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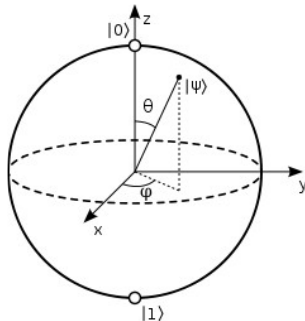
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Dark excitons could light up your quantum computer, life

By [Tim Stevens](#) posted Nov 18th 2010 10:09AM



[Image credit: [Smite-Meister](#)]

VIA [ars technica](#)
SOURCE [Nature Physics](#)

Yeah, we're *still* hanging around playing *Q*bert* and waiting on folks to get those [qubits](#) a spinning. Meanwhile, researchers have found a new path to follow on the way to quantum enlightenment. A new, darker path, which entails the use of so-called dark excitons as quantum bits. While doubling as a great name for future robo-gigolos, a dark exciton is an electron-hole pair with parallel spins. The parallel spin, which makes this quasiparticle "dark," also enables it to be long-lasting and, critically, to be excited with an electrical charge to set its state, a state that can then be read by looking for an emitted photon. Fascinating? Absolutely. Coming to a desktop near you? Not likely -- not unless your desktop is kept at a temperature of 4.2K, anyway.

dark exciton, DarkExciton, electron hole pair, ElectronHolePair, exciton, quantum computer, quantum state, QuantumComputer, QuantumState, qubit, research

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- Mohammad Motiur Rahman** 10 hours ago [REPORT](#)
 What on earth !!! [+](#) [REPLY](#)
- Mohammad Motiur Rahman** 10 hours ago *in reply to Mohammad Motiur Rahman* [REPORT](#)
 I am ready to live in Antarctica , bring it on . Well as long as Apple dudes and Google nerds are around. [+ 5](#) [REPLY](#)
- Stefan Gracik** 10 hours ago *in reply to Mohammad Motiur Rahman* [REPORT](#)
 4 kelvin = -452.47 degrees Fahrenheit [+ 2](#) [REPLY](#)

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- 


Vylen 9 hours ago in reply to Stefan Gracik

Liquid Helium cooling is the obvious answer :p

REPORT
+ 1
REPLY
- 


John Padilla 9 hours ago in reply to Stefan Gracik

Also @Tim Stevens, it's not XX degrees Kelvin. It's just XX Kelvin.

REPORT
+ 2
REPLY
- 


Jon Proce 9 hours ago in reply to John Padilla

This is true. Just 4.2 K

REPORT
+ 1
REPLY
- 

Brad Appel 9 hours ago in reply to John Padilla

They HAVE to fix this. Before I read your comment, I didn't know what they were talking about! Seriously though, a science-y blog should know better, I noticed the error at first glance too.


REPORT
+
REPLY
- 

Tim Stevens MOD 9 hours ago in reply to Brad Appel

Fair enough, and to think I just spent two hours watching a Nova documentary on the pursuit of absolute zero and they didn't mention this sci/grammatical gem.


Post updated. Thanks!

p.s. This is it: <http://movies.netflix.com/WiMovie/Absolute-Zero-Nova/70098669>
It's pretty damned good.

REPORT
+ 4
REPLY
- 


domthoma5 9 hours ago in reply to Mohammad Motiur Rahman

You're going to have to wait until the "Big Grey" until Antarctica gets that cold.

REPORT
+
REPLY
- 


XIUIX 6 hours ago in reply to domthoma5

Lets not talk about reality freezing in-front of the children

REPORT
+
REPLY
- 


htowngr 10 hours ago

Apple has already invented that, you copycat scientists.

REPORT
+ 6
REPLY
- 


MiviviM 10 hours ago

Alfa, beta, gamma, delta... took my happiness away. :(

REPORT
+
REPLY
- 

bittoman 10 hours ago

These excitons got me....excited.


REPORT
+ 2
REPLY
- 


savagemike 9 hours ago

This is a picture of the first working transistor cobbled together at Bell Labs in 1947.
<http://www.porticus.org/bell/images/transistor1.jpg>

That was just 60 years ago.
Don't kid yourself that this science fiction sounding stuff could not be powering your desktop computations some day, and that 'some day' might not be all that distant really.
Technology rides a high-speed rail.


