Monotone heteroclinic solutions to semilinear PDEs in cylinders and applications

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In this talk we present an existence result for strictly monotone heteroclinic type solutions of semilinear elliptic equations in cylinders. The motivation of this construction is twofold: first, it gives an example of a steady solution for the 2D Euler equations without stagnation points which is not a shear flow. Second, it implies the existence of an entire bounded solution of a semilinear equation without critical points which is not one-dimensional in $\mathbb{R}^2$.
Work in collaboration with David Ruiz (Universidad de Granada).