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Nanoscale Morphology Evolution Using Ion Beams

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Invited talk: Focused and unfocused ion beam irradiation of a solid changes the surface morphology by sputter erosion, ballistic mass redistribution, and material relaxation processes. Their interplay can result in self-organized nanoscale corrugation, dot, or hole patterns with periodicities down to 7 nm; self-sharpening high-sloped shock fronts that propagate instead of dissipating and evolve to the same slope from a range of initial slopes; and controlled closure of nanopores with applications to single biomolecule detection. Current understanding of these phenomena will be reviewed from an experimental and a theoretical perspective.