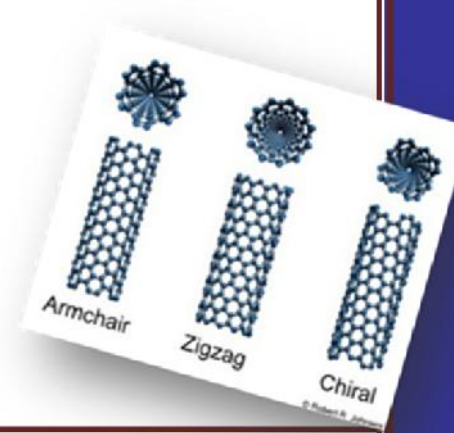


# ΠΩΣ ΜΟΡΙΑΚΟΙ ΝΑΝΟΙ ΜΕΤΑΜΟΡΦΩΝΟΝΤΑΙ ΣΕ ΤΕΧΝΟΛΟΓΙΚΟΥΣ ΓΙΓΑΝΤΕΣ

ΑΠΟ ΤΗΝ ΕΠΙΣΤΗΜΟΝΙΚΗ ΦΑΝΤΑΣΙΑ ΣΤΗΝ  
ΠΡΑΓΜΑΤΙΚΟΤΗΤΑ ΝΑΝΟΎΛΙΚΑ: ΧΗΜΕΙΑ - ΙΣΤΟΡΙΑ  
ΤΕΧΝΟΛΟΓΙΑ - ΤΕΧΝΗ

2012 - 2013

Ευδοκία Πατσιλινάκου - Μαρία Δημητροπούλου



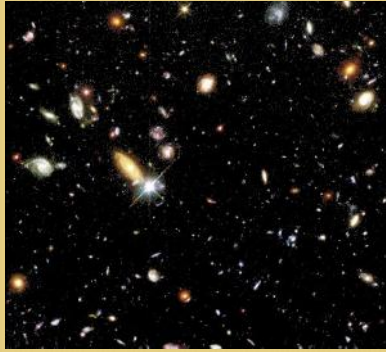
«...ένας από τους πιο ισχυρούς λόγους που  
οδήγησε τον άνθρωπο προς την κατεύθυνση  
της τέχνης και της επιστήμης ήταν  
να ξεφύγουν από την καθημερινότητα...»

