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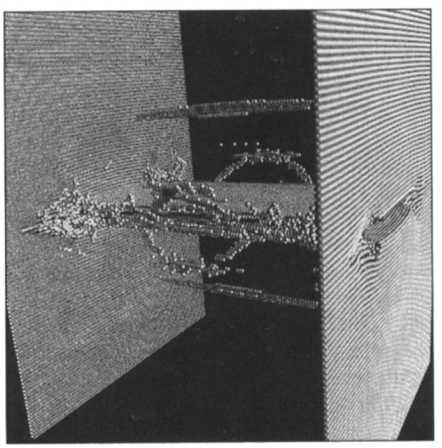

ON THE COVER: Molecular-dynamics simulation of crack blunting by dislocation emission in copper under tensile loading using a realistic, embedded-atom interatomic potential. An atomistically sharp crack (artificially prepared) becomes an elliptical cylinder as the system is strained vertically to 4.7% (rate=10^9 s^{-1}). Atoms are visualized in order of their potential energy (perfect bulk atoms are invisible): Crack blunting dislocation loops emitted in the {111} planes and jogging dislocations emitted at the junction of the crack front with the free surface are white and gray; the internal (001) crack surfaces are yellow; two (110) free surfaces terminating the crack are red (first subsurface layer is gray); the junction of the crack and the (110) surface is cyan. This 3.5 x 10^6-atom simulation was performed by Shujia Zhou, David Beazely, Peter Lomdahl, Brad Holian, and Art Voter of the Theoretical Division at Los Alamos National Laboratory, using the massively parallel SPaSM code on the CM-5 in the Advanced Computing Laboratory. An introduction to interatomic potentials for atomistic simulations begins on page 17.

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