Subject: The future of computers (quantum computing)
Posted by Blazer on Fri, 18 Jun 2004 09:04:24 GMT
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http://news.bbc.co.uk/2/hi/science/nature/3811785.stm

For those who are too arsed to click a link and read, well its pretty hard to sum up, so basically just understand that there is a "spooky" (what Einstein called it) property of atoms, known as "entanglement". Two atoms, once entangled mirror the properties of each other even though seperated by great distance. Nobody really knows how this works, it just does, but there have been several successful experiments allready where photons and atoms have been "teleported" (a laser beam destroyed at one location and teleported to another, toggling the properties of a remote particle, etc).

So what does this mean for computers? Think about how a computer works...zeros and ones...the electrical signals flowing through logic gates to signify states. Now imagine that instead of using flowing current going through circuits and logic gates, that we have the ability to simply toggle things on and off, at the speed of light...this basically means a computer that can process multitudes faster than our current supercomputers, while using less power, generating less heat. Note that the description I just gave is a very basic one and you should read the article to understand how it really works.

Teleportation has so many other applications as well...imagine the "throughput" you would get on a "download" if all the atoms signatures of a media device were teleported to your device...instant copy of data.
EDIT: Actually the act of teleporting requires destroying the origional, so it wouldn't be a copy of the data but a relocation of it. But whose to say you couldn't make local copies, and then telport/relocate the local copies to distant places instantly...quite handy

Subject: The future of computers (quantum computing)
Posted by xptek_disabled on Fri, 18 Jun 2004 09:05:53 GMT
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Instant warez.

Subject: The future of computers (quantum computing)
Posted by Blazer on Fri, 18 Jun 2004 09:23:00 GMT
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"The state of a bit in a classical digital computer is specified by one number, 0 or 1. A word in classical computing is described by a string of n-bytes of information where the byte represents the alpha numeric bit, specifically eight bits of information. A quantum bit, called a qubit, might be represented by an atom in one of two different states, which can also be denoted as 0 or 1. Two qubits, like two classical bits, can attain four different well-defined states (0 and 0, 0 and 1, 1 and 0, or 1 and 1). However, unlike classical bits, qubits can exist simultaneously as 0 and 1, with the

probability for each state given by a numerical coefficient. Describing a two-qubit quantum computer thus requires four coefficients. In general, n qubits demand 2n numbers, which rapidly becomes a sizable set for larger values of n. For example, if n equals 50, about 1015 numbers are required to describe all the probabilities for all the possible states of the quantum machine--a number that exceeds the capacity of the largest conventional computer. A quantum computer promises to be immensely powerful because it can be in multiple states at once--a phenomenon called superposition--and because it can act on all its possible states simultaneously. Thus, a quantum computer could naturally perform myriad operations in parallel, using only a single processing unit."

While at Los Alamos National Laboratory in New Mexico, Isaac Chuang, with Neil Gershenfeld of MIT, took another important step by demonstrating that quantum computing can be carried out with ordinary liquids in a beaker at room temperature. Each molecule contains atoms, and the nuclei of atoms act like tiny bar magnets. These can point in only two directions, "up" and "down", because of a property called "spin". A single nucleus can therefore act as a qubit, its spin pointing perhaps up for "off" and down for "on". A given spin lasts a relatively long time and can be manipulated with nuclear magnetic resonance, a technique used by chemists for years. Thus each molecule can act as a "little computer" and is capable of as many simultaneous calculations as there are ways of arranging its spin, according to Chuang, now with IBM Research, who has tackled some simple problems with chloroform. Does this mean the first quantum computer is about to appear on the market? His colleague, Charles Bennett, has a standard response:

"Definitely in the next millennium."

Subject: The future of computers (quantum computing)
Posted by NHJ BV on Fri, 18 Jun 2004 09:34:38 GMT
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Eat that, Macrovision

Subject: The future of computers (quantum computing)
Posted by Xtrm2Matt on Fri, 18 Jun 2004 14:49:27 GMT
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I'd love to see this technology into a computer, nothing is impossible

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Subject: The future of computers (quantum computing)
Posted by Majiin Vegeta on Fri, 18 Jun 2004 15:01:25 GMT
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i would love to see this

i would hate to see the price

Subject: The future of computers (quantum computing)
Posted by z310 on Fri, 18 Jun 2004 16:16:33 GMT
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Its pretty much mean the computer could process etremly fast right? If so could you download at that rate? lol

Subject: The future of computers (quantum computing)
Posted by frijud on Fri, 18 Jun 2004 21:18:12 GMT
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The whole quantum world is really very interesting. At the quantum level, things happen that don't make sense in the newtonian way of thinking.

