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UNM Scientist Honored for Microwave Technology Work

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Edl Schamiloglu has toiled quietly since 1988 in his basement lab at the University of New Mexico, working the bugs out of high-powered microwave technology.

But in 2003, the world suddenly discovered him. Articles quoting Schamiloglu have cropped up in The New York Times, The Washington Post and other national publications.

The president of AT&T Labs called recently and invited Schamiloglu to discuss the potential threat that high-powered microwave devices pose to communication systems. That meeting will likely take place this month.

"Events have caught up to us now so we can have our 15 minutes of fame," he said recently at his lab in the Electrical and Computer Engineering building.

Why the sudden interest?

High-powered microwave devices of the type Schamiloglu and his team study produce currents large enough to damage computer microprocessors.

Schamiloglu said Department of Defense researchers are using his work to develop weapons that can knock out computer and communications systems.

The Pentagon has long been interested in potential military uses of high-powered microwaves, also called directed energy. Schamiloglu estimates that he has received $12 million since 1988 for his research, most of it from the Air Force Office of Scientific Research.

UNM is a logical site for such study, he said, because the Air Force Research Laboratory at Kirtland Air Force Base is the Pentagon's center for research on directed-energy weapons. The state's two national labs also perform high-powered microwave research, he said.

Stories leaked to the media last year suggested that the Pentagon had used a non-lethal microwave device to knock out communications systems in Iraq. Schamiloglu said he believes the U.S. military has the capability to deploy such a weapon, though he doesn't know if one was used in Iraq.

"It's entirely possible," he said. "I have no idea, of course. It's all speculation. But the technology is at a point where it definitely could be feasible."

Heightened concern about terrorism is another reason for

Schamiloglu's new visibility.

Directed-energy weapons pose a threat that terrorists could use such a device, powered by a small explosive, to knock out vital computing and communications systems.

UNM researchers are quick to note that their work has potential applications beyond weaponry.

Christos Christodoulou, UNM chairman of electrical and computer engineering, is working on an improved microwave antenna that could greatly expand the amount of data transmitted across the microwave spectrum, he said.

But for now, weaponized uses of directed-energy are getting most of the attention.

Narrowband systems, like those studied at UNM's lab, focus huge amounts of energy into a single microwave frequency. The UNM team is working on improved materials and designs that will allow researchers to build smaller high-powered microwave devices.

Narrowband microwave devices are probably too expensive and sophisticated for terrorist use.

But not so ultrawideband devices that could be powered by chemical explosives, Schamiloglu said.

Someone with a knowledge of power generation devices could make a crude ultrawideband weapon that emitted enough energy to disrupt an air traffic control center or communications network, he said.