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Maria G. Westdickenberg* (maria@math.gatech.edu), School of Mathematics, Georgia Institute of Technology, 686 Cherry Street, Atlanta, GA 30332. *Sharp Interface Limits in the Study of Rare Events.*

Thermal or stochastic effects are prevalent in physical, chemical, and biological systems. Particularly in small systems, noise can overpower the deterministic dynamics and lead to “rare events” that would never be seen in the absence of noise. One example is the thermally-driven switching of the magnetization in small memory elements.

Wentzell-Freidlin large deviation theory analyzes rare events by way of a deterministic variational problem: minimization of the so-called large deviation action functional. Although first developed in the ODE setting, the theory generalizes naturally to systems with spatial dependence. We discuss the Allen-Cahn action functional and its sharp interface limit, including the issue of interfaces with nontrivial multiplicity.

This talk includes joint work with Robert V. Kohn, Felix Otto, Yoshihiro Tonegawa, and Eric Vanden-Eijnden. (Received August 19, 2007)