*Albert Einstein*

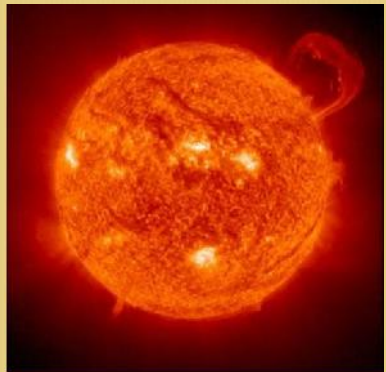
**Δείτε, θαυμάστε, ενθουσιαστείτε!**

**Μακρόκοσμος, μικρόκοσμος, ζωή!**

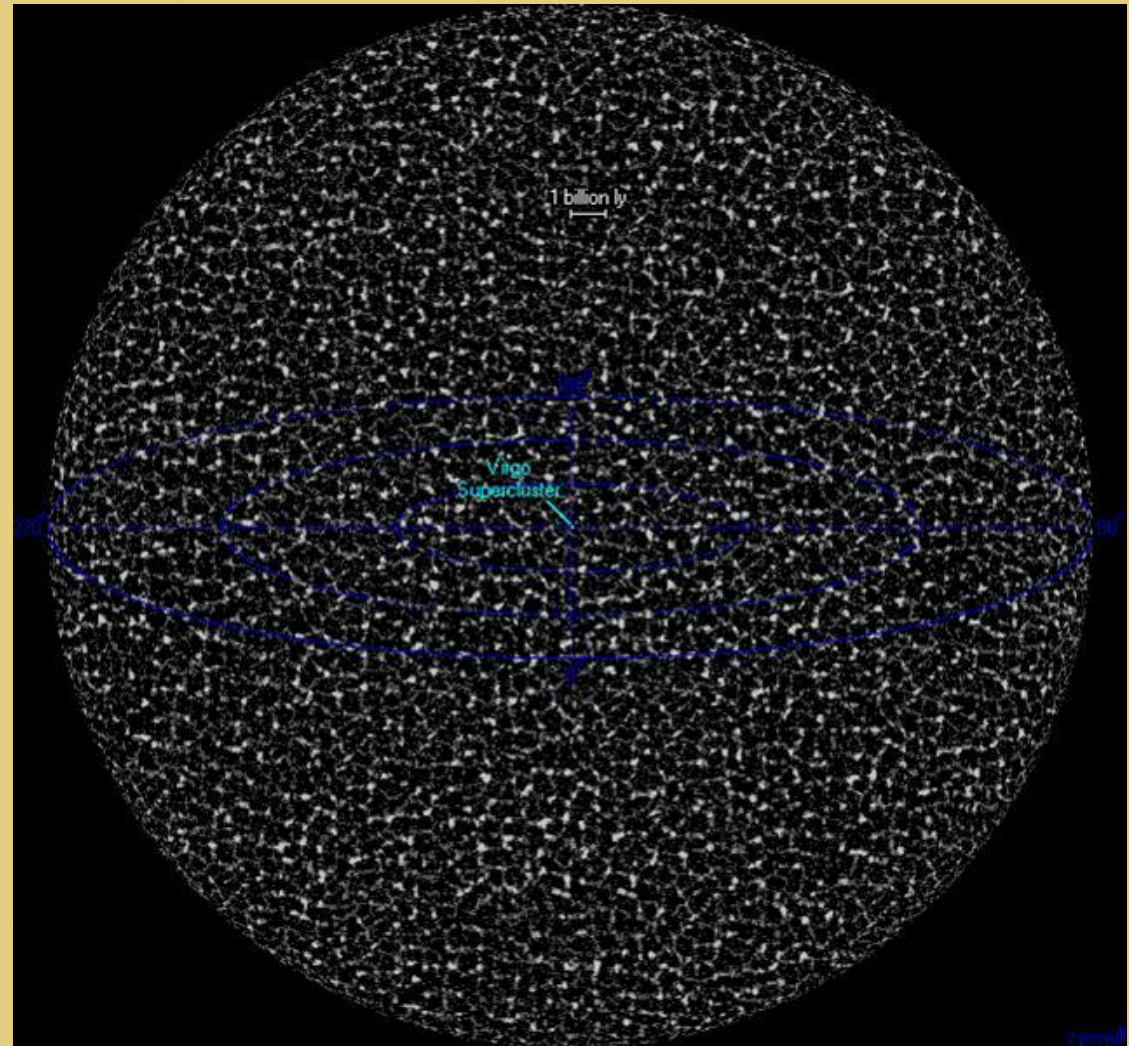
# Ο μακρόκοσμος



100 δισ. γαλαξίες με  
πέντε τρισ. αστέρια  
ο καθένας!



Ο ήλιος είναι ένα  
λαμπερό αστέρι!

