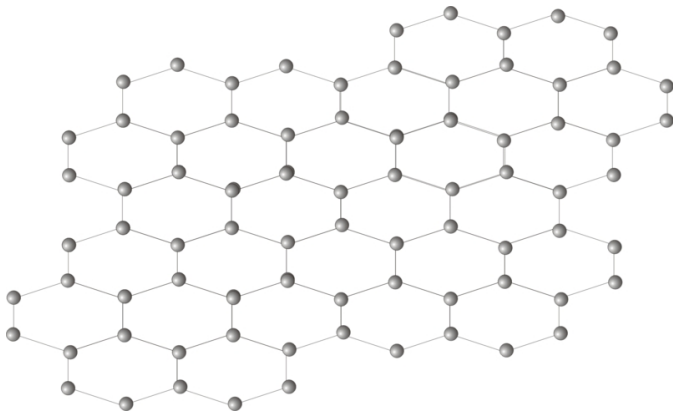


## Will Graphene Fulfill its "Miracle Material" Promise?

Written by Marco Attard  
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Which material will lead the post-silicon computing future? Graphene steps forward as likely candidate, as researchers find a means of making the "miracle material" fulfill its promise in electronics.



Discovered in 2004 by two University of Manchester scientists (winning them the 2010 Nobel prize in physics), graphene consists of one-atom-thick sheets of carbon. It can carry electric charges faster than any other material, making it theoretically perfect for use in electronics... but it makes a terrible semiconductor (essential for making transistors) and doesn't take well to metal contacts.

Now scientists at Friedrich-Alexander University Erlangen-Nuremberg in Germany and the Swedish research institute Acreo AB have a proposal to solve the problem-- cooking graphene from silicon carbide.

Silicon Carbide is a simple silicon-carbon crystal. Heat it up and silicon atoms rise from the crystal, leaving a graphene layer below. The researchers discovered a means of etching electrical channels into silicon carbide wafers (defining where different transistor parts will be) using hydrogen to create regions with either conducting or semiconducting properties.

The process creates graphene ideal for transistor use.

But will graphene truly be the material of the future? What about "silicene"-- a single layer of silicon atoms with graphene-like properties...

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Go [Tailoring the Graphene/Silicon Carbide Interface for Wafer-Scale Electronics \(Nature Communications\)](#)

Go [Silicene: Compelling Experimental Evidence for Graphenelike Two-Dimensional Silicon \(Physical Review Letters\)](#)