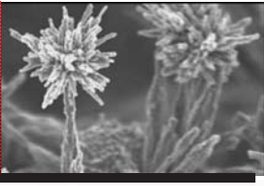
INSIGHT

Anticipating the Future... Assessing the Impact

IPRO 341 Nanotechnology



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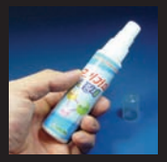
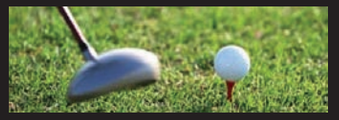
What is nanotechnology?

Nanotechnology is based on the nanoscale (1/1,000,000,000 of a meter). Scientists are able to construct things from the ground up, by organizing atoms together one by one, until a larger object is made.

Existing nanoproducts





Collaboration with Ball State

The Beginnings...

The concept of collaboration between BSU and IIT was discussed between the two faculty members, George Elvin and Janet Staker Woerner. They both felt strongly about the promise of nanotechnology, but what remained was how to integrate this into university level programs as well as the consideration of the much wider societal impacts. These discussions ultimately led to an agreement to collaborate for the fall.

Objectives

1. Identify nanotechnology concepts and the properties of the materials that the BSU students planned to incorporate into their designs.
2. Detail the possible technical obstacles when integrating these materials in to real-world architecture designs created by the BSU students.
3. Research, identify, and analyze societal issues.
4. Detail the collaborative process with off-site team members separated not only geographically, but also in terms of technical and aesthetic knowledge bases.
5. Construct recommendations pertaining to the future of nanotechnology and its integration into society.
6. Apply collaboration and communication tools.

Societal Issues

- **Cost Efficiency and Resourcefulness**
- **Societal Reaction to Malfunction**
- **Worker Safety and Education**
- **Student Education**
- **User Education**
- **Governing Body Structure and Education**
- **Durability and Sustainability**
- **Compatibility**
- **Privacy/Hacking**
- **Job Market**
- **Recyclability**
- **Toxicity**

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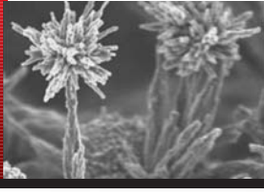
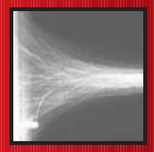
Nanostudio



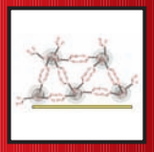
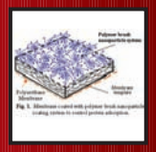
Nano-Materials

Carbon Nanotubes (CNTs)




Organic Light Emitting Diodes (OLEDs)


Nanosensors

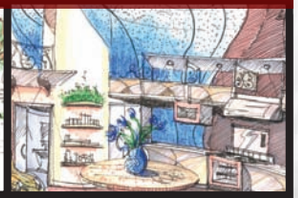



Quantum Dots

Nanowire Paper

Nanosteel


Team NanoShell

Materials:
Nanosteel and Nanosensors

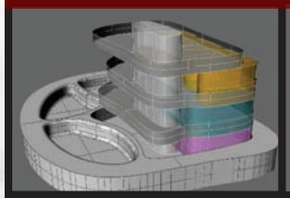
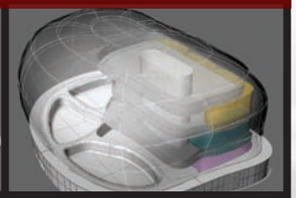
Technical Issues:
Acoustics and Heat
Electromagnetic Effects

Team 3884


Materials:
CNT Sheets and Quantum Dots

Technical Issues:
Limitation of Length
Limitation of Synthesis

Team Nanospa

Materials:
CNTs and Nanosensors

Technical Issues:
Elasticity of Envelope
Elasticity of Screen
Structural Issues
Aerodynamics

Team Fleischman

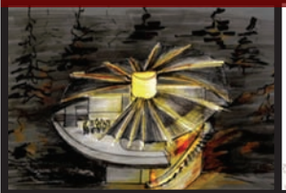

Materials:
CNT Sheets and OLEDs

Technical Issues:
Structural Limitations
Heat/Energy Inefficiencies
Molecular Stability
Privacy Issues

Recommendations for Technical Issues

- Use of a Lightening Rod
- Accordion-like Structure
- Added Support Beams
- Additional Foundation Anchors
- Clear Insulating Materials Around Transparent Walls
- Protective software
- Override Panels Inside the House
- Backup Power Supplies/Generators
- Coat Hydrophilic Materials

Team Natural Umbrella




Materials:
Nanowire Paper, Quantum Dots, and Nanosensors

Technical Issues:
Hydrophilic
Combustive Properties
Minor Electrocution

***These designs were created based on the assumptions that they would be viable in 25 years from 2006.**

Conclusions

- Insufficient education (consumers, workers, etc.)
- Few standard governmental or non-governmental institutions
- Best practices for research are inadequate
- Insufficient safety regulations
- Little specification for amounts, delivery, or recycling
- Public misconceptions of nanotechnology
- Possibility of control issues from computer interfaced nano-based technology
- Durability, sustainability, and recyclability risk assessment is incomplete
- Toxicity has already been identified as a major problem
- Lots of promises, but even more questions