ATTACHED FILES



REPORT
+ 6
REPLY
- 


X 7 hours ago in reply to savagemike

The same thing has been said about fusion power. In 1960, the Atomic Energy Commission estimated there would be as many as 1,000 nuclear power plants in the United States by the year 2000. But that never happened and now scientists say that it will take at least 50 years before fusion power becomes a reality.

REPORT
+ 1
REPLY
- 

Playos 7 hours ago in reply to X

Politics is the brake line (and occasional locomotive coming in the other direction on the same track) for that high speed rail.


REPORT
+ 2
REPLY
- 

RGee 5 hours ago in reply to X


REPORT
+ 1
REPLY

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If it wasn't for public ignorance and unfounded fear, it probably would have happened, and we wouldn't be worrying about oil prices as much today.

- 


Eli Haj 9 hours ago

You know there is something wrong with your computer when it is overheating at 5 Kelvin.

REPORT
+ 10
REPLY
- 


Mr_Tea 9 hours ago

I had a computer that ran at 4.2K, but it kept taking pieces of my finger that got stuck when I hit the power button so I had to get rid of it.

REPORT
+ 1
REPLY
- 


Rajendra Gondhalekar 9 hours ago

..dark excitons..electron hole pair..long lasting...
damn, all I can think of is pr0n.

REPORT
+ 2
REPLY
- 


David Haller 9 hours ago

Time to start miniaturizing dilution refrigerators.

REPORT
+
REPLY
- 


xfungalex 8 hours ago

i can't believe you guys put a spherical coordinate picture to represent quantum computing

REPORT
+ 2
REPLY
- 


Rajendra Gondhalekar 7 hours ago *in reply to xfungalex*

Are you certain about that?

REPORT
+ 1
REPLY
- 


Tim Stevens MOD 7 hours ago *in reply to xfungalex*

It's a Bloch Sphere, a representation of a qubit:
http://en.wikipedia.org/wiki/Bloch_sphere

REPORT
+ 1
REPLY
- 


kal326 8 hours ago

Quantum computing, it knows the true power of the dark side!

REPORT
+ 1
REPLY
- 


olternaut 7 hours ago

4.2 Kelvin? What the hell? Oh come onnnnnnnnnnn! Where the hell are our quantum computers already?!!

REPORT
+
REPLY
- 


XIUIX 6 hours ago *in reply to olternaut*

You have one in your basement. although the act of finding it will destroy it.

REPORT
+ 1
REPLY
- 


olternaut 5 hours ago *in reply to XIUIX*

In my basement? Where? WHERE?

REPORT
+
REPLY
- 


MikeSalem 7 hours ago

WOW .. Darth Vader Computer .. FEEL THE DARK SIDE IN IT

REPORT
+
REPLY
- 

zenbillionaire 6 hours ago

Obviously the next step towards commercial application will be discovery the hot, dark exciton.

REPORT
+
REPLY
- 

Samurai Jack 6 hours ago


Even though I know what dark and light excitons are, I still think they're some kind of Pokemon whenever they come up in conversation.

REPORT
+
REPLY
- 

NIMBUSoo7 6 hours ago

well this was a pointless post. the knowledge i learned from this post is equivalent to knowing that sex in weightlessness is legendary (ok my fail, my example is achievable (by someone)).

REPORT
+
REPLY




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 **oandroido** 5 hours ago

Oh, an electron-hole pair with parallel spins?


You know what? F#ck Smite-Meister AND Q*bert. Dark excitons can suck it.

REPORT
+ 1
REPLY

 **wulfcry** 4 hours ago


It sounds so easy every where I've read it but is a photon a continuous constant cause if it depended on that one would not call it a quantum computer but rather a quasi driven qubit cause I guess the photon has to look both way's to fix the spin right only guessing here.

REPORT
+
REPLY

 **absocold** 3 hours ago

Or instead of going to 4.2K you could just use carbon nanotubes at room temperature. Most of the excitons generated in carbon nanotubes end up decaying to dark excitons anyway, which is actually pretty annoying if you're trying to get light out of the darn things.

REPORT
+ 1
REPLY

 **Dominic Snowdon** 1 hour ago

This is exciting news!

REPORT
+
REPLY

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