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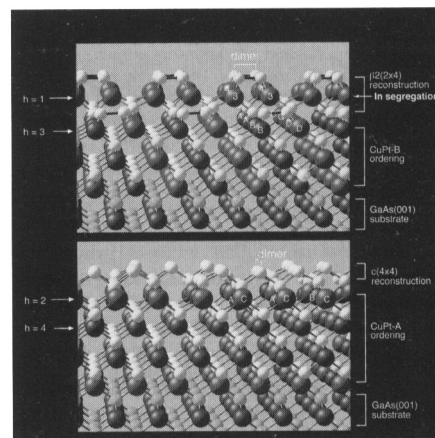
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ON THE COVER: These figures show the predicted lowest energy configurations of a (100) film of $\text{Ga}_{0.5}\text{In}_{0.5}\text{P}$ (Ga = blue, In = red, P = yellow) on a GaAs(100) substrate (As = green), illustrating the relation between (a) surface reconstruction, (b) surface segregation, and (c) subsurface ordering. TOP: When the reconstruction is $\beta 2(2 \times 4)$, In segregation (red atoms under the dimers) and CuPt-B ordering (alternating $\langle 111 \rangle$ planes of In and Ga) exist. CuPt-B ordering implies that there is Ga under the dimer (site A) and In between dimer rows (site C). If we swap these Ga and In atoms, a large strain field results, raising the total energy by 150 meV/pair. This shows that the CuPt-B arrangement is stable. BOTTOM: When the reconstruction is $c(4 \times 4)$ with the surface dimer rotated by 90° with respect to those of $\beta 2(2 \times 4)$, the In segregation disappears and the subsurface ordering changes from CuPt-B to CuPt-A. In this case, we have Ga occupying sites A and B, while In occupies site C. Ordering leads to major changes in material properties, including bandgaps, polarization, band offsets, and internal electric fields. For more details on these calculations, see the following: S.B. Zhang, S. Froyen, and A. Zunger, *Appl. Phys. Lett.* **67** (1995) p. 3141; S. Froyen and A. Zunger, *Phys. Rev. B* **53** (1996) p. 4570; and "Spontaneous Atomic Ordering in Semiconductor Alloys: Causes, Carriers, and Consequences," by A. Zunger on page 20 of this issue.

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