

# MRS BULLETIN

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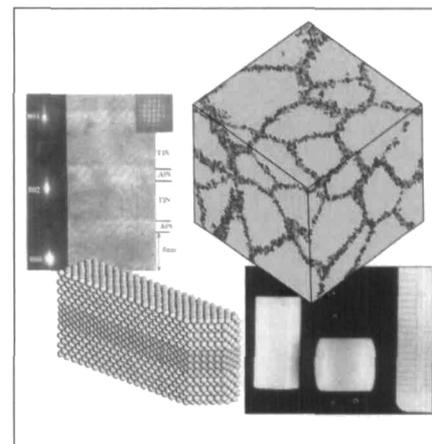
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**ON THE COVER:** (Top Left) High-resolution transmission electron micrograph of an AlN/TiN superlattice with a bilayer period of 6.8 nm and AlN layer thickness of ~1.7 nm. The cubic symmetry is apparent throughout the superlattice indicating the metastable cubic phase of AlN. Insets show selected area diffraction pattern and magnified region. See article on page 20.

(Top Right) Computer-generated nanophase Cu: yellow atoms are atoms with fcc local crystalline order, green and blue atoms are grain boundary atoms with non-fcc local crystalline order (green: 12-coordinated, blue: non-12-coordinated). (Courtesy of H. Van Swygenhoven, Paul Scherrer Institut, Switzerland.)

(Bottom Left) A computer-generated model of a copper interlayer (red atoms) sandwiched between two (very thick) layers of silver. Copper, which is normally fcc, adopts a bcc crystal structure as a stable configuration with its {110} planes parallel to the sides of the model. The stability of this arrangement is due to a remarkable coincidence that the length of a face diagonal of bcc Cu is almost exactly equal to the lattice parameter of Ag. Consequently, a {100} face of Ag acts as a template for constructing the bcc phase of Cu. A corner of the model has been sliced off to reveal a {110} plane of Ag and a {100} plane of Cu. More information on metastable phases will be found on page 20. (Courtesy of R.G. Hoagland, Washington State University.)

(Bottom Right) Photo showing a sample before and after superplastic deformation in nanocrystalline zirconia. See the article on page 44.

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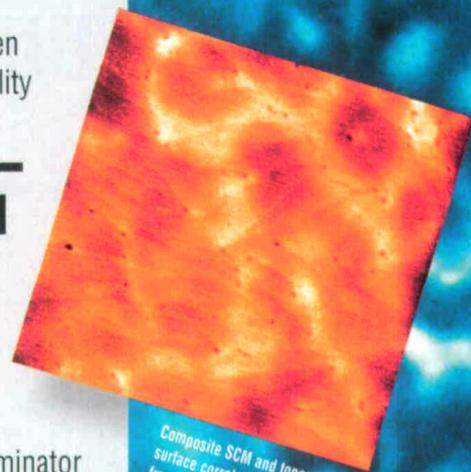
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AFM phase image of liquid crystalline dendrimer showing birefringent "fan"-like domains\*



Diamond-tipped polymer for contact lenses. Sample courtesy DAC Vision, 50 μm.

\*Sample courtesy A.P. Shilov, Moscow State University, 25 μm

Background: MFM image of a  $Fe_{80}B_{10}Si_{10}$  ribbon revealing stress-induced magnetic structure that can lead to power losses in electrical transformers, 30 μm scan courtesy M.E. Hawley, Los Alamos National Lab