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### **Vortex Domains in Ferroelectric Nano-Structures**

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Recently the study of submicron-diameter ferroelectric disks and squares and rectangles fabricated from films of ca. 100-300 nm thick have revealed usual domain patterns, qualitatively different from the stripe domains commonly studied in macroscopic specimens in the past. These include doughnut-shaped domains, four-fold vertex closure domains, and fractal domains. The static configurations offer a variety of puzzles, and the structures differ from those in magnetic vortex domains, presumably due to the much larger anisotropy in ferroelectrics, which generally prohibits true vortex configurations with polarization forced out of plane. The dynamics also differ qualitatively from early studies: For decades ferroelectrics were thought to be highly Ising-like, but recent data and theoretical simulations favor Bloch walls and more Heisenberg-like kinetics. This talk will include data from Alina Schilling and Marty Gregg in Belfast, Marin Alexe in Halle, and modeling from Hlinka and Marton in Prague and Bellaiche and Prosandeev in Arkansas.