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Motions of atoms on a germanium surface showing the fundamental excitations from crystalline order that bring about transformations of solids. The interstitial-like (lower left) and vacancy-like (middle right) excitations correspond to those responsible for mass trans-

port, many phase transitions, and catalysis. This atomic-scale view of such dynamic phenomena is made possible by the tunneling microscope. See page 490. [Illustration: Jeff Knight]



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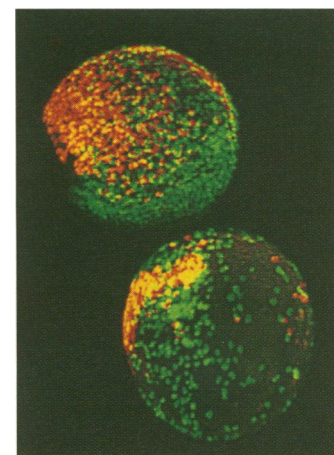
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