Physical Quantum Computers are an Illusion

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Introduction - Philosophy of Science

1. Quantum Computers (QCs) using entanglement are supposedly being built that make factorization fast eliminating public key crytography.
2. QCs are not part of quantitative experimentally collaborated physics, but rather qualitative algorithmic mathematics.
3. James Lighthill view: QCs are chimera whose existence is based on grant maximizing "insufficient scientific discussion."
4. Entanglement is a consequence of the mathematical formalism. Fad based because similar "hidden momentum" claimed to not exist by same people who say QCs are being built.

Slides with more references posted at www.tdl.com/<tilde>smeyer

1995 DiVincenzo Spin Up/Down Spectroscopic QC - skeptical but willing to experment

Ref. "Quantum Computation" in *Science*, vol. 270 13 Oct. 1995, 255-261.

1. Qbits of computers scaled down to individual atoms constructed as doped solid state semiconductor.
2. Interconnecting qbits most speculative and uncertain feature of QCs. Suggests using an "atomic force microscope".
3. Read out is diffraction process with forbidden states. Classical optical diffraction grating read out requires exponential number of gratings in size of factored number.

2010 Ladd - QCs as Quantum Ubiquitous Computing

Ref. "Quantum Computers" *Nature*, vol. 464/4 13 Mar. 2010, 45-53.

1. Engineering to exploit full complexity of many particle quantum wave function just as lasers exploit coherent light.
2. Ubiquitous computing paradigm. QM will play ever more important part in many areas of emerging forms of artificial nanotechnology. QC as social networking.
3. Entanglement is an axiom. Engineering problem becomes information isolation from the rest of the universe and decoherence from QM processes and small imperfections in non ideal machines. For example, provable that QC is possible using only single photon sources.

Physics versus formal mathematics

- Related is Turing Machine computing model wrong.
- William Tutte maximum pessimistic electronic circuit better (Colossus falsfication versus Turing existence from set theory).
- Einstein from Prussian Academy "Lecture on Geometry", 1921.

"This view of axioms, advocated by modern axiomatics, purges mathematics of all extraneous elements, and thus dispels the mystic obscurity, which formerly surrounded the basis of mathematics. But such an expurgated exposition of mathematics makes it also evident that mathematics as such cannot predicate anything about objects of our intuition or real objects."