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...tions per second.

Argonne is getting one of the first models in a new line of IBM supercomputers called Blue Gene/P, which uses much less electricity per teraflop than the previous model, called Blue Gene/L.

Argonne's current Blue Gene/L supercomputer is rated at 5.7 teraflops, making it the 373rd-fastest in the world, according to Top500.org, a Web site that tracks the world's 500 fastest supercomputers.

The current record-holder is the Department of Energy's Lawrence Livermore National Laboratory in California, which has an IBM Blue Gene/L with a peak capability of about 360 teraflops.

The cost of Argonne's new supercomputer is confidential, but an IBM spokesman says it's somewhere in the range of \$50 million to \$150 million.

In practical terms, the increased horsepower means a complex genetics experiment running on the lab's current supercomputer might require four days to produce results, but with the new supercomputer it would take only about four hours, says an IBM spokesman. "In a lot of fields, you'll get an exponential bump in results," he adds.

Most of the computing time on the new supercomputer will be allocated by a peer-reviewed DOE program for "computationally intensive research projects from industry, academia, and research organizations, which are poised to make high-impact scientific advances through the use of a large allocation of computer time and data storage," according to a lab statement.



A supercomputer being installed at [Argonne National Laboratory](#) is designed to be the world's fastest. But one more than twice as fast is expected to become a reality in the not too distant future.

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"Researchers can employ this new computing resource to attack cutting-edge problems in science and engineering at unprecedented scale and speed," Ray Bair, director of the Argonne Leadership Computing Facility, says in a statement, "expanding the already diverse research Blue Gene/L has been supporting in areas like understanding the molecular basis of Parkinson's disease, designing more

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efficient jet engines, and manipulating light at the nanoscale."

But the quest for a petaflop machine, capable of doing 1,000 trillion calculations per second, is expected to become a reality in the not too distant future.

The computer Argonne will have running by next year will be "the world's fastest, period," the IBM spokesman says. But by late next year or so, "somebody will hit a petaflop. We think it's going to be us."

IBM will also be collaborating with Argonne to develop Blue Gene software that takes advantages of the new system's capability, leading to even faster machines.

"This access and involvement will speed the evolution of software for Blue Gene and provide the community with a platform for testing ideas applicable to future petaflops and exaflops systems," Rick Stevens, associate laboratory director of Computing and Life Sciences at Argonne, says in a statement. An exaflop is one quintillion calculations per second, or 10 followed by 18 zeroes.

In addition, Argonne has almost finished installing a smaller, Blue Gene/P that will peak at 111 teraflops.

The two computers are housed in the same room and the wiring has been arranged so eventually they can be combined, after the larger computer is running reliably, to create a machine that peaks at 556 teraflops, roughly equivalent to more than 100,000 high-end PCs.

"My hope is that we can do it in 2009," says Mr. Bair in an interview.

The Blue Gene/P is based on refrigerator-sized processing units, with each cabinet having 4,096 quad-core processors and 14 teraflops of computing capacity.

"It's really pretty simple to make these computers bigger," says Mr. Bair. "Just add on cabinets and wiring."

The Blue Gene/P is designed for a maximum of 256 cabinets to be wired together, which would theoretically create more than 3.5 petaflops of computing capacity.

But it's too early to say whether federal funding will support an expansion to that level, or whether Argonne will pursue a next-generation model of supercomputer instead, says Mr. Bair.

"The Department of Energy's computing facilities tend to be long-term projects," says Mr. Bair. "We expect to have a series of world class facilities here, one after the other."

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