachim Escher**

**Focus session 5: Regularity of free boundaries**

*Regularity of rotational travelling water waves*

Several recent results on the regularity of streamlines beneath a rotational travelling wave, along with the wave profile itself, will be presented. A common assumption in all models to be discussed is the absence of stagnation points.

**Focus session 9: Analysis of fluidic interfaces**

*Existence and stability of weak solutions for a degenerate parabolic system modelling two-phase flows in porous media*

Of concern is the global existence of nonnegative weak solutions to a degenerate parabolic system which models the interaction of two thin fluid films in a porous medium. Furthermore it is established that these weak solutions converge at an exponential rate towards flat equilibria.

This is a joint work with Ph. Laurencot (Toulouse) and B. Matioc (Vienna).