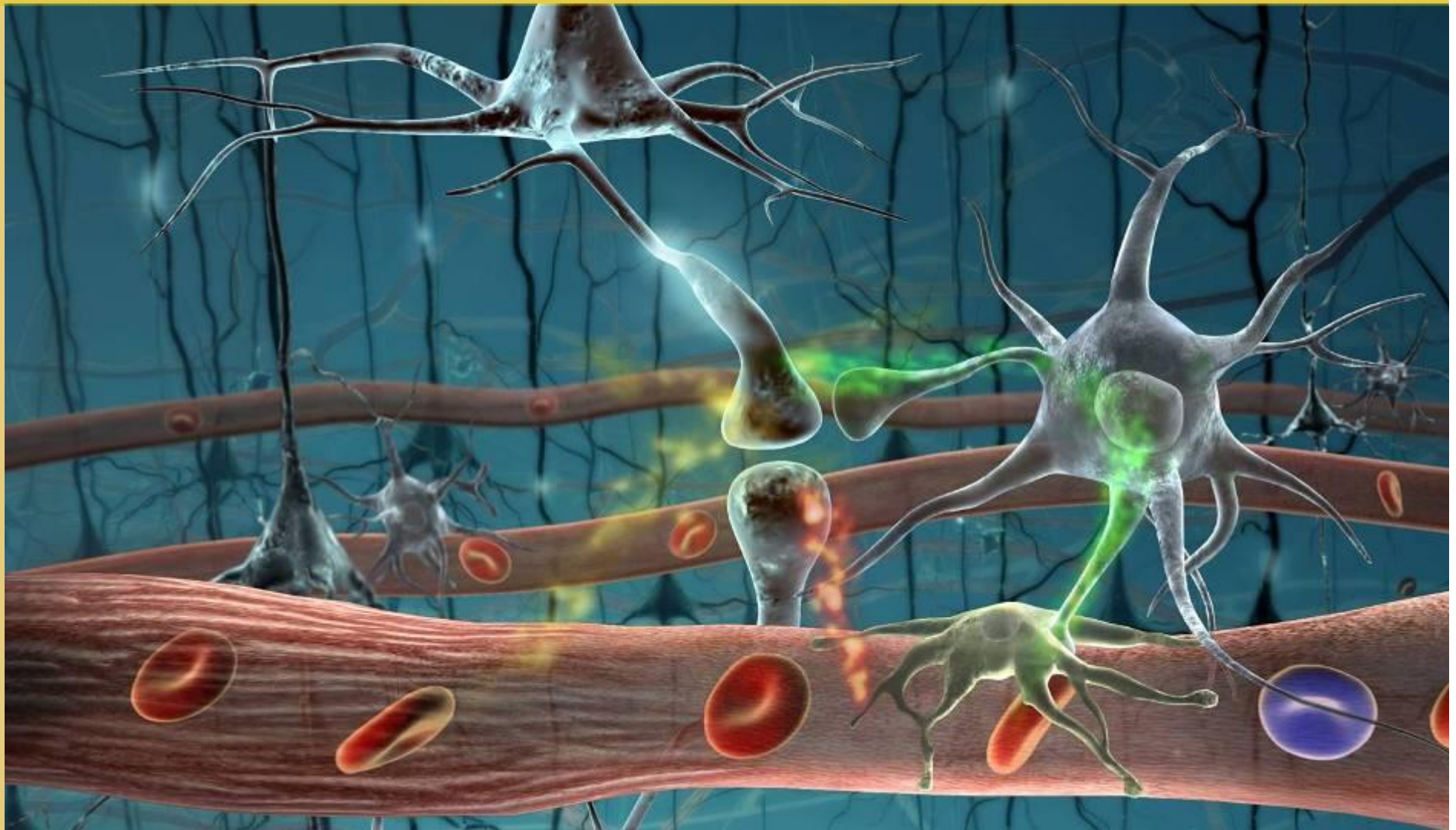


Το παρατηρήσιμο Σύμπαν: Μια σφαίρα με διάμετρο 28 δισ-εκατομμύρια έτη φωτός, η οποία περιλαμβάνει 15 τρισεκατομμύρια ήλιους. Το τρισεκατομμύριο είναι ένα 1, ακολουθούμενο από 21 μηδενικά (1.000.000.000.000.000. 000.000).



# Ο μικρόκοσμος

Το σώμα μας έχει 100 τρισ. κύτταρα που εργάζονται μαζί, έτσι ώστε να μπορούμε να ζήσουμε για δεκαετίες. Υπάρχουν εκατοντάδες είδη διαφορετικά κύτταρα - κάθε ένα με τη δική του λειτουργία, τη δική του ηλικία και τη δική του θέση στο σώμα - που βρίσκονται σε συνεχή επικοινωνία μεταξύ τους.





Η ζωή!











