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From the Los Angeles Times

UCLA mathematicians discover a 13-million-digit prime number

The mathematicians have found the first verified Mersenne prime number with more than 10 million digits, putting them in line to win a six-digit prize from the Electronic Frontier Foundation.

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September 27, 2008

UCLA mathematicians appear to have won a \$100,000 prize from the Electronic Frontier Foundation for discovering a 13-million-digit prime number that has long been sought by computer users.

While the prize money is nothing special, the bragging rights for discovering the 46th known Mersenne prime are huge.

"We're delighted," said UCLA's Edson Smith, leader of the effort. "Now we're looking for the next one, despite the odds," which are thought to be about one in 150,000 that any number tested will be a Mersenne prime.

Prime numbers are those, like three, seven and 11, that are divisible only by themselves and one. Mersenne primes, named after the 17th century French mathematician Marin Mersenne, who discovered them, take the form $2^P - 1$, where P is also a prime number.

In the new UCLA prime, $P = 43,112,609$.

Thousands of people around the world have been participating in the [Great Internet Mersenne Prime Search](#), or GIMPS, in which underused computing power is harnessed to perform the complex and tedious calculations needed to find and verify Mersenne primes. The prize is being offered for finding the first Mersenne prime with more than 10 million digits.

Smith and his UCLA colleagues have, since last fall, harnessed the power of the 75 machines in the university's Program in Computing/Math Computer Lab, which is used by students for computer projects. Smith, a system administrator, realized that the lab was using only a fraction of its available CPU power. Rather than let it go to waste, he and his colleagues decided to use it for the GIMPS project.

The new Mersenne prime was discovered Aug. 23 on a Dell Optiplex 745 running Windows XP. The number was verified by a different computer system running a different algorithm.

The new prime is the eighth Mersenne prime discovered at UCLA. In 1952, mathematician Raphael Robinson found five of them using UCLA's Standards Western Automatic Computer. They were the 13th through 17th Mersenne primes discovered, the first ones found in more than 75 years, and the first to be discovered using a digital computer. Each had a few hundred digits.

In 1961, mathematician Alexander Hurwitz discovered two more, each with more than 1,200 digits, on the university's IBM 7090 mainframe.

The Electronic Frontier Foundation is an activist group supporting individual rights on the Web. The group established a series of prizes in 1999 to promote cooperative computing on the Web.

The prize will be awarded when the new prime is published, probably next year. By prearrangement, half of the money will go to UCLA, a quarter of it will go to charity and the rest will go to other GIMPS participants and the organization itself.

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