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As we all may know the virtue of quantum mechanics, although discovered by Einstein was not realized by him. And he could not comprehend the absolution of his own and may others works and ideas. That was nearly a century ago.

As long past as a decade ago (after the millennial) what was said to be holding back a true revolution in informatics and computational mechanics, i probabilistic computation, in empirically observant and dependant phenomena, the scope and breadth of which facilities of industry and science ws said only to be waiting for the available hardware, not lacking in suitable theoretically software:

Such was the quantum computer of the past day and today is a new. It is time to build the first computer architecture, not unlike in some domains in as that of the past, what was impossible 10 years ago is today a reality, and estimate another ten years is needed is highly conservative, a circuit the size of a person's finger today, an impossibility from any technical stance a decade ago today is and tomorrow will be devices capable of the details and systems that follow;. Where complicated systems like weather are reduced to nighting absolutely nothing in terms of what we call error of prediction

While the analytic power of a quantum computation is drastically different than traditional computational analytics, faster, exponentially more accurate, these are not the primary properties that are of most interest to this dialogue. This dialogic and experimental project is aimed to determine multichannel communications distributed quantum systems. This system is referred to as ‘quantum glass’ (https://quantum.glass) or ‘atom glass’ (https://atom.glass)

This technology is referred to generally as ‘quantum Internet’ in literature

Here is a 1000 qubit computer size at 1 cm (squared) per bit (referenced here)
1cm per qubit unit built by DiCarlo group @ TUDelft

compared to

Example device (3 qubit circuit Dicarlo Lab):

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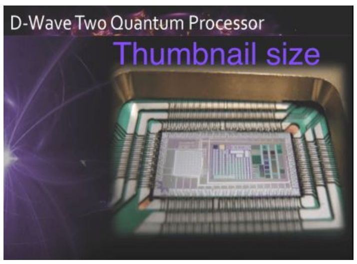
Can this device do the work of a traditional laptop computer CPR GPU?

(component in shed size D-Wave computer 2016)



First impression

These people have no ideas how to describe this technology or apply it: (some time is spend generally just showing this is not a 'normal computer')

Hocky team Example

Logic gate in silicon :
UNSW laboratory 2016 project leader Andrew Dzurak and Menno Veldhorst

Upcoming :
2017

SDK (Software Development Kit) on the IBM Quantum Experience

Qubit handler

Simple fact: the Qubits below 500,000 - a million are not on the scale of the conceptual power we currently attribute to this technology.

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The power of the handler will be the power of the computer. Systems like IBM Q, while ahead of their time at the moment of their development, may miss the mark when simpler devices in computational power are likely to be available, within months or years, may exist already, and could render their hardware obsolete well before even beings useful as a center.
Currently at 20 qbit
More than 50 qbit are neede?

Quantumplayground.ne google's 22 bit playground
The D-Wave Two has ~ 520 qbut

Quantum systems of determination are non causal in the sense that a traditional system tracks (generally) causal actions for deterministic computations like the weather, quantum and dynamic system approaches do this non-causally

Major Researchers	Location
Catherine McGeoch	Amherst College
Leo Kouwenhoven	Quantum Transport group, Di Carlo Lab, Hanson Lab, Kouwenhoven Lab, Vandersypen Lab, Zwiller Lab
Leo DiCarlo	(Buenos Aires, Argentina) DiCarlo Lab^1

Computer Models	**Qubit count**	Maker	**Place of origin**	In production?	price	notes
D-Wave	128	D-Wave Systems	Canada		10m	Nickname: Vesuvius
D-Wave 2	512	D-Wave Systems				
D-Wave 2x	1,097	D-Wave Systems				2015-10
D-Wave 2000Q				Jan 2017	15m	2017-1

Active Message boards

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IBM
https://quantumexperience.ng.bluemix.net/qstage/#/community

Non peer reviewed research mostly (coauthored) by IBM staff
https://quantumexperience.ng.bluemix.net/qstage/#/community/question?questionId=73bfa1e0a6bacf71fa53b5cc81598b0d

Git repositories
https://github.com/IBM/qiskit-api-py
https://github.com/IBM/qiskit-sdk-py

Open Questions:

Price (of single quantum computer) compared to MRI machine or Nuclear power Stations (quantum devices)

Major Laboratories:

