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## Ultra-Intense Laser Blast Creates True 'Black Metal'

Nov. 27, 2006 -- A process involving an incredibly intense burst of laser light that can change the properties of almost any metal to render it black could potentially make everything from fuel cells to a space telescope's detectors more efficient, said the scientists who inadvertently discovered it.

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"We wanted to see what would happen to a metal's properties under different laser conditions, and we stumbled on this way to completely alter the reflective properties of metals," said Chunlei Guo, assistant professor of optics at the University of Rochester. "We've been surprised by the number of possible applications for this."



Chunlei Guo, assistant professor of optics at the University of Rochester, and students in his laser lab. (Photo: University of Rochester)

The key to creating black metal is an ultrabrief, ultraintense beam of light called a femtosecond laser pulse. The laser burst lasts only a few quadrillionths of a second. A femtosecond is to a second what a second is to about 32 million years.

During its brief burst, Guo's laser unleashes as much power as the entire grid of North America onto a spot the size of a needle point. That

intense blast forces the surface of the metal to form nanostructures -- pits, globules and strands - that both dramatically increase the area of the surface and capture radiation. Some larger