

Photonics Quantum Technology

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www.quantumphotonics.at

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Visit of the WKO

University of Vienna, Austria

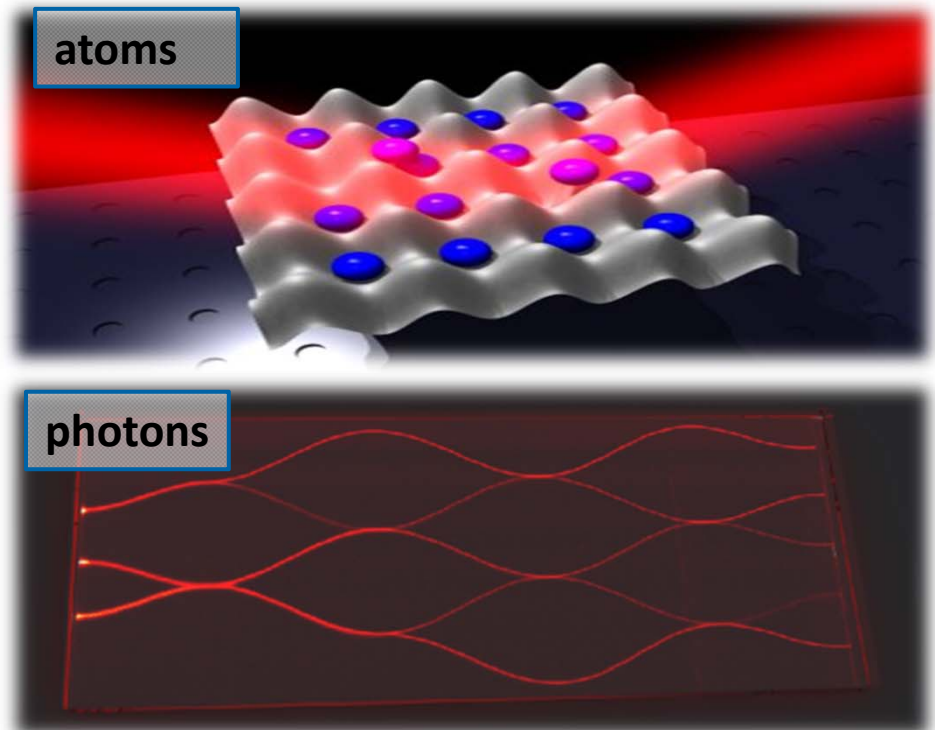
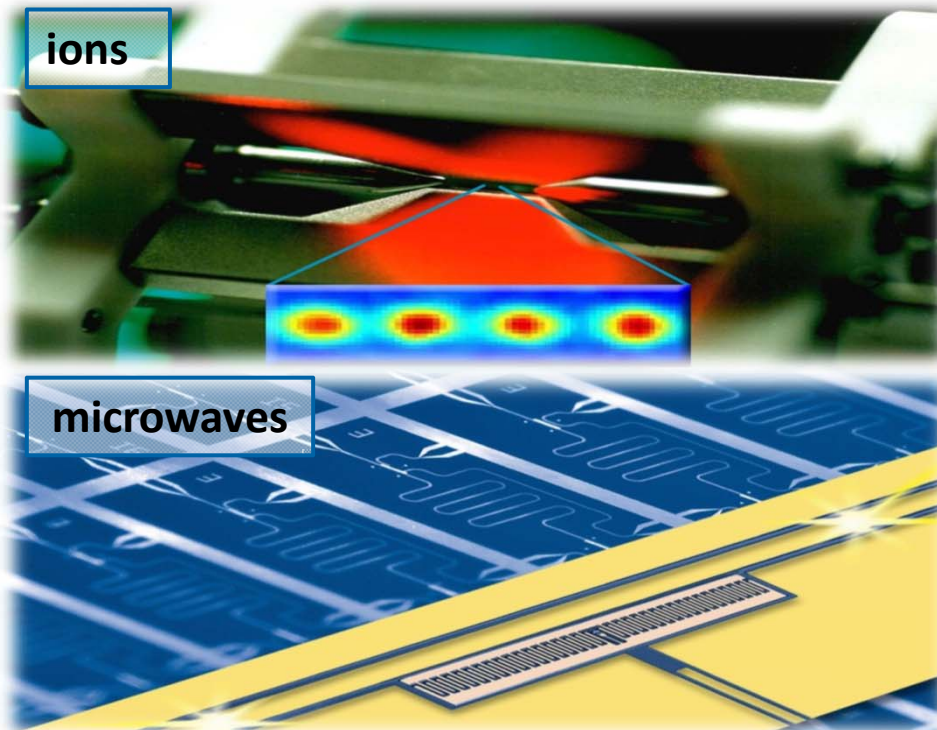
February 19, 2019



