Teaching a course on ethics in nanoscience: some rights-based issues

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MSEG 443 Ethics in Nanoscience

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&

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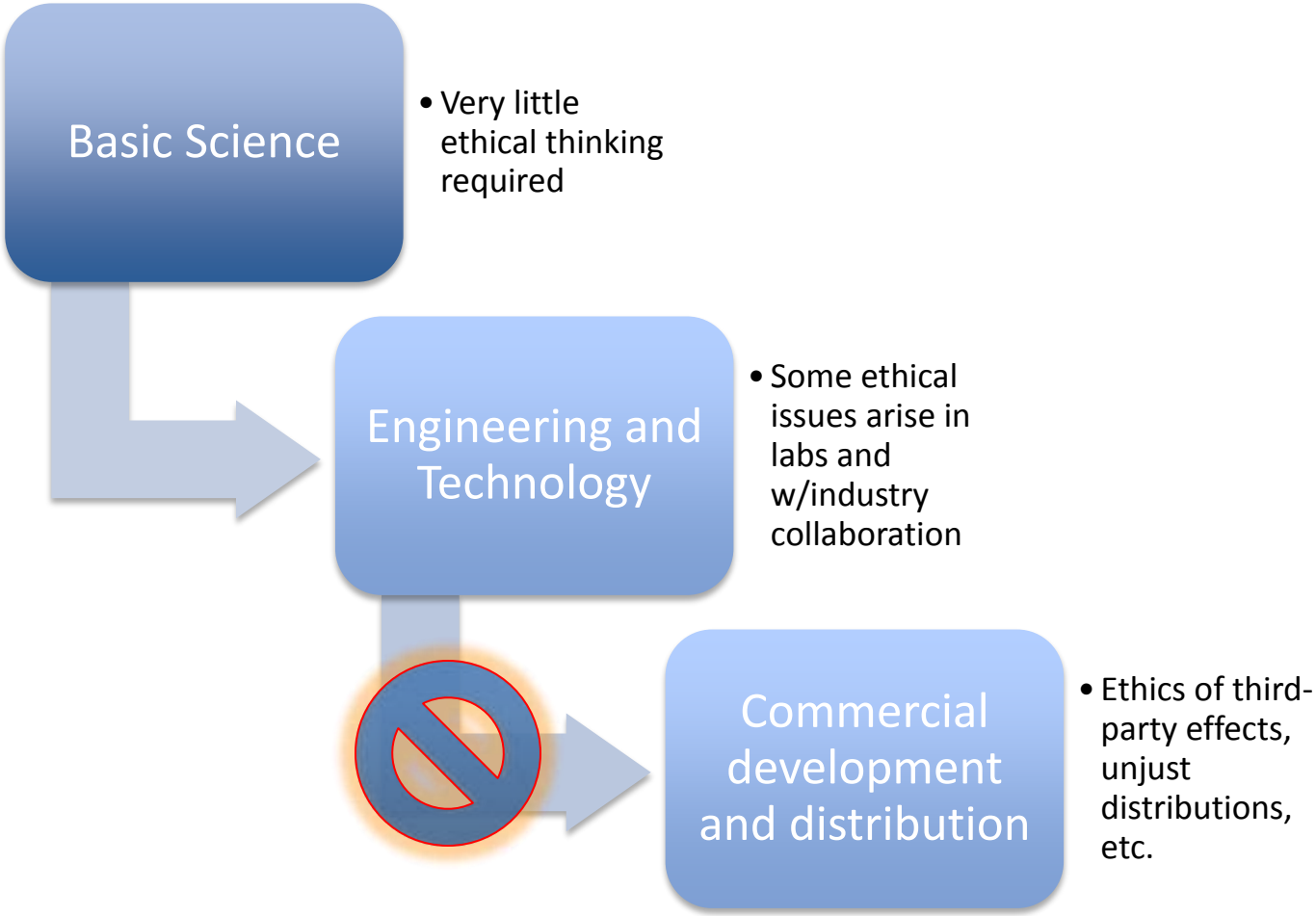
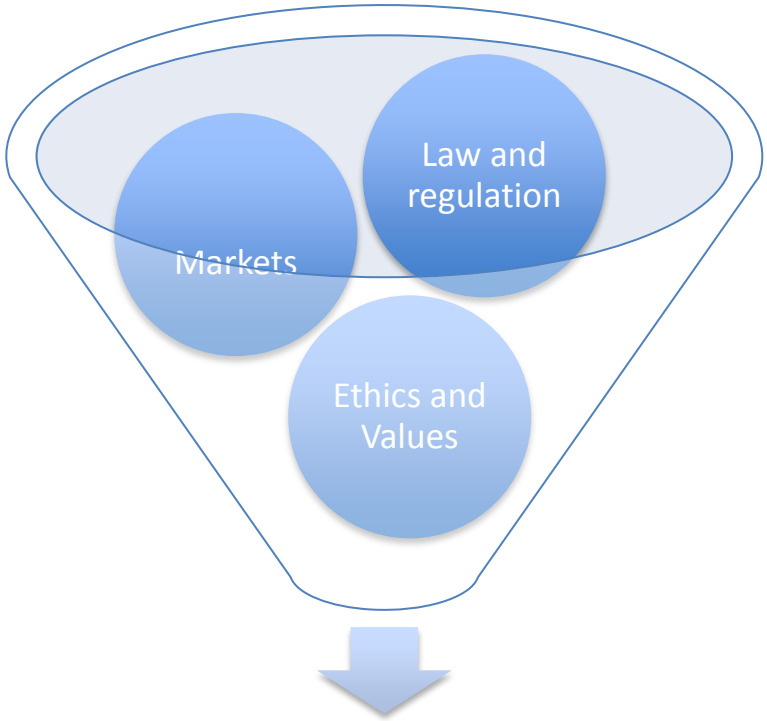
5 Major Components of MSEG 443

