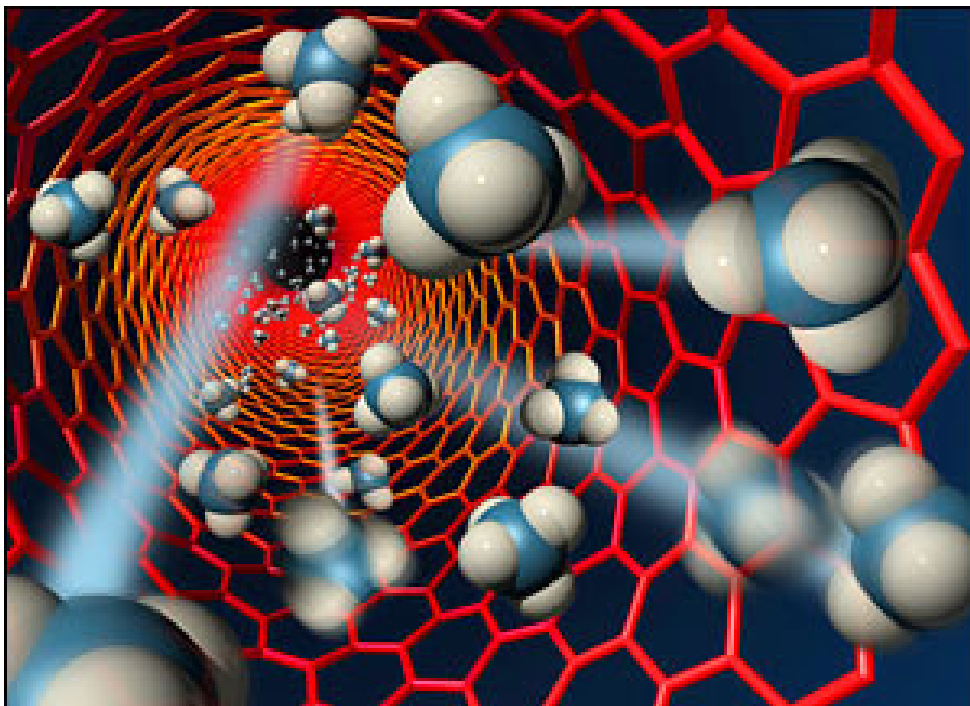


3rd Nano Ethics Workshop

Questions of Justice in Nanotechnological Development(s)

October 31 - November 1, 2008



**Centre for Bioethics and Nanoethics
University of Aarhus, Denmark**



**Nano Ethics Network
2008**

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**Nano Ethics Network
2008**

Program

Thursday October 30, 2008

Arrival

Friday October 31, 2008

Richard Mortensen Room, Students' House

- 9.30 – 9.45: **Registration**
- 9.45 – 10.00: **Opening**
- 10.00 – 11.00: **Nanotechnology and the Emerging Movement for Global Justice**
Andrew Jamison, Aalborg, Denmark
- 11.00 – 11.30: Coffee break (Coffee Room)
- 11.30 - 12.30: **Southern Roles in Global Nanotechnology Innovation**
Donald Maclurcan, Australia
- 12.30 - 14.00: Lunch (Coffee Room)
- 14.00 -15.00: **Workers' Ethical Perspective on Nanotechnology**
Guillermo Foladori, Mexico
- 15.00 - 16.00: **Nanotechnology and Human Implants**
Laura Cabrera, Australia
- 16.00 - 16.30: Coffee break (Richard Mortensen Room)
- 16.30 – 18.00: **General discussion regarding the Nano Ethics Network**
- 18.00: Dinner (Coffee Room)



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Saturday Nov 1, 2008

Richard Mortensen Room, Students' House

- 9.30 - 10.30: **Ethics and the Governance of Nanoscience and Nanotechnology**
 John Weckert, Australia
- 10.30 - 11.00: Coffee break (Coffee Room)
- 11.00 – 12.00: **A Fair Nanocontrol?**
 Arianna Ferrari, Darmstadt, Germany
- 12.00 - 13.30: Lunch (Coffee Room)
- 13.30 – 14.30: **Nanotechnology and Climate Justice**
 Andrew Light, USA
- 14.30 - 15.00: Coffee break (Coffee Room)
- 15.00 - 16.00: **Intergenerative Justice and Responsibility looking at Nanotechnological Applications and Visions**
 Andreas Woyke, Darmstadt, Germany
- 16.00: **Meeting Steering Committee**
- 19.30: Workshop Dinner at Restaurant L'escal down-town Aarhus