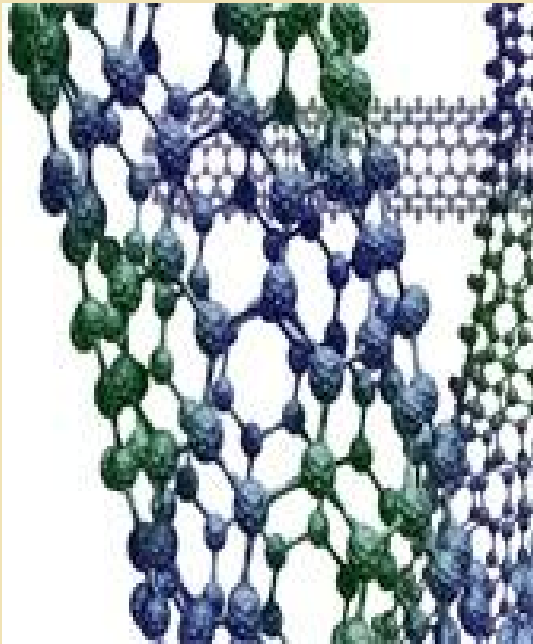
Η επιστήμη εμπνέεται  
από τη φύση...

Η τέχνη εμπνέεται  
από τη φύση...