- Basic ideas of nanoscience
- Recent developments in nanoscience
- Theories of ethics and applied (e.g., environmental, business, research) ethics.
- Case studies
- Workshop in Nanoethics

The basic issue: what is the filter between science/engineering and commercial development and distribution?



What makes up these “filters”?
How do they vary?
What gets through and what gets stopped?



Production and Distribution

The benefit of early consideration of ethics: to help us choose *good* technologies and distribute them appropriately

Some human rights considerations for nanotechnologies

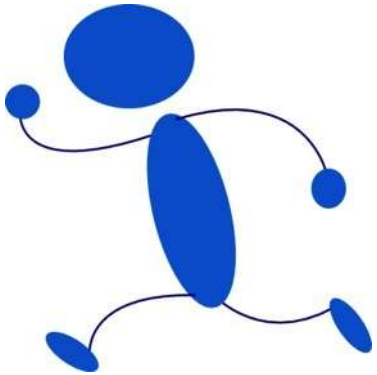
- Could individual privacy rights be harmed by NT surveillance devices?
- If scarce resources are used to deliver nonessential goods (e.g., physiological/cognitive human enhancement), are basic needs/rights ignored?
- Will NT pollution from production/consumption be left for future generations to clean up?
- Could NT for environmental remediation cause more environmental stress—and who's remediation counts more ?

What ethical responsibilities do scientists and engineers have?

- Our state of partial ignorance: not much is known about important factors for NT development: NP fate, transport, life-cycle, reactivity, toxicity.
- Ought implies can! Moral obligations on scientists apply only to the extent that they *can* know enough to protect the public.
- Willful ignorance is not a good excuse! Effects on human health and environment must be researched along with basic science and engineering.

An analogy for thinking about risk and precaution:






Nanotechnology has much promise to create profits and provide solutions for energy, water, medicine, IT, and other needs.

We know very little about the “worst-case scenario” for NT.

The choice between “go slow” and “go fast” must consider public perception and acceptance.

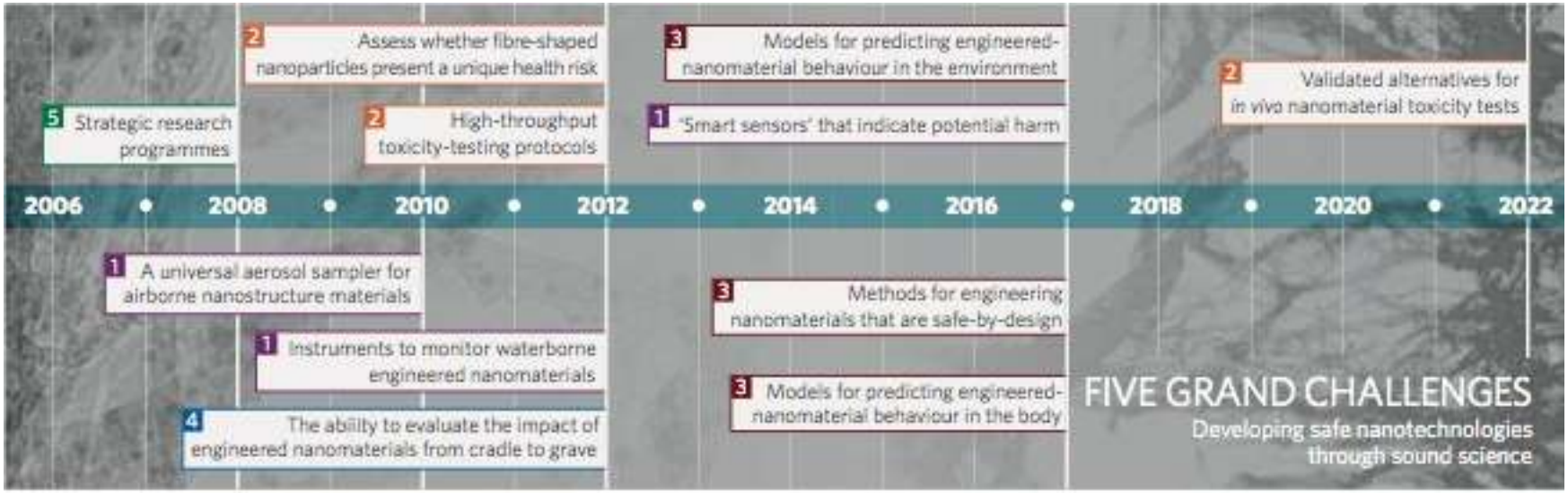
Some benefits of NT seem trivial—but profitable!

