Η ΕΝ ΑΘΗΝΑΙΣ ΦΙΛΕΚΠΑΙΔΕΥΤΙΚΗ ΕΤΑΙΡΕΙΑ
ΕΠΟΠΤΕΙΑ ΣΧΟΛΕΙΩΝ

2ο Παναρσακειακό Μαθητικό Συνέδριο

ΕΠΙΣΤΗΜΗ & ΠΟΙΟΤΗΤΑ ΖΩΗΣ

«Μέτρον άνθρωπος;»

ΠΕΡΙΒΑΛΛΟΝ - ΥΓΕΙΑ

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What Nanotechnology Is

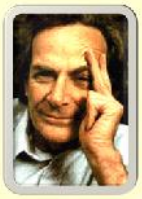
Kostas Poulantzas, Giorgos Stefadouros, Manolis Stylianakis,
Aggelos Tassopoulos, Vasileios Filipakopoulos
B΄ Lykeiou, A΄ Arsakeio Geniko Lykeio Psychikou
Advisors: Evdokia Patsilinakou (Chemistry Teacher PhD),
Maria Dimitropoulou (English Language and Literature Teacher)

FROM A 1960 SPECULATION TO THE 2012 NOBEL PRIZE IN PHYSICS

The speculation:

«What would happen if we could arrange the atoms one by one the way we want them?»

Richard P. Feynman, 1960

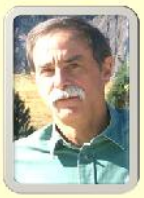


Richard Feynman

The 2012 Nobel Prize in Physics:

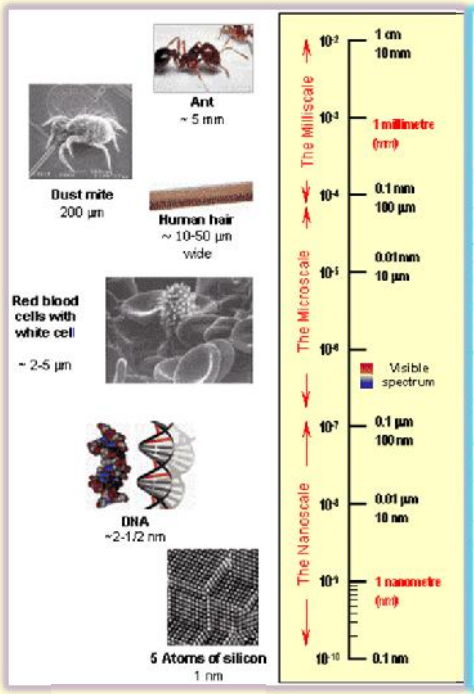
It was the French Serge Haroche and the American David Wineland who shared the 2012 Nobel Prize in Physics for the invention as well as the development of observation methods of microscopic quantum particles without destroying them. This was not possible before, as the notion that the quantum particles lose their mysterious quantum properties when they interact with the outside world prevailed.
Haroche and Wineland's discovery will lead to a new series of experiments in quantum physics and possibly to the creation of quantum supercomputers.

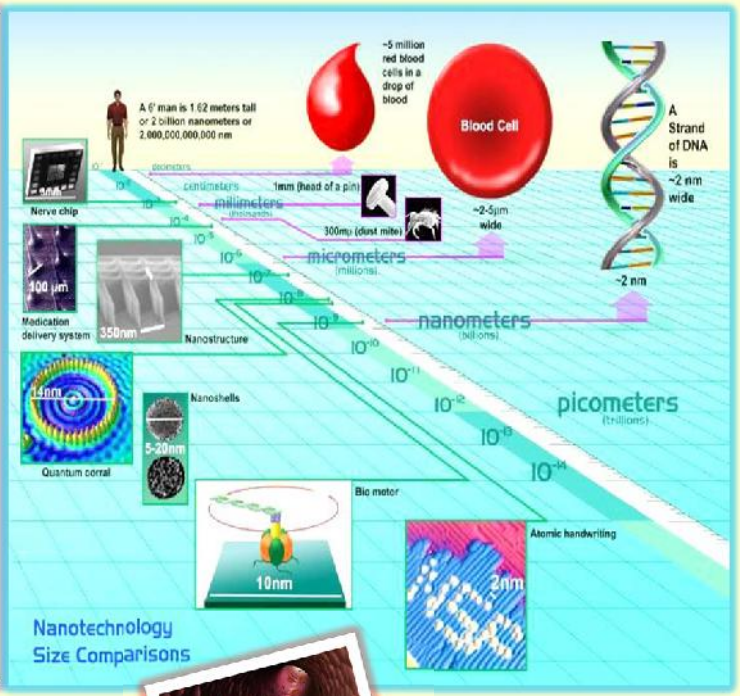
David Wineland

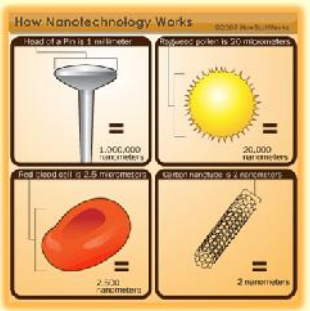


Serge Haroche

Nanotechnology **is the science which provides us with the ability to manipulate the structure of matter in a nanometer scale and has proven the impressive properties it acquires when its dimensions are just of a few nanometers. The prefix "nano" accounts for a size of 10^{-9}; that is, one nanometre (nm) is one billion times smaller than one meter (m). Thus we use the prefix nano, as in nanoparticles, nanofibrils, nanospheres etc.**







Travelling in the nanoworld:

- **the size scale changes**
- **gravity becomes negligible**
- **particles' movement is random (*Brownian motion*)**
- **the position of a particle is specified according to possibilities (*quantum uncertainty principle*)**
- **the atomic bonds determine the molecular shapes and properties**

If the Earth's diameter was 1 m, then a tennis ball would have a diameter of 1 nm!

We sincerely thank Ms Anna Christodoulou (Physicist) for her invaluable assistance.

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