Quantum Artificial Intelligence Laboratory (QuAIL), NASA Advanced Supercomputing (NAS) facility, NASA's Ames Research Center in Moffett Field, California

D-Wave

Founded	1999
Headquarters	Burnaby, British Columbia, Canada
Key people	• Vern Brownell, CEO • Geordie Rose, CTO • Eric Ladizinsky, CS • V. Paul Lee, Chair

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(Logic gate in silicon :)
University of New South Wales (UNSW) in Sydney
Australian National Fabrication Facility
UNSW laboratory 2016 project leader Andrew Dzurak and Menno Veldhorst

Model	D-Wave	D-Wave 2	D-Wave 2x	D-Wave 2000Q
Computers sold	2	2	3	4
year	2011	2013	2015	2017
Buyers	Lockheed Martin	Lockheed Martin Google/NASA/USRA	Lockheed Martin Google/NASA/USRA Los Alamos National Laboratory	Temporal Defense Systems Inc. Google/NASA/USRA Volkswagen Group Virginia Tech

Approx 60 (58) projects arounds the world

1QBit
Airbus
Aliyun (Alibaba Cloud)
Anyon Systems Inc.
Artiste-qb.net
AT&T
Atos
Booz Allen Hamilton
BT
Cambridge Quantum Computing Ltd.
Carl Zeiss AG
D-Wave

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EvolutionQ
ISARA
BalckBerry-ISARA
Quantum Valley Investments
CipherQ
Fujitsu
Google QuAIL
h-bar
HP
Hitachi
Honeywell
HRL Laboratories
Huawei Noah's Ark Lab
IBM
ID Quantique
Infosec Global
ionQ
Intel
KPN
Lockheed Martin
MagiQ
Microsoft Research QuArC
Microsoft Research Station Q
Mitsubishi
NEC Corporation
Nokia Bell Labs
Northrop Grumman
NTT Laboratories
NuCrypt
QC Ware
QuantumCTek
Quantum Circuits
Quantum Diamond Technologies
Qubet
Qubitekk
QuintessenceLabs
QxBranch
Raytheon/BBN
Rigetti
RIKEN
SeQureNet
SK Quantum
Sparrow Quantum

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Toshiba
UQDevices
Zyvex

Current Project :

https://paradox.computer/doc/2010-experimental-evaluation-of-an-adiabatic-quantum-system-for-combinatorial-optimization.pdf
https://paradox.computer/doc/2013-7-22-a-note-on-qubo-instances-defined-on-chimera-graphs.pdf
https://paradox.computer/doc/2016-5-16-performing-quantum-computing-experiments-in-the-cloud.pdf
https://paradox.computer/doc/2017-1-20-d-wave-overview.pdf
https://paradox.computer/doc/2017-1-31-tapering-off-qubits-to-simulate-fermionic-hamiltonians.pdf
https://paradox.computer/doc/2017-11-8-error mitigation-for-short-dept-quantum-circuits.pdf

Distributed Network

http://atom.codes
http://atom.glass
http://atom.guides
http://atom.parts
http://matter.properties
http://paradox.computer
http://quantum.exposed
http://quantum.glass
http://small.zone

Resources:

(1) New smaller system
http://dicarlolab.tudelft.nl/research/
(base site)
http://dicarlolab.tudelft.nl
(publications)

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http://dicarlolab.tudelft.nl/publications/

https://plus.google.com/+QuantumAILab/posts/DymNo8DzAYi
https://ti.arc.nasa.gov/tech/dash/physics/quail/
https://physics.aps.org/articles/v8/87
http://www.archduke.org/stuff/d-wave-comment-on-comparison-with-classical-computers

https://www-03.ibm.com/press/us/en/pressrelease/51740.wss#release

http://news.mit.edu/2015/quantum-error-correction-0526

Non superconducting qubits -- not cold --

Capacity increases with each additional qubit (by doubling (2 times) the previous power)

KEY TERMS:
ancilla
ancilla error rate
ancilla measurements
ancilla sub-block
broadband dephasing source
commuting measurements
data-qubits
final computed Pauli update
flux noise
hadamard gates
logical X and Z gates
logical fidelity
logical qubits
Minimization task
nearest-neighbor interactions
non-Clifford gates
optimal decoder
parity measurements