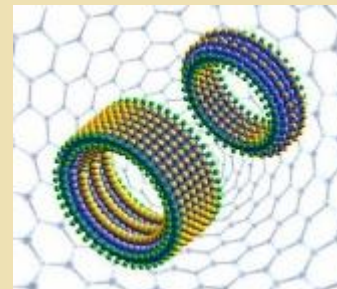


*Γιατί η δροσιά δεν μουσκεύει τα φύλλα;*

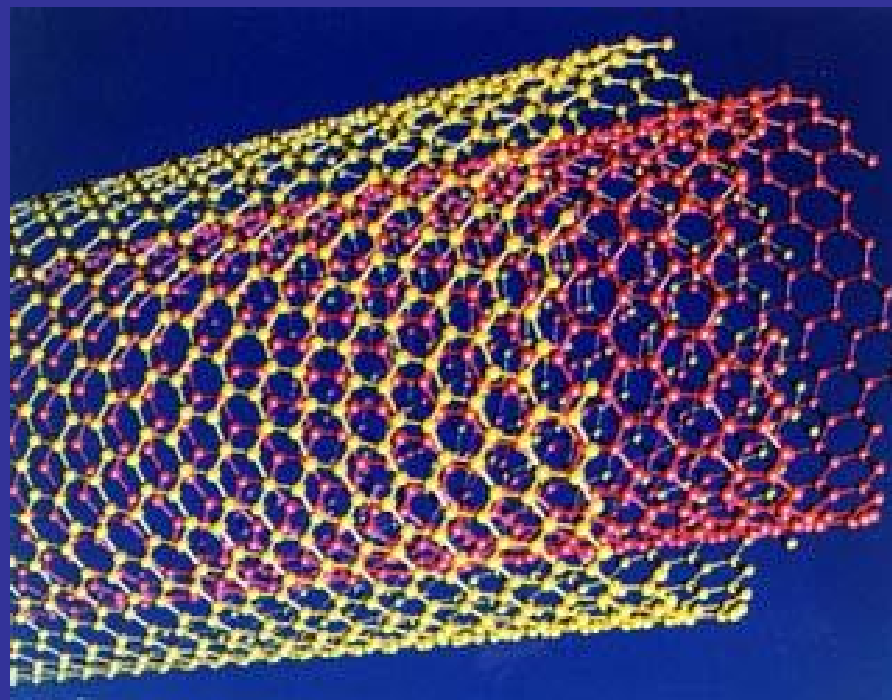


*Από μία έμπνευση και πολλές παρατηρήσεις  
γεννήθηκε η νανοτεχνολογία...*

*Ετοιμαστείτε να εκπλαγείτε...*

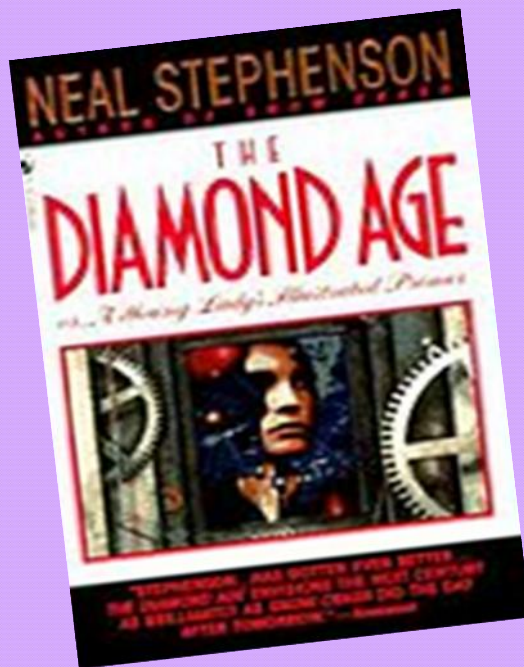


# Molecular Dwarfs Transformed into Technological Giants



A Arsakeio Lykeio Psychikou  
Evdokia Patsilinakou  
Maria Dimitropoulou





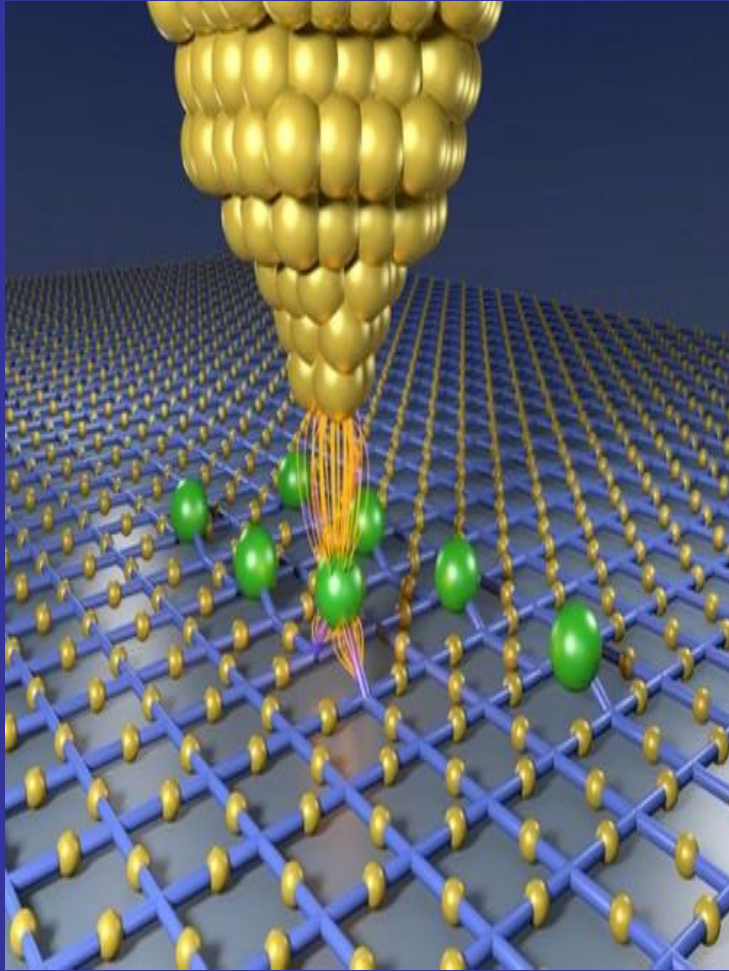
## English the universal language of science



- Adoption of a universal language of science
- Extraordinary effect on scientific communication  
scientific Literature  
scientists around the world
- Preparation of our students for the world of science



# Using English in the Project:



- research
  - papers
  - posters
- communication

**Therefore the students  
improved their**



**Reading skills**

**Writing skills**

**Listening skills**

**Speaking skills**



# Paper

## *‘Carbon Nanostructures’*

### Nuclear power

Eleni

Giamarellou

#### CARBON NANOSTRUCTURES RAISE MORAL ISSUES

The development of nano-science field and nanotechnology lead to the manifestation of issues belonging to the moral spectrum, which trouble scientists and audience alike. The main issue that concerns the deontology of N&N is dealing with possible dangers that occur or will be likely to occur from the various implementations of nanotechnology. Nano-materials could affect humans and the environment alike, positively by enhancing the quality of life, but negatively as well through various looming dangers.

