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- Science & Space
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Concentrated sunlight used in laser surgery

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(AP) -- Scientists in Israel have concentrated free sunlight into a high-intensity beam typically reserved for expensive laser surgery.

Details of the liver surgery experiments on mice appear in Thursday's issue of the journal Nature.

"It would be especially valuable in my university's medical center, which has not been able to afford a single laser fiber-optic surgical system," said the study's lead author, Jeffery M. Gordon of Ben-Gurion University in Tel Aviv.

Sophisticated laser surgery equipment costs more than \$100,000, while the sunlight scalpel system is assembled with off-the-shelf parts.

Gordon and partner Daniel Feuermann used a rooftop mirror less than 8 inches wide to focus bright sunlight and funnel it down a long optical fiber about 60 feet into the lab. Other mirrors manipulate and concentrate the sunlight along its journey.

The beam can be adjusted, but photons cannot be stored in a battery like electricity. So the sunbeam scalpel is only useful when the sun is shining -- bad news for hospitals in some cloudy or dark cities like Seattle or Stockholm.

"Its key drawback is its being restricted to clear-sky periods in sunbelt regions," Gordon said.

In the experiments, the researchers anesthetized two female rats. They directed the concentrated solar energy to lesions on their exposed livers that simulated cancerous tumors. Each animal was irradiated twice in separate sections of their livers.

The surrounding, untreated portions of the rat livers functioned normally after surgery. Liver cells exposed to the sunbeam were vaporized in a pattern similar to liver surgery by laser, they reported.

Gordon said the inexpensive system could be used in desert communities, as well as field clinics for the military and refugee camps.

The sunlight scalpel would not be appropriate for more delicate laser procedures, such as surgery on the eyes and skin, which use a "cool" low-power beam.

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