Erwin Schrödinger
Phil. Sci. 3, 233 (1952)

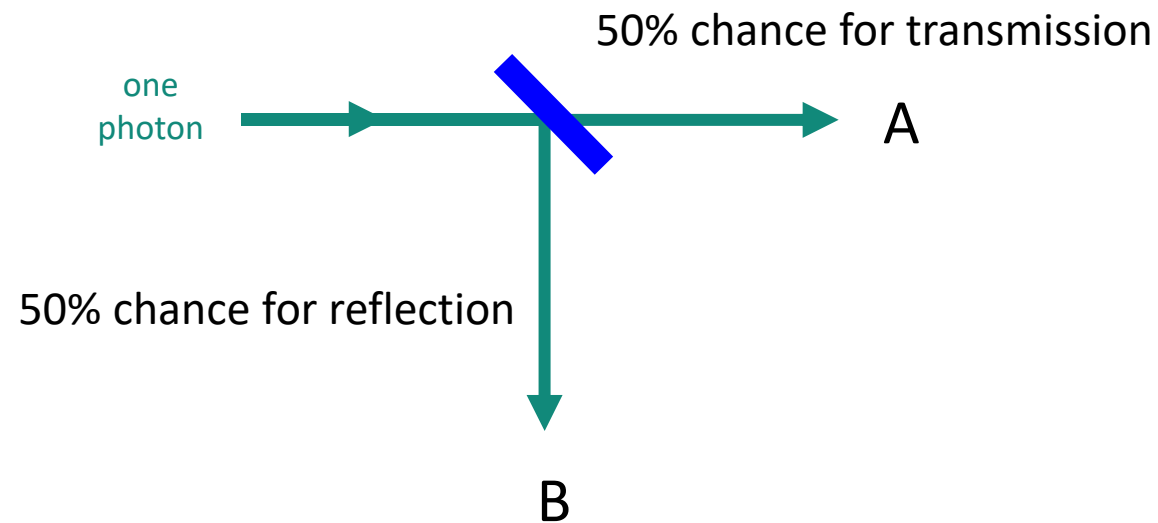
“We never experiment with just one electron or atom. In thought-experiments we sometimes assume that we do; this invariably entails ridiculous consequences... we are not experimenting with single particles, any more than we can raise Ichthyosauria in the zoo”

The 2nd Quantum Revolution – enabling radically enhanced technology



via the control of individual quantum particles for the exploit of
quantum physics phenomena

Superposition of a quantum particle

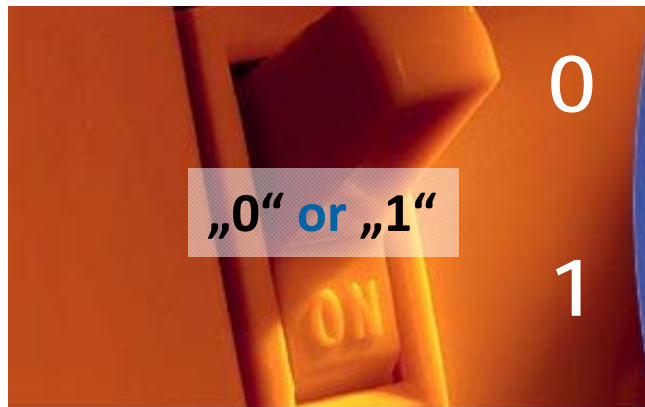


Quantum Physics:
Photon is at A and B simultaneously !

