



National Academies Symposium on Management of Intellectual Property in Standards-Setting Processes

Session 6- Standards Development in Emerging Technologies - Nanotechnology

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What is Nanotechnology?

Nanotechnology is the understanding and control of matter at the nanoscale, at dimensions between approximately 1 and 100 nanometers, where unique phenomena enable novel application

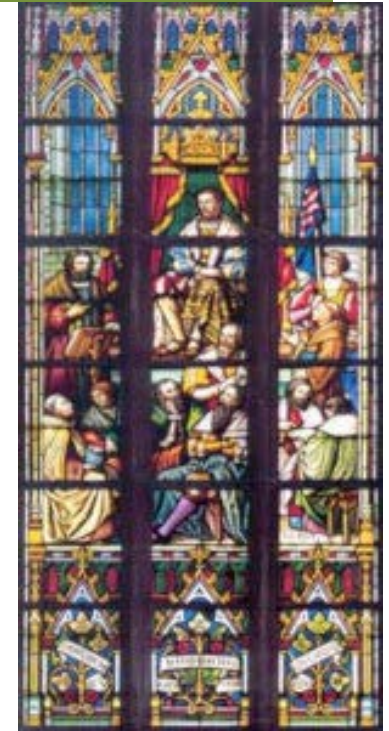
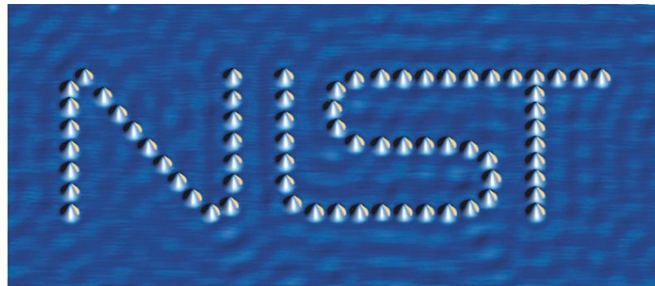
National Nanotechnology Initiative

- There are 25,400,000 nanometers in an inch
- A sheet of newspaper is about 100,000 nanometers thick



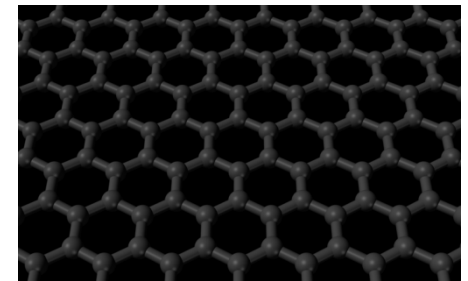
DAMASCENE STEEL

Courtesy: Rahil Alipour Ata Abdi
Wikimedia Commons



MEDIEVAL STAINED GLASS WINDOW

Courtesy: NanoBioNet and
www.nano.gov



GRAPHENE LAYER

Standards Matter



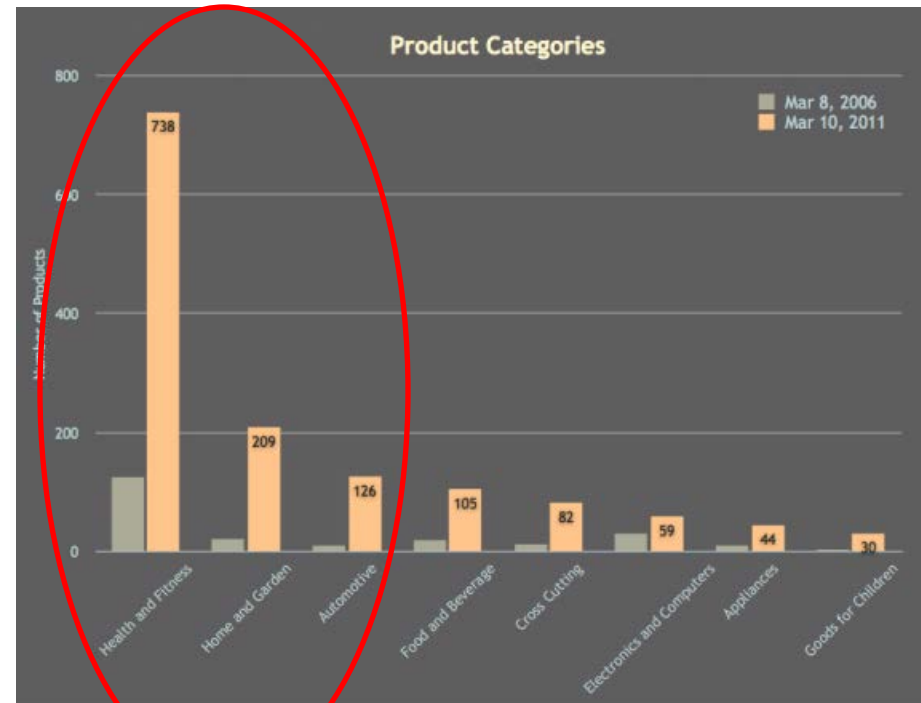
Courtesy: www.treehugger.com

Growing ubiquity

According to The Project on Emerging
Nanotechnologies**

(http://www.nanotechproject.org/inventories/consumer/analysis_draft/):

