The university campuses across the country, scientists and engineers are scrambling to develop radically new kind of computing — and computers — that experts say will revolutionize online communications, encryption and more.

We're delighted to see that they could get a tremendous boost from the U.S. government, thanks to welcome and bipartisan legislation advancing in Congress that would make the research a national priority.

The new field is called quantum information science, or quantum computing, and it clearly is that important. As one congressional staffer said on this week, "We try not to think of it as just faster computing. This is going to allow us to solve problems we've never thought computers could solve.

Just how it will do that is complicated, as it involves the marriage of information science and quantum mechanics, and some of the oldest puzzles in theoretical physics. We'll dive into the details further below, but the race, trust when we say that we think the world on the Internet for decades to come: sending email or making a purchase, as it is complete the national security-level encryption that keeps the nation's secrets safe.

To cite just one example, an encryption that would take a super computer days to crack could, as so-called quantum computers, compute solve. This is the difference between instructing a computer to give one answer 10,000 times, or writing one set of instructions to provide 10,000 answers.

In short, quantum computers are quantum logic gates, or qubits, but in quantum physics has theorized that some subatomic particles are both present and not present at the same time, these qubits can be both 0 and 1 simultaneously. It can mean that the difference between instructing a computer to solve a problem 10,000 times, or writing one set of instructions to provide 10,000 answers.

Last month, the House science committee unanimously endorsed a bill that would instruct the administration to create 10 federal research centers aimed at speeding up development of quantum computers and related technology. The bill was drafted by Texas House Speaker Joe Straus and the Senate is working on a similar bill. As so-called quantum computers come online, that has implications for everything from the efficacy of Google's search algorithms to your online bank accounts and password-protected emails to the secrets kept by the National Security Agency.

The breakthrough has to do with how computers manipulate information. The traditional way of information is a conventional computer to binary digits, or a bit. These bits are binary, meaning they signal either a 0 or 1 value. Simple markers, when enough are strung together, can give computers a practically infinite number of possibilities.

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