Black silicon

With the accidental discovery of "black silicon," Harvard physicists may have very well changed the digital photography, solar power and night vision industries forever. What is black silicon, you say? Well, it's just as it sounds. Black silicon. It's what this revolutionary new material *does* that's important, starting with light sensitivity. Early indications show black silicon is 100 to 500 times more sensitive to light than a traditional silicon wafer.

To create the special silicon, Harvard physicist Eric Mazur shined a super powerful laser onto a silicon wafer. The laser's output briefly matches all the energy produced by the sun falling onto the Earth's entire surface at a given moment in time. To spice the experiment up, he also had researchers apply sulfur hexafluoride, which the semiconductor industry uses to make etchings in silicon for circuitry. Seriously, he did this just for kicks and to secure more funding for an old project.

“I got tired of metals and was worrying that my Army funding would dry up,” he said. “I wrote the new direction into a research proposal without thinking much about it — I just wrote it in; I don’t know why," he said.

The new experiment made the silicon black to the naked eye. Under an electron microscope, however, the dark sheen was revealed to be thousands, if not millions, of tiny spikes. As we said above, those spikes had an amazing effect on the light sensitivity of the wafer. Mazur said the material also absorbs about twice as much visible light as traditional silicon, and can detect infrared light that is invisible to today's silicon detectors.

And there's no change to the manufacturing process, Mazur said, so existing semiconductor facilities can create black silicon without much additional effort or, more importantly, money. [New York Times]