- 1300+ nano- based/containing products (as of March, 2011)
- Categories:
 - 738 in Health and Fitness
 - 209 in Home and Garden
 - 126 in Automotive
 - 105 in Food and Beverages
 - 82 in cross-cutting applications
 - 59 in Electronics and Computers
 - 44 in Appliances
 - 30 in Goods for Children



Drivers for Nanotechnology Standardization

Ubiquity of nanotechnology and nanotechnology enabled products

- Are they safe
- Consumer confidence
- Regulations – use of standards can ease implementation and compliance

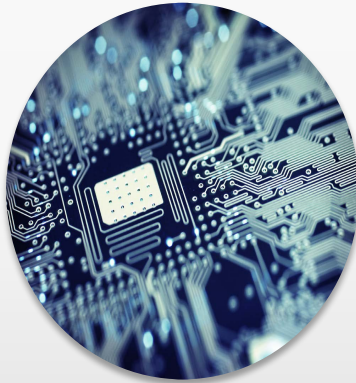
Trade: projections of 100s of millions - billions of dollars of global trade in nanotechnology

Innovation: new products/applications requiring new measurement techniques

Impact of Nanotechnology Standardization



Trade



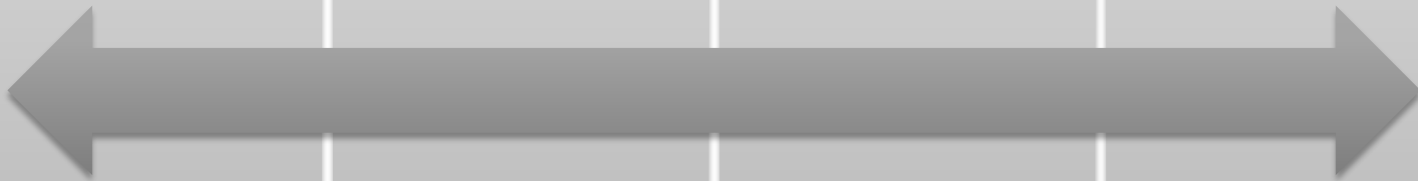
Technology



Innovation



Competition



Nanotechnology Standardization

Benefits:



- ☐ Address important questions – e.g., is it safe, what to measure, how to measure?
- ☐ B-2-B efficiencies
- ☐ Supports technology development
- ☐ Enables product innovation
- ☐ Help with regulatory compliance

Challenges:



- ☐ Right time to standardize?
- ☐ Prioritization
- ☐ Competing user demand
- ☐ Availability of robust underlying data
- ☐ Availability of skill and expertise

Standards Development for Nanotechnology

- Standards development in different types of organizations
 - Global participation
 - Regional
 - National
- Different participation models
- IP in standards development

IP in Nanotechnology Standardization

- Early stages of technology standardization
- Standardization efforts focused on:
 - Terminology, nomenclature, definitions
 - Measurement techniques – how to measure, what to measure
 - EHS aspects – data and frameworks to answer “is it safe”
 - Performance characteristics
- IP, specifically patents are not a significant focus in standardization
 - ASTM E2456-06: Standard Terminology Relating to Nanotechnology - available for download at no cost
 - ISO TC229 terms and definitions can be browsed on ISO Online Browsing Platform (previously, ISO Concept Database):
<http://www.iso.org/obp/ui/>
 - Not aware of any patented technology being incorporated or being considered for incorporation in these activities

Future of IP Treatment in Nanotechnology Standardization

How nanotechnology standardization may evolve:

- Greater incorporation of nanotechnology into consumer products
 - Will drive nanotechnology standardization
 - More of patented technology likely being brought into standardization
- Evolution of nanotechnology and associated R&D:
 - Drives nanotechnology state-of-art further along the innovation chain
 - More patenting and availability of patented technologies - fundamental and applied
- Business models:
 - Monetization of patents
 - Patents for cross-licensing
- LESSONS LEARNED FROM OTHER TECHNOLOGIES