OLIVIER LEY, Université François Rabelais, Tours, France

Some uniqueness results for the motion by mean curvature of entire graphs

In 1991, Ecker and Huisken proved that, for any locally Lipschitz continuous initial data $u_0\colon \mathbb{R}^n \to \mathbb{R}$, there exists a smooth solution (for $t > 0$) to the mean curvature equation for graphs

$$\frac{\partial u}{\partial t} - \Delta u + \frac{\langle D^2 u Du, Du\rangle}{1 + |Du|^2} = 0 \quad \text{in } \mathbb{R}^n \times (0, \infty),$$
$$u(x, 0) = u_0(x) \quad \text{in } \mathbb{R}^n.$$

We are concerned with the issue of uniqueness. In the existence result, the intriguing point is that no assumption is made on the growth of u_0 at infinity and therefore the solution u itself can have an arbitrary growth. We use different approaches including geometrical and analytical tools to provide uniqueness results in the following cases:

(i) when u_0 is convex (or more generally "convex at infinity"),

(ii) when $n = 1$,

(iii) when u_0 is radial, or

(iv) when assuming some polynomial growth conditions.

Joint works with G. Barles, S. Biton, M. Bourgoing, P. Cardaliaguet and E. Chasseigne.