

SILICENE**Flatter silicon**

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Graphene's many interesting and attractive properties derive from the hexagonal, two-dimensional arrangement of its carbon atoms. Carbon is not alone, however, in being able to form such structures: boron nitride, for example, can also do it. A silicon analogue to graphene is attractive because it could be synthesized and processed using mature semiconductor techniques, and more easily integrated into existing electronics. Although theorists have speculated about silicene, it has not been observed. Now, Bernard Aufray, Hamid Oughaddou and colleagues at CNRS, the University of Central Florida, the University of Cergy Pontoise, and CEA have observed silicon structures that are suggestive of silicene.

Using a scanning tunnelling microscope, the researchers studied self-aligned silicon nanoribbons deposited onto a silver crystal with near-atomic resolution. The images revealed hexagons in a honeycomb structure similar to that of graphene. Density functional theory calculations showed that silicon atoms tend to form such honeycomb structures on silver, and adopt a slight curvature that makes the graphene-like configuration more likely.

In addition to their potential compatibility with existing semiconductor techniques, silicon nanoribbons have the advantage that their edges do not exhibit oxygen reactivity.