Falling behind in the “grand challenges” of safe nanotechnology

Nanotechnology is a reality now, and our ability to produce ever-more sophisticated materials, processes and products by engineering at the nanoscale will only increase over the coming years. Yet our understanding of the potential environmental, safety and health impacts of these emerging technologies is rudimentary at best.

Andrew Maynard, “Research on environmental and safety impacts of nanotechnology: what are the federal agencies doing?” (Testimony before the U.S. House of Representatives Committee on Science, 9/26/11)

Maynard, et al. “Safe handling of nanotechnology” *Nature* 2006



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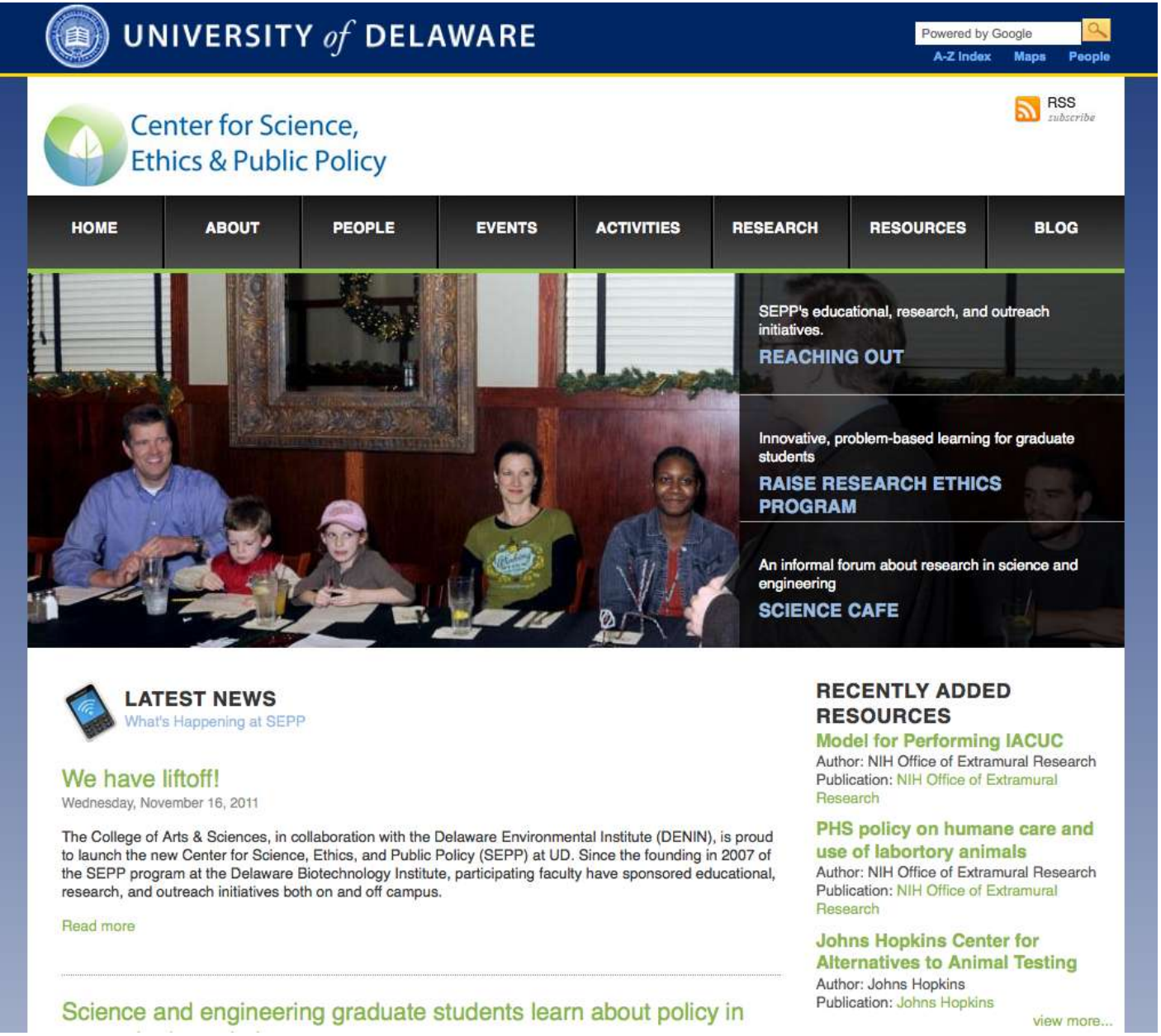

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