

briefs

RESEARCH SEEKS SAFER ALTERNATIVE TO X-RAYS

Electrical and computer engineering professor Jim Browning is partnering with Austin, Texas-based Stellar Micro Devices with \$100,000 in start-up funding from the U.S. Defense Advanced Research Projects Agency to develop a miniaturized device to generate high-frequency electromagnetic waves. The device could someday help provide a safer alternative to X-rays or be used as part of new secure communications systems.

Browning is performing computer modeling of the device as part of the project's six-month first phase. He says he is hopeful further phases of the project will be approved that will provide significantly more funding.

The tiny device, called a Micro Vacuum Backward Wave Oscillator, would be capable of generating electromagnetic waves at a frequency of more than 100 billion cycles per second (100 GHz). For comparison, cell phones operate at frequencies around 1 billion cycles per second (1GHz) while FM radios operate around 100 million cycles per second (100 MHz). The development of a miniaturized system with a range of wave frequencies is of great interest and still very much in the experimental stage, says Browning.

MICRO-SENSOR PROJECT RECEIVES EPA GRANT

Boise State's Center for Environmental Sensing will receive a \$50,000 grant from the U.S. Environmental Protection Agency to develop a micro-sensor that can be used to identify and measure contaminants from a chemical spill or other industrial source, or agents used in chemical warfare.

Wan Kuang, a professor in the Department of Electrical and Computer Engineering, will work with Amy Moll, chair of the Department of Materials Science and Engineering, on developing "High-Sensitivity Metal Dielectric Plasmon Surface Micro-Sensors."

The micro-sensor Kuang is developing could be used to detect contaminants in vapors or in liquids. Hundreds or even thousands of different sensors could be integrated onto a single microchip so that the miniaturized device could measure multiple chemical substances simultaneously. This would be a significant advance over micro-sensors currently in use, which are capable of only detecting a few different chemicals at the same time.

says. "When I'm reading a scientific magazine or something, I now have the knowledge to know what I'm seeing or reading about."

When Streeter is asked to consult with law-enforcement officials, she employs these same skills to determine whether bones that have been found are human or not, and sometimes to assist in identifying the victim.

To help her students understand what to look for in situations like that, she assigns them a "forensic case" complete with a crime scene description, various objects found at the scene and a set of bones or bone fragments, often from more than one "victim." Students must then determine the cause of death, number of victims, sex and age of each person, and more.

Since Streeter is Boise State's first physical anthropologist, she is working to build up a good collection of human and animal bones. "Students bring me bones all the time," she laughs. "My husband says they should be bringing me apples, but I need [bones] for comparison."



Streeter, right, explains the structure of a skull to senior anthropology major Maria Venegas.

CSI Boise: Anthropology prof bones up on the past

By Kathleen Craven

No bones about it: You can learn a lot from a rib, femur or skull. Margaret Streeter, Boise State's first physical/forensic anthropologist, studies the microstructure of bones to learn more about the person, or animal, it once belonged to. Bone morphology (or structure) can reveal age, sex, height, health and other details, even if the piece being examined is only a fragment.

Thanks to the popularity of television crime shows such as *CSI* and *Bones*, her classes and workshops are attracting not only anthropology and criminal justice majors, but also students from other majors who are fascinated with the idea of solving forensic mysteries.

A two-weekend forensic workshop offered each semester continues to fill up, prompting Streeter to add an extra workshop next fall. In the workshop as well as in her regular course, she teaches skeletal analysis (determining age, sex and ancestry, for example) and gives students actual skulls and other bones to work with. The human and nonhuman bones range from fairly fresh to bleached and dry, indicating the length of time since death.

"I slip [animal bones] in to see if they can determine whether or not they're human," Streeter says. "That's always the first question. Once you get them on that, they never forget it."

The second question students must answer is whether the bones are of forensic or archaeological importance. Bones from a Native American, for instance, are protected by specific points of law, while bones from a possible homicide must be locked up to maintain the integrity of the evidence.

Maria Venegas, a senior cultural anthropology major who recently took Streeter's human variation course, says that while the class was challenging, it was also practical, teaching her skills that will help her in her future career as well as in daily life.

"Now, when I see any kind of bone, I know and recognize it," she