surface and a mirrorlike flat bottom surface. The combination helped newly created photons bounce around inside the device until they could find an escape route, raising the efficiency to more than 1%.

The next step for the team is to convert the silicon LED’s steady stream of light into a series of pulses that can encode information, by connecting the LED to a device called a modulator. Then both devices will be placed directly onto a silicon computer chip.

—ROBERT F. SERVICE

**ECOLOGY**

**African Elephant Species Splits in Two**

As the largest land mammal, elephants should be hard to miss. But scientists have apparently overlooked an entire species. On page 1473, a team of geneticists and elephant experts describe new molecular evidence showing that forest- and savanna-dwelling elephants, currently lumped together, are two separate species. The results indicate that the two populations are as genetically distinct as lions are from tigers. Indeed, the researchers propose two separate species names: *Loxodonta africana* for the savanna elephants and *Loxodonta cyclotis* for the forest elephants. “The morphological evidence has been very, very strong,” says conservation biologist Samuel Wasser of the University of Washington, Seattle. “When you see the genetic data, it seems almost a no-brainer.”

The team bases its claim on data from an extensive collection of tissue samples from 195 animals in 21 different elephant populations. Georgiadis spent 8 years collecting the samples, shooting needlelike darts into free-ranging elephants. The darts collected a plug of skin and then fell to the ground, enabling Georgiadis to retrieve them after the startled elephant ran away. The project was originally designed to collect genetic signatures so that ivory samples could be traced to their elephant populations—a goal other geneticists are pursuing. A preliminary analysis of the mitochondrial genes suggested significant differences between forest and savanna dwellers (Science, 7 March 1997, p. 1418), a finding that piqued Georgiadis’s interest, but a more robust test with nuclear genes was needed to cinch the case, he says.

To pursue the question, Georgiadis teamed up with researchers at the National Cancer Institute (NCI) in Frederick, Maryland, to measure the genetic variation between the populations. Alfred Roca, a postdoc at NCI, with geneticists Stephen O’Brien and Jill Pecn-Slattery, sequenced portions of four nuclear genes, a total of 1732 nucleotides, from each of the samples. The researchers focused on the noncoding intron regions of the genes, which are not subject to natural selection; this makes them more reliable indicators of the random genetic changes that occur over time.

The team pegged the genetic distance between forest and savanna samples as more than half as large as the distance between Asian and African elephants—long recognized as distinct genera. Only one of the populations showed the type of genetic mixing that could come from interbreeding, and that apparently happened several generations ago. To O’Brien, that means that crossbreeding between the two populations “does occur once in a while, but not very often.”

The new genetic evidence has implications for conservation, says Georgiadis. Instead of assuming that 500,000 elephants exist in Africa, “there are many fewer than that of each kind, and they’re both much more endangered than we presumed,” he says. Researchers estimate that up to one-third of African elephants are forest dwellers.

Ivory from forest elephants is especially prized for its hardness and sometimes pinkish hue. Wasser cautions that conservation organizations must be alert: The current international regulations list only *Loxodonta africana* as protected. If the law is not changed quickly to reflect a new species name, an inadvertent loophole might leave the vulnerable forest elephant even more at risk.

—GRETCHEN VOGEL

**VIROLOGY**

**Finally, a Handle on The Hantaviruses**

A group of U.S. Army virologists has found by accident what researchers had been seeking for decades: an animal model to study hantaviruses, a fearsome group of rodent-borne pathogens that cause disease and death across the globe. In a paper accepted by the journal Virology, they report that Syrian hamsters get sick and die when injected with a hantavirus from South America—and that the animals’ disease looks strikingly like hantavirus pulmonary syndrome (HPS), one lethal manifestation of the infection in humans.

The report, from a group at the U.S. Army Medical Research Institute of Infectious Diseases (USAMRID) in Fort Detrick, Maryland, means that researchers at last have a way to study how one member of the family sickens and kills—and how the disease can be stopped. “I’m impressed,” says Heinz Feldmann, a virologist at the Canadian Science Centre for Human and Animal Health in Winnipeg. “This will definitely speed up vaccine and drug development.” Virologist Stuart Nichol of the U.S. Centers for Disease Control and Prevention in Atlanta hails the study as “a major breakthrough for the field.”

The hantavirus family grabbed world headlines in 1993 when an outbreak occurred in the Four Corners area of the southwestern United States. The culprit, now called Sin Nombre virus, is one of several hantaviruses that cause HPS throughout North and South America. No specific
African forest elephants (top) have rounder ears and straighter tusks than savanna-dwelling elephants (bottom).