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### ENERGY TECH

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

by Staff Writers

Rochester NY (SPX) Nov 22, 2006

"Black gold" is not just an expression anymore. Scientists at the University of Rochester have created a way to change the properties of almost any metal to render it, literally, black. The process, using an incredibly intense burst of laser light, holds the promise of making everything from fuel cells to a space telescope's detectors more efficient-not to mention turning your car into the blackest black around.



Femtosecond laser.

"We've been surprised by the number of possible applications for this," says Chunlei Guo, assistant professor of optics at the University of Rochester. "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."

The key to creating black metal is an ultra-brief, ultra-intense beam of light called a femtosecond laser pulse. The laser burst lasts only a few quadrillionths of a second. To get a grasp of that kind of speed-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 and nanostructures-pits, globules, and strands that both dramatically increase the area of the surface and capture radiation. Some

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