The products and the processes of N&N are studied in chronologically different categories, so as to ensure the best approach possible when it comes to the potential implications they might cause and the ways to combat them.

These categories are:

1<sup>st</sup> generation (since 2000): Passive nanostructures, which are divided into two groups: free nanostructures or nanostructures in groups, such as aerosols, and products that involve nanostructures, such as nanoparticles or nanostructured metals.

2<sup>nd</sup> generation (since 2005): Active nanostructures, which are, also, divided in two subcategories: bioactive structures, such as targeted drugs, and structures whose function is based on physics and chemistry, such as sensors.

3<sup>rd</sup> generation (since 2010): Complete nano-systems, such as artificial organs.

# Poster

## ‘What Nanotechnology Is’

Mugiwara

Kostas Poulantzas,  
Giorgos Stefadourous,  
Manolis Stylianakis,  
Aggelos Tassopoulos,  
Vasileios Filipakopoulos



2ο Παναρσακειακό Μαθητικό Συνέδριο  
ΕΠΙΣΤΗΜΗ & ΠΟΙΟΤΗΤΑ ΖΩΗΣ  
«Μέτρον ἄνθρωπος»  
ΠΕΡΙΒΑΛΛΟΝ - ΥΓΕΙΑ  
Εκάλη, 13-14 Απριλίου 2013



**What Nanotechnology Is**

Kostas Poulantzas, Giorgos Stefadourous, Manolis Stylianakis,  
Aggelos Tassopoulos, Vasileios Filipakopoulos  
B' Lykelou, A' Arsakeio Geniko Lykelo 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?»

**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 their invention as well as the development of observation methods of microscopic quantum particles. This was not possible before, as the notion that the quantum particles lose their mysterious quantum character 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 to the development of quantum supercomputers.



Richard Feynman  
1960



Serge Haroche  
2012 Nobel Prize in Physics



David Wineland  
2012 Nobel Prize in Physics



Serge Haroche  
2012 Nobel Prize in Physics

**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

**References:**  
[http://inf.stanford.edu/Education/Nanotechnology/SHF\\_vchb.pdf](http://inf.stanford.edu/Education/Nanotechnology/SHF_vchb.pdf)  
<http://ec.europa.eu/health/opinions2/en/nanotechnologies/1-3/1-introduction.htm>  
<http://www.nano.org.uk/what-is-nanotechnology>  
<http://www.nnin.org/news-events/spotlights/what-nanotechnology>



## Presentation

*‘Nanomedicines in the Fight against Cancer: the Present and the Future’*

Chem Leaders

Konstantina Skliami

## Why common anticancer medicines have negative effects?

These treatments target the cancer cells but unfortunately they destroy healthy cells at the same time .



Normal cells that are likely to be affected are those that divide rapidly, such as those found in bone marrow, in the mucosa of the gastrointestinal tract, reproductive system and hair follicles.

- ✓Aggelos Tassopoulos – Mugiwara
- ✓Konstantinos Kalogeropoulos – Master Chem
- ✓Eleni Giamarellou– Nuclear Power
- ✓Dimitris Michopoulos –
- ✓Haroula Sfetsa – Chem Leaders





*Στην περιήγησή μας στον νανόκοσμο  
μας συνόδεψαν:*

*Ιωάννης Αραμπατζής, Τάκης Βιδάλης,  
Ουρανία Κούμη, Γιώργος Μούσδης,  
Νίκος Ταγματάρχης, Ιωάννα Φασάκη,  
Άννα Χριστοδούλου*

*τους ευχαριστούμε από καρδιάς!*