

# This Photon-Printed Carbon Is Stronger Than Diamond

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by [Seeker](#)

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Scientists might have reached the theoretical limit of how strong this particular material can get, designing the first-ever super-light carbon nanostructure that's stronger than diamond.

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Carbon is a famously versatile element in the diversity of structures it can take, from graphite like in the tip of a pencil to a diamond. Both are just pure carbon, but with atoms arranged in different patterns. The latest development in the nanoworld of carbon comes from a team that has designed something called carbon plate-nanolattices.

Under a scanning electron microscope, they look like little cubes, and the math indicated that this structure would be incredibly strong, but it's been too difficult to actually make, until now.

The team's success was made possible by a 3D printing process called two-photon polymerization direct laser writing, which is essentially 3D printing on the level of atoms and photons.

Curious about two-photon lithography? The clip at 1:30 shows a microscopic castle designed by Daniela Mitterberger and Tiziano Derme being printed using this technique. The castle is so tiny that it fits ON THE TIP OF A PENCIL! How cool is

that?! This art project is a collaboration between researchers at the Institute of Materials Science and Technology of the TU Wien (Technische Universität Wien, Austria), and design studio MAEID. A recent TU Wien spin-off UpNano is now commercializing this high-resolution 3D printing technology and materials.