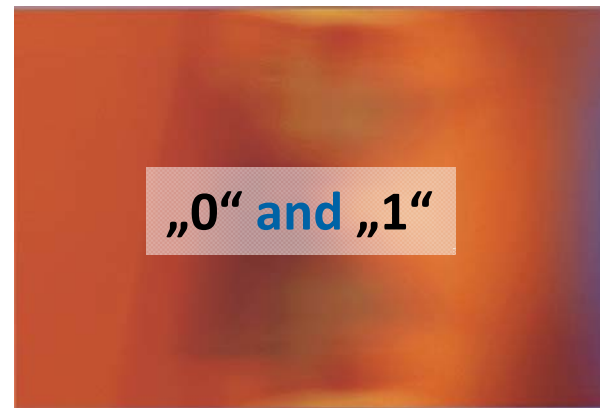
Quantum Internet –

Quantum Communication, Quantum Computing, Quantum Cloud

Bit



Quantum-bit



Quantum Communication: absolutely **secure transmission** of data (quantum cryptography)



Quantum Computing: **faster data processing** with respect to classical computers



Quantum Cloud Computing: absolutely **secure data processing** (data inaccessible to server)



Quantum Communication –

secure transmission of data



Architecture race for quantum computers

The Economist World politics Business & finance Economics Science & technology Culture

Quantum computers
A little bit, better

After decades languishing in the laboratory, quantum computers are attracting commercial interest

Jun 20th 2015 | From the print edition

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D-WAVE
The Quantum Computing Company™

IBM®

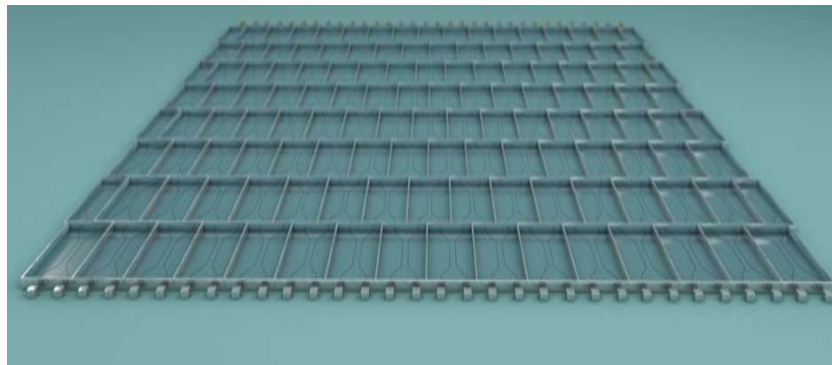
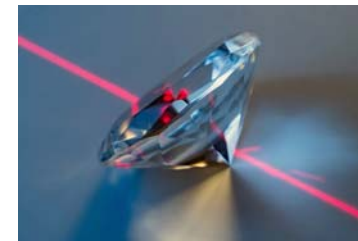
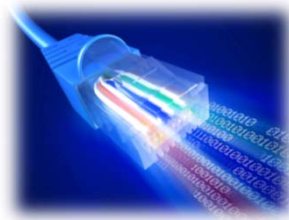
Google

intel

Photonic Quantum Computing

unprecedented security of data in delegated computer networks among other features

photons as information carrier for
transmission and processing



processing of single photons
using a photonic chip

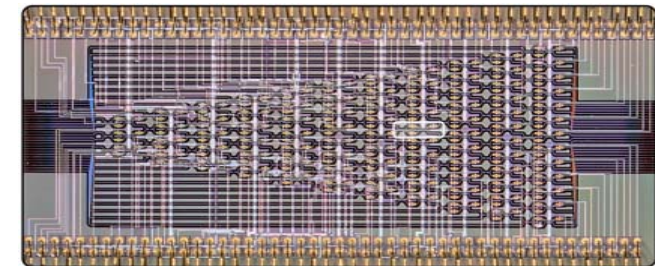
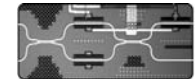


image of real chip
(manufactured by MIT)

The image is a horizontal composite. The left half shows a laboratory setting with a complex arrangement of scientific equipment, including various lenses, mirrors, and mechanical components mounted on a metal base. Numerous black cables are suspended from the ceiling, creating a dense web of lines. The right half features a stylized, glowing blue digital circuit or network diagram. A central square component, resembling a microchip or a small circuit board, is highlighted with bright blue light and surrounded by intricate, glowing lines that suggest data flow or connectivity. The overall theme is the intersection of physical science and digital technology.

The Transformative Impact of Excellent Science
exemplified by spin-off companies, etc.