"Front propagation in the presence of obstacles"

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In this talk I will discuss the effect of geometric obstacles on the propagation of fronts. Two types of fronts are considered. One is a transition layer in a bistable reaction diffusion equation. The other is a curvature-dependent motion of plane curves. Both types of fronts are closely related. In the first part, I will present my joint work with Henri Berestycki and François Hamel. I will then discuss the curvature-dependent motion of plane curves through an infinite channel with saw-toothed boundaries. For this second topic, I will first recall my joint work with Ken-Ichi Nakamura and Bendong Lou (2006, 2013), which deal with domains with mildly undulating boundaries. I will then discuss my ongoing joint work with Ryunosuke Mori, which deals with domains whose boundaries have steeper bumps. In such domains, a new type of phenomenon, which we call “obstacle-induced propagation”, can be observed.