Sunday November 2, 2008

Departure



List of Participants

Alfred Nordmann, Technical University of Darmstadt, Germany

Andreas Woyke, Technical University of Darmstadt, Germany

Andrew Jamison, University of Aalborg, Denmark

Andrew Light, George Mason University, USA

Arianna Ferrari, Technical University of Darmstadt, Germany

Arie Rip, Twente University, The Netherlands

Astrid Schwarz, Technical University of Darmstadt, Germany

Donald Maclurcan, University of Technology, Australia

Donald Bruce, United Kingdom

Dorthe Dahl, Copenhagen, Denmark

Fern Wickson, University of Bergen, Norway

Guillermo Foladori, Autonomous University of Zacatecas, Mexico

Heidrun Huber, Vienna School of Governance, Austria

Inger Lassen, University of Aalborg, Denmark

Johann Ach, University of Münster, Germany

John Weckert, Charles Sturt University, Australia

Kees Niekerk, University of Aarhus, Denmark

Kristian Hvidtfelt Nielsen, University of Aarhus, Denmark

Laura Cabrera, Australia

Mette Ebbesen, University of Aarhus, Denmark

Mickey Gjerris, Danish Centre for Bioethics and Risk Assessment, Denmark

Roza Petersen, University of Roskilde, Denmark

Trond Åm, Norway

Ulrik Nissen, University of Aarhus, Denmark

Vanessa Nurock, CEA, France

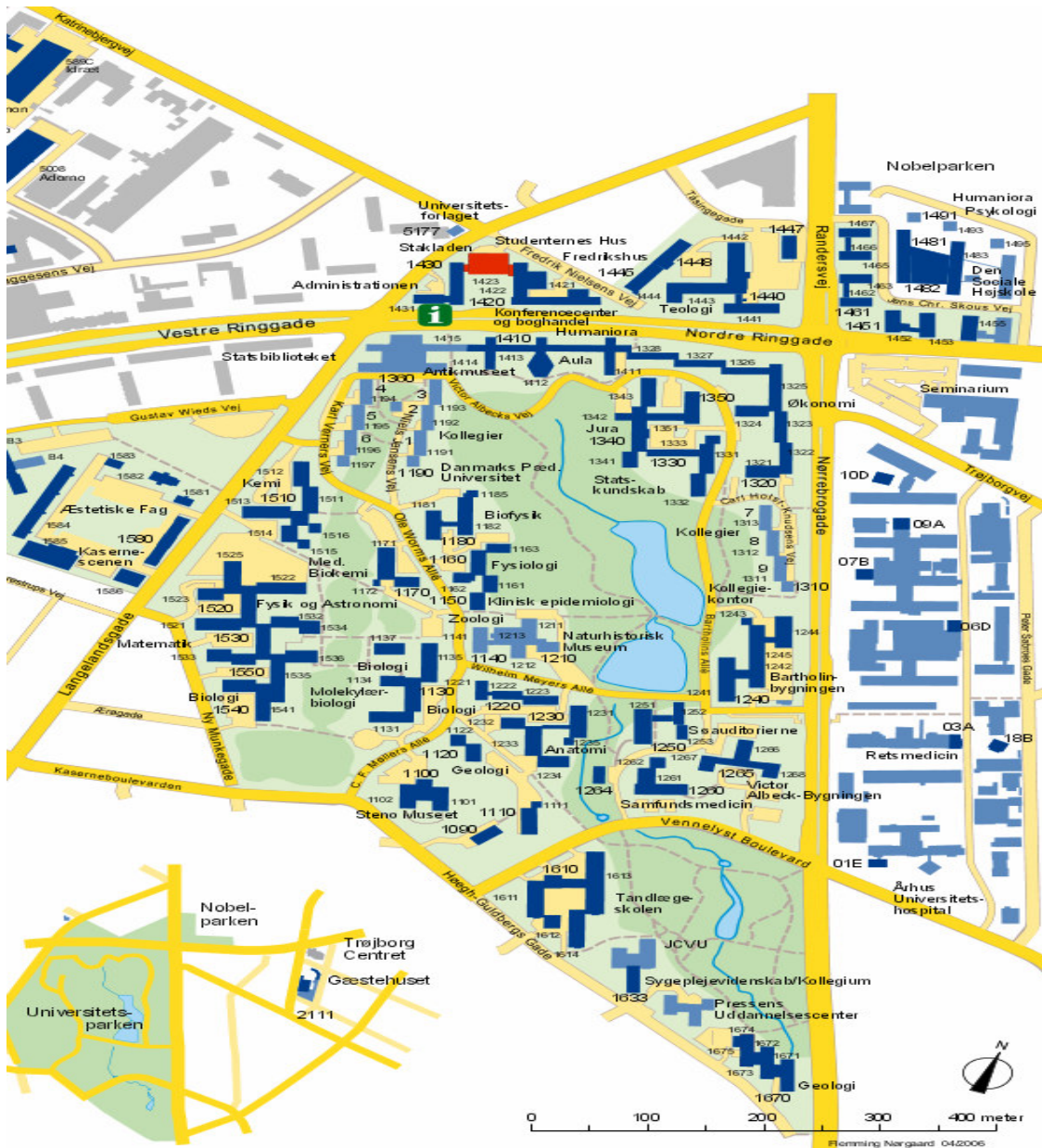


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Locations

Lectures, Lunches, Coffee Breaks and Dinner (Friday night):

Richard Mortensen Room and Coffee Room, University of Aarhus, Frederik Nielsens vej, Build. 1423, DK-8000 Aarhus C, Denmark (please, see Build. 1423 marked with red colour at the card below).



Restaurant L'escal, Aaboulevarden 55 - 8000 Aarhus C: <http://www.lescale.dk>
Saturday 19.30:



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Accommodation

A block of rooms have been reserved for Nanoethics Workshop Participants at the hotel Cabinn in the city centre:

<http://www.cabinn.com/aarhus/aarhus.html?gclid=CNre4sKj0ZUCFQpYQgodlkzyiA>

You must email the hotel directly at aar@cabinn.com and mention that you are booking for the Nano Ethics Workshop, University of Aarhus, Code: 316982 to obtain a room from this block at a cost of: Thursday night – Sunday morning: 1410,- DKK. Rooms are economy class. Breakfast is not included in this price, but costs 50,- DKK. Check inn: 15.00-18.00 and checkout is before 11.00

Please, book your room before September 16.



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Nanotechnology and the Emerging Movement for Global Justice

Andrew Jamison, Department of Technology, Environment and Society, University of Aalborg, Denmark

Abstract

