Ferromagnetic shape memory alloys - fundamentals and miniaturization

Ferromagnetic shape memory alloys are an exciting new class of smart functional materials, that can yield magnetically switchable strains of several percent at constant temperatures and frequencies from quasi-static up to some kilohertz. Although highly promising in a broad range of areas, including biomedical actuation, the underlying physical foundations are still poorly understood - in particular when miniaturized as thin magnetically switchable membranes. The present contribution will review the current understanding, discuss the materials challenges and report about recent progress in coping with them.