Science and Technology Studies 201, Section 84405 Nanotechnology and Society

Course Website: <u>http://tahan.com/charlie/nanosociety/course201/</u>

Class 6. Nanotech in Culture 1.

Class survey, questions.

Comments:

More discussion, less lecture.

The first week we were mostly doing review and reading. Now the course becomes more discussion based.

I thought it would have been helpful to learn more about projected business trends and how nanotechnology will affect the economy etc. before we wrote our McKinsey essays.

Whoops.

I want to learn more about Nanomedicine.

You will.

I'm unclear on what we'll be tested on.

We'll talk about it in class when the time comes. It will be a combination of general nano knowledge and some of the science and technology studies concepts we'll cover.

I think it would be interesting to know more about what's actually happening with nanotech currently.

We will.

Questions:

How do you make nanobots? What could they do?

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No one knows. That's part of the critique. Few researchers or companies are seriously pursuing sophisticated nanobots just because they are presumed to be so far away. Many scientists consider them fantasy at the moment but one place to look on the web for more information is Drexler's <u>Forsight Institute</u>.

How far away are we from manufacturing nanoparticles on a commercial scale?

We're there. <u>Quantum Dot Corporation</u> is one example of a company making such nanoparticles.

Who thought of nanobots?

Eric Drexler is given much of the credit (or shame) for thinking up nanobots. His books, Engines of Creation and Nanosystems, are the place to go to find more about his ideas. He also has a website.

What, if any, aspects of nanotechnology are being used for prediction and/or research of weather phenomena?

Tough questions. I don't really know at the moment. Why not do some research on it. Quantum dots and nanoelectronics will improve imaging technology (interferometers on satellites for example). People have also thought about putting arrays of sensors in a tornado to understand its dynamics. These wouldn't likely be nanoscale however.

What classes and things can we get involved with to get more knowledge about nanotechnology?

We'll spend a class looking at who is working on nano-related research at the UW. I think the engineering department is arranging a new specialty on nanoscale engineering. Ask me about career options sometime.

I've seen a conceptual motor made out of atoms in my general chemistry book from UW-Oshkosh. How can the molecules keep from crystallizing?

Generally, molecular-manufactured devices must behave the law of physics. This means that the bonds that form the motor must be stronger (more energetically favorable) than any other structure, say the crystal form, that molecules may also be capable of arranging themselves in. It's easy enough to make a pretty picture of molecules forming a motor, who exactly the place and arrange them is much more difficult.

What exactly are quantum dots and nanotubes used for?

Big question. Quantum dots in the form of nanocrystals have been used as imaging agents (for medical purposes), for catalysts in chemical reactions, in bombs. Nanotubes are promising in electronics and have begun to be used in fabrics and composites to increase strength.

Would methane gas be considered nanoparticles? Because these would only be a few atoms in size. I remember that nanoparticles can get through the blood-brain barrier, so can methane? What about other compounds like NaCl?

No. Methane gas is a gas. Generally, nanoparticles consist of hundreds of atoms in a crystal structure. NaCl is a crystal and is found in nanocrystal form. It's water soluble though.

I would like to know more about the science of nanotech. I want to know exactly what kind of effects do quantum physics have on small particles. What are these new properties?

We'll get to this.

Is inter-nanoparticle communication possible? How?

Only in the movies. Nanoparticles at present are just crystals, they have no internal device structure. That said, communication can only happen a number of ways, by light, sound, chemicals.