While nanotechnology potentially offers many positive social benefits, serious questions can be raised about whether those benefits will actually be realized. Much depends on which social actors come to be involved in the various processes by which nanotechnology is appropriated, or put to use, in society. At the present time, there is little direct involvement, or even interest, in nanotechnology in the various strands of what is starting to be called a global justice movement. The presentation will attempt to characterize the emerging movement, and identify the attitudes toward nanotechnology that are to be found among its key spokespersons, or what Ron Eyerman and I, in our writings on social movements, have called “movement intellectuals”. Can nanotechnology contribute to furthering global justice or is it rather a source of new varieties of global injustice?



Southern Roles in Global Nanotechnology Innovation

Donald C. Maclurcan, University of Technology, Sydney

Abstract

The term ‘nano-divide’ has become a catch-phrase for describing various kinds of global nanotechnology inequities. However, there has been little in-depth exploration as to what the global nano-divide really means, and limited commentary on its early nature. Furthermore, the literature often presents Southern countries as ‘passive’ agents in global nanotechnology innovation – with an inability to develop endogenous nanotechnology capabilities. Yet others point to nanotechnology providing opportunities for the South to play new roles in the global R&D process.

This paper reports the findings of a qualitative study that involved the perspectives of 32 Thai and Australian experts, from a broad range of fields. The paper first explores how the global nano-divide is understood and the implication of the divide’s constructs in terms of the roles to be played by various countries in global nanotechnology innovation. The paper then explores the potential nature of Southern passivity and barriers and challenges facing Southern endogenous innovation as well as an in-depth consideration of the proposition that Southern countries could be ‘active’ agents in the nanotechnology process.

This paper argues that it is the nano-divide based on nanotechnology research and design capabilities that is fundamental to nanotechnology’s Southern outcomes. The research suggests that Southern countries will encounter many of the traditional barriers to engaging with emerging technology as well as some potentially new barriers relating to the nature of nanotechnology itself. Finally, the research suggests that nanotechnology may offer new opportunities for Southern countries to enter the global research and development picture.



