

STS-284-01

MOLECULAR COORDINATES

THE SOCIETAL IMPLICATIONS OF EMERGENT NANOTECHNOLOGIES
FALL 2008
NE 107
M, W 9-10:15am

Professor Michael G Bennett
Office: New England, 202
Office Hours: M, 10:15-11:25a;
Tu, 10:00a-12p; by appointment
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*"I say!" murmured Horton. "I've never heard tell
of a small speck of dust that is able to yell . . ."
Suess¹*

a

This course is designed to enable you to analyze dynamics and relationships germane to the domestic emergence of nanotechnological and nanoscientific research and development from approximately 1980-2003, and, in turn, the enmeshed ethical, societal, legal, martial, political and imaginary implications they suggest. Our *main* entry point into these examinations will be science fiction—understood conceptually, through particular paraliterary examples, and secondary works—however we will digest a broad, diverse sampling of the literature genres coordinating the nanotechnological (think of these as our data) and our course's vitality and ultimate cash value will depend on our close, critical readings of these texts.

b

Please attend class prepared to discuss in detailed depth the texts noted under the appropriate date on the Reading Calendar below (i.e., in week 2 (09.08 & 09.10), on Monday come to class prepared to discuss all the readings listed for that week.).

¹ All of your writing should cite sources and list references in accord with the MLA Style Manual. So, for example, the proper citation for the source associated with this footnote would be: Suess, Dr. (1954). *Horton Hears a Who!* New York: Random House. On the importance of citation to your education at Vassar, see the 2003 revised edition of *Originality & Attribution: A Guide For Student Writers at Vassar College*.

In addition to the texts we will access electronically, there are four required texts you should purchase:

1. Drexler, K. E. (1986). *Engines of Creation: The Coming Era of Nanotechnology*. New York: Anchor Books. (Hereinafter “Drexler (1986)”)
2. Bear, Greg (1993). *Moving Mars*. New York: Tor Books. (Hereinafter “Bear (1993)”)
3. Stephenson, N. (1995). *The Diamond Age; or, A Young Lady’s Illustrated Primer*. New York: Bantam Books. (Hereinafter “Stephenson (1995)”)
4. Crichton, Michael (2002). *Prey*. New York: HarperCollins. (Hereinafter “Crichton (2002)”)

c

Scoring and final marks are based on the following point distribution:

20 points	— Attendance
20 points	— Class Participation
10 points	— Essay 1
20 points	— Essay 2
30 points	— Essay 3
100 points	— Total

Participation and attendance are self-explanatory. The written assignments will comprise three essays, the first 1000 words in length, the second running approximately 2000 words, while the third should be approximately 3000 words. **The first essay is due 09.29** and should discuss the various ways Drexler (1986) reads as “science fiction.” **The second essay is due 10.29** and should discuss (i) Bear (1993) within the context of Delany (1969) and Suvin (1974), and (ii) speculate on how the domestic emergence of nanotechnology might have gone differently if Feynman (1959) had been replaced by Bernal (1929). In **the third essay**, which is **due 12.10**, discuss what you consider to be the most significant ethical, legal and/or political implication of “nanotechnology,” and whether science fiction generally, or the subgenre of nano-sf has a meaningful role to play in public education, university education and/or science and technology policymaking. The essays must be typed, double spaced, Times New Roman, inclusive of a consistent citation system and a reference list. The essays will be marked on the basis of structure, style, inclusiveness of readings and class discussions, proper citation and imaginativeness.

d

Readings should be completed by the dates with which they are associated below. With minimal deviation, our reading-based discussions should unfold as follows:

Part 1: Initial Conceptualization, Nominal Demarcations & Mascots

Week 1: Introduction
09.03

Orientation and Introductions

Week 2: 09.08 & 09.10

Drexler (1986: Forward, Glossary, Part 1)

Richard Feynman (1959), "There's Plenty of Room at the Bottom."

Michael Berry's (1991) "The Creator."

McCurdy (1995), "Fiction and imagination: how they affect public administration," *Public Administration Review*, vol. 55. No. 6.

Week 3: 09.15 & 09.17

Drexler (1986: Part 2)

Drexler (1988) "A Dialog on Dangers; Originally Published in 1988"

Rudy Baum (2003), "Nanotechnology: Drexler and Smalley Make the Case For and Against 'Molecular Assemblers,'" *Chemical and Engineering News*, vol. 81, no. 48. (Chemical and Engineering News (<http://pubs.acs.org/cen/>) archive)

Rice, News & Media Relations (2005), "Nanotech Pioneer, Nobel Laureate Richard Smalley Dead at 63."

Week 4: 09.22 & 09.24

Drexler (1986: Part 3, Afterword)

Ed Regis (2004) "The Incredible Shrinking Man," *Wired* 12.10. (wired.com archive)

Lawrence Lessig (2004) "Stamping Out Good Science," *Wired* 12.07. (wired.com archive)

Editors (2004), "The Nanotech Schism," *The New Atlantis*, no. 4, Winter. (thenewatlantis.com)

Part 2: Technoscientific Divides, Science Fictional Effects

Week 5: 09.29 & 10.01

Bear (1993: 1-136 (approx.), or 1st third; whichever is longer)

Delany (1969), "About Five Thousand One Hundred Seventy-Five Words," *Extrapolation: A Science-Fiction Newsletter*.

Suvin (1979: Preface, chaps 1 & 4), *Metamorphoses of Science Fiction*.

Week 6: 10.06 & 10.08

Bear (1993: 137-272 (approx.), or 2nd third)

Delany (1999), "Future Shock," *Village Voice*. (Villagevoice.com archive)

ETC Group (2005), "A Tiny Primer Nano-Scale Technologies and 'The Little Bang Theory'."

Week 7: 10.13 & 10.15

Bear (1993: remainder)

Bernal (1929), "The World, The Flesh and The Devil: An Enquiry Into the Future of the Three Enemies of the Rational Soul." (cscs.umich.edu/~crshalizi/Bernal/)

Winner (2003), "Testimony to the Committee on Science of the U.S. House of Representatives on the Societal Implications of Nanotechnology."

Part 3: Socio-Political Striations, “Nanoethics,” Enterprised-Up Molecular Configurations

Week 8: No class meetings . . . so read ahead on 10.20 & 10.22

Week 9: 10.27 & 10.29

Stephenson (1995: 1-140 (approx.), or 1st third; whichever is longer)
Lopez (2004), “Bridging the Gaps: Science Fiction in Nanotechnology,” *HYLE*.
Berne & Schummer (2005), “Teaching Societal and Ethical Implications of Nanotechnology To Engineering Students Through Science Fiction,” *Bulletin of Science, Technology and Society*.

Week 10: 11.03 & 11.05

Stephenson (1995: 141-280 (approx.), or 2nd third)
Caplan (2008), “Deciphering Nanoethics,” *Chemical and Engineering News*, vol. 86, no. 13.
Berne (2006: Forward, Chapter 2)

Week 11: 11.10 (no class on 11.13)

Stephenson (1995: remainder)
Fiedler & Reynolds (1994), “Legal Problems of Nanotechnology: An Overview,” *Southern California Interdisciplinary Law Journal*.
Bennett (2004), “Does Existing Law Fail to Address Nanotechnoscience?” *IEEE Technology and Society Magazine*.
Sabety (2005), “Nanotechnology Innovation and the Patent Thicket: Which IP Policies Promote Growth?” *Albany Law Journal of Science and Technology*.

Part 4: Nano-Cull

Week 12: 11.17 & 11.19

Crichton (2002: 1-122 (approx.), or 1st third; whichever is longer)
Joy (2000), “Why the Future Doesn’t Need Us,” *Wired*. (wired.com archive)
Milburn (2002), “Nanotechnology in the Age of Posthuman Engineering: Science Fiction as Science,” *Configurations* (10).

Week 13: 11.24 (no class on 11.26)

Crichton (2002: 123-245 (approx.), or 2nd third, whichever is longer)
David Berube (2006: Introduction)

Week 14: 12.01 & 12.03

Crichton (2002: remainder)
21st Century Nanotechnology Research and Development Act.
Ju (2004), “Dangers Compared To Science Fiction,” *The Ithaca Journal*.
Itzkoff (2006), “It’s All Geek to Me,” *New York Times* (March 5).
UNESCO (2006). The Ethics and Politics of Nanotechnology.

Week 15: 12.08 & 12.10

Open discussion, recapitulations, lamentations etc.

e

A non-exhaustive list of questions to keep foregrounded in your mind during the semester should include the following:

What is “nanotechnology”?

How many definitions exist scattered among our assigned readings? What of definitions beyond our readings? Which are most compelling to you and why? (Keep a running tally to share at semester’s end.)

Why should society (whatever that is) be the least bit concerned with nanotechnology? How should society respond to nanotechnological developments, concepts, promises and thought collectives? What role (if any) should various lay elements of society play in responding to such developments? Should nanotechnological development be a purely technocratic affair?

What function(s) does science fiction (sf) —as genre, as irradiating epithet— play in the nanotechnological arena?

Are juridical laws appropriate in domains of technical activities during their larval phase?

How much sway should commercial and economic forces be allowed to exercise over nanotechnological matters?

Who are the mascots of nanotechnology? Whose personas, like scientific service marks, have come to represent, front and shield nanotechnology?

How, if at all, should possible futures and their inhabitants be taken into consideration when thinking through and performing nanotechnology-related activities?

Should a democracy’s research and development differ from those of socialist, communist or fascist regimes?

What other questions should augment this list?

f

And please be aware that “[a]cademic accommodations are available for students with disabilities who are registered with the Office of Disability and Support Services. Students in need of disability accommodations should schedule an appointment with me early in the semester,” or as soon as possible, “to discuss any accommodations for this

course that have been approved by Office of Disability and Support Services, as indicated in your DSS accommodation letter.”