For example, take Blazor's "spin" idea. When an atom changes spin (from up to down), it just becomes the other spin. It does not slow down spinning in one direction and start spinning the other, it just changes spin, instantly.

We have an instrument in the lab that uses this idea. In general terms, it is called tunneling microsocpy. An electron is on a surface. When you put a piece of metal close to the surface nothing happens because the electron cannot jump between the surface and the piece of metal. However, there is a finenite probability that the electron will "tunnel" and get to the piece of metal. The electron cannot jump, so it tunnels, which basically means that it just stops existing on the surface and starts existing on the piece of metal. The electron never traveled the physical distance between the two parts, it just was there. This is why it is called tunneling. Some speculate that it tunneled thought another universe. The probability of tunneling is basied on what material the surface is made out of, thus it is a usefull tool. Really interesting stuff.

I could go on...but I will shut up now...

Subject: The future of computers (quantum computing)
Posted by icedog90 on Fri, 18 Jun 2004 21:50:56 GMT
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Guys, we can teleport! I've heard about this in the past that they were researching and testing this, trying to figure out how to teleport atoms, but I always thought they wouldn't get it. They actually did it!

Subject: The future of computers (quantum computing)
Posted by Ferhago on Sat, 19 Jun 2004 00:24:54 GMT
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I've heard the phrase "Quantum Entanglement" used before but had no idea what it meant. Well now I do thanks.

Question: Wouldnt this make cloning easier? And if this were used in an application for teleporting would your originial body have to be destroyed first? Otherwise you would have two

And if so by that theory teleporting machines would basically vaporize you and rebuild you elsewhere.

Or am I completely missing the point of this

Subject: The future of computers (quantum computing)
Posted by mrpirate on Sat, 19 Jun 2004 00:29:38 GMT
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You can't teleport, because of the heisenberg uncertainty principle. This states that just by measuring something, you're changing it. Therefore, in trying to measure the exact location of each atom in the human body (which would be necessary), you would be changing the locations.

Subject: The future of computers (quantum computing)
Posted by Ferhago on Sat, 19 Jun 2004 01:29:51 GMT
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What?

Subject: The future of computers (quantum computing)
Posted by terminator 101 on Sat, 19 Jun 2004 02:03:57 GMT
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http://news.bbc.co.uk/2/hi/science/nature/3777589.stm

"To teleport a human would require knowledge of the type and exact position and movement of every atom of the person to be teleported. That is about a hundred thousand million million million million atoms. To send that information down today's fast data transfer systems would take a hundred million times longer than the present age of the Universe (which is about 15 thousand million years).

If it is ever possible, there is the question of whether destroying a human to teleport their information to another place to rebuild them again would constitute murder, and you might also want to discuss if the teleported human would actually be the original person or a copy."

Subject: The future of computers (quantum computing)
Posted by Ferhago on Sat, 19 Jun 2004 02:10:16 GMT
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Well of course it would be a copy. And if the originial wasnt destroyed it would be a mess. I guess it all comes down to ethics

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Subject: The future of computers (quantum computing)
Posted by mrpirate on Sat, 19 Jun 2004 02:27:51 GMT
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Ethics is irrelevant, since it's impossible. If you need a clearer understanding of what the Heisenberg Uncertainty Principle is, check this link.

Subject: The future of computers (quantum computing)
Posted by Ferhago on Sat, 19 Jun 2004 04:52:51 GMT
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I dont need a clearer understanding because I cant understand what you said and chose to interpret what you said as something I cant comprehend and therefore it comes through as "This guy says its impossible based on some scientific fact"

Then terminator 101 comes along and says something to the essence that supports my theory and he seems to be smarter than me because he posted a link to something scientific looking so I lean towards him but not completely disbeleiving the other guy and merging both theories into a "Its ok because it doesnt do that" kind of thing.

Its true ignorance is bliss, Because of my system teleporting is still technically possible in my mind

What I said didnt make sense? Try downgrading your IQ a bit at ebaumsworld.com by watching 6 straight hours of pointless flash cartoons

Alternatively, Stare at a picture of a camera for several hours until the irony soaks in.

Subject: The future of computers (quantum computing)
Posted by terminator 101 on Sun, 20 Jun 2004 23:20:54 GMT
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Thanks for promoting me, Ferhago.
But, I did not say anything in that post, I just copied and pasted those words from the website, so I am not THAT smart, but thanks anyway.

Subject: The future of computers (quantum computing)
Posted by warranto on Mon, 21 Jun 2004 01:25:32 GMT
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Uhhh, teleportation is a possibility, and has already been accomplished, regardless of the uncertainty principle.

http://www.research.ibm.com/quantuminfo/teleportation/
http://www.its.caltech.edu/~qoptics/teleport.html