Workers' ethical perspective on Nanotechnology

Noela Invernizzi, Federal University of Parana, Brazil
Guillermo Foladori, Autonomous University of Zacatecas, Mexico

Abstract

A main challenge within the ethical discussion on nanotechnologies is if ethical implications of this technology can be foreseen. Some argue that this is not possible, since most of their products are still in the lab (Keiper, 2007). Others argue that it is possible and should be done, and different approaches are offered (comparing nanotechnologies to previous technologies, real-time technology assessment, visions' evaluation, etc.) (Weckert, 2007; Fiedeler, Grunwald & Coenen, 2005; Moor & Weckert, 2004; Metha, 2002; Guston & Sarewitz, 2002).

These perspectives are important contributions to the debate. Nevertheless, we argue that there are two intertwined issues that deserve more attention. They are: a) Emerging and possible future developments of nanotechnology can be assessed based on historically featured socio-economic trends. These trends allow identifying particular social forces that are *already in action*, nurturing the development of this technological trajectory. This historical perspective is mostly absent in the analysis of ethics of nanotechnology. b) Contradictory interests are crucial to explain the different ethical views at stake. Most ethical analysis list problems (nano divide, military applications, risks, enhancement of human body, surveillance, etc.) as if they were trans-classes or generic. The relation between different group interests and ethical concerns allows understanding ethics in its conflicting development.

A year ago the IUF (*The International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations*) issued a resolution on nanotechnologies (Foladori & Invernizzi, 2007). We researched the reasons and arguments of this resolution and found out that they are based in historical trends and the contradictory interests that exist in their political arena. We use their examples to show the importance of the two issues proposed above to foresee ethical implications of nanotechnology.

References

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Moor, James & Weckert, John (2004). Nanoethics: Assessing the Nanoscale from an Ethical Point of View. In: Baird, D.; Normdamm, A. & Chummer, J. (eds.), *Discovering the Nanoscale*. Amsterdam: IOS Press.

Weckert, John (2007). Editorial. *Nanoethics* 1, 1-2.



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Nanotechnology and human implants

Laura Cabrera, Australia

Abstract

Human implants are among the nanotechnology-based human applications that should be addressed really carefully, since they have the potentiality to help us reaching the stage of cyborgs. This will not only bring the possibility to reach a so called posthumanity, but also a different dimension on the challenges for society, governments and the individual. Human implants can make even blurry the ‘nanoline’ that lies between what we acknowledge as therapy and what we acknowledge as enhancement. The previous will confront governments with new challenges for making decisions on regulations for public health and public funding in nanotechnology. This brings to the fore issues of justice and how to close, instead of widen, the ‘nano-divide’. Given the impact that nanotechnology-based human applications, such as implants, can have for the individual and for the society, a better understanding on the direction and reasons for developing such applications is needed in order to handle them in a wiser and more responsible way.

Keywords : Cyborgs, Distribution, Human implants, Human enhancement, Posthumanity.



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Ethics and the Governance of Nanoscience and Nanotechnology

John Weckert, Centre for Applied Philosophy and Public Ethics, Charles Sturt University, ANU, Canberra, Australia

Abstract

Actual and potential developments in new and converging technologies including nanoscience and technology have led to calls for moratoria and for the precautionary principle to be applied to various aspects of research and development. There have been strong reactions against these calls, reiterating the view that there should be no controls on research and development in the pursuit of new knowledge. Halting research in most cases is too extreme given the potential benefits but allowing completely uncontrolled research and development has its own dangers. A number of issues arise in the governance of emerging technologies that do not with older, existing technologies. With new technologies there is the possibility of directing their development to some extent by regulatory and other means. There are questions of course regarding how effective this can be and whether it is a good idea. Given frequent calls for regulation of the research and development of nanotechnologies, it is worth considering some of the arguments for and against control. Here three aspects of governance will be discussed: regulation, codes of conduct and funding policies. While there is a range of issues that have given rise to concerns, we will focus on the question of justice in the distribution of benefits and harms.

Regulations are typically applied to the uses of technology or to the development of particular products. Cars, for example can only be driven legally within certain parameters and toys with potentially dangerous components are not permitted to be sold. In the case of emerging technologies, however, like nanotechnology, there may be some justification in regulating, or directing in some other ways, before the completed product stage, that is, during the developmental stages of technologies and products, or even at the research stage. Maynard et al, for example, argue for pre-emptive action [1] and Karn and Matthews suggest that “nanotechnology presents a distinct opportunity: we have a chance to deploy it properly” [2], but that this opportunity will not last for long. The European Commission too is focusing on the research rather than on the uses of the technology by developing a code of conduct for nanotechnologies research: “New technologies must be scrutinised with respect to the *prospects* (my emphasis) of contributing to improving human well-being and with respect to possible threats to human well-being” [3]. Finally funding policies, while not usually spoken of as vehicles for controlling research, certainly do, in many countries, play an im-



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portant role in directing the research that is undertaken. An examination of these issues will assist in an understanding of the role of governance in maximising the benefits of nanotechnology in a just manner.

References

- [1] Maynard, A. et al, "Safe handling of nanotechnology," *Nature*, vol 444, 267-269, 2006.
- [2] Karn, B. and Matthews, H.S. "Nano particles without macroproblems," *IEEE Spectrum*, September, 2007.
- [3] European Commission, "Towards a code of conduct for responsible nanosciences and nanotechnologies," Consultation Paper, http://ec.europa.eu/research/consultations/pdf/nano-consultation_en.pdf



A Fair Nanocontrol?

Arianna Ferrari, DEEPEN project, Technical University of Darmstadt, Germany

Abstract

In the paper it will be first argued that the topic of control holds a central role in nanotechnologies, since they are attached with promises of a great transformative potential of matter and of the world at every level. Then it will be investigated how this orientation toward control can influence and transform the realization of the ideal of distributive justice.

Control has always been presented as finality in science, at least since Bacon. However, nanotechnologies seem to promote a new multifaceted concept of control. Here control is both connected with mastery, i.e. with the idea of dominion of things, and with surprise, since nanoscientists want also to create self-regulating or autonomous devices (bottom-up approach) that can present unexpected outcomes. Nanotechnologies are technosciences, clearly oriented toward the realization of tools.

Nano aims at manipulating the atomic level and it offers not only the possibility of reshaping environment and things, but also living beings, including the human being. Since, however, technologies are made up by human beings, if they are oriented toward control, they can easily be viewed as promoting control of some individuals by others. As a matter of fact, control implies an unbalanced, thus unfair, relationship between who/what controls and the controlled.

Control of nature implies the imposition of human goals on natural phenomena and retransforms the idea of sustainability by promoting new technological possibilities for more energy-efficient and ecological devices rather than defending the idea of accepting “the limits of nature”, previously defended by green movements. Analogous, control of living beings becomes transformation and adaptation of them to imposed goals (for example enhancement of animals for a more efficient agriculture) or improvement of human performances for a better self-mastery. Moreover, control promoted by these technologies depends upon the possession of infrastructure and of intellectual property rights that limits the access to technologies (in analogy with the questions connected with the “digital divide”).

Traditionally, the question of distributive justice in technology is connected with the problem of the empowerment of those who own or have access to it against the ones who do not have it and are disadvantaged. Does the fact that nanotechnologies are informed upon the idea of control, and thus



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entail theoretically a reference to an unfair relationship, imply special ethical and political implications for the concept of distributive justice?



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Nanotechnology and Climate Justice

Andrew Light, George Mason University & Center for American Progress, USA

Abstract

Various applications of nanotechnology, both in the works and anticipated, will raise questions concerning distributive justice both at the origin of their development as well as across borders once they are released on the market. The focus of this presentation will be on questions of justice involving the potential for nanotechnologies to help to mitigate (or possibly adapt) to future climate change. Assuming that the most recent estimates of the target for climate stabilization by James Hansen and other leading climate scientists are correct – a reduction of global atmospheric carbon load to 350 ppm – unprecedented changes in energy production will be needed to meet projected global energy demand (15 terra watts as of 2004). After providing a brief assessment of the possible routes to meeting this energy demand without fossil fuels I will make a case from the perspective of global justice for substantial investment in nanotechnology as a core part of meeting that demand. If we are to go this route though then additional questions of justice will follow concerning the necessity of technology transfer from developed to rapidly developing countries to build up an energy infrastructure compatible with this technology. Given current problems with technology transfer regimes which have been negotiated along side the UN Kyoto Protocol process taking this route will put pressure on a thorough reassessment of those regimes.



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Intergenerative Justice and Responsibility looking at Nanotechnological Applications and Visions

Andreas Woyke, Darmstadt, Germany

We are obliged to the next generations in a particular way. The relation between parents and children is paradigmatically for this obligation. An extension of this obligation to the field of technological developments leads to a balanced estimation of possible risks as well as to a critical reflection of all visions of a technological transformation of humanity. Hans Jonas' ethics of responsibility represents an instructive concept of a metaphysically founded ethics, which we can use especially for a critical examination of the questions of justice and sustainability in the context of nanotechnological developments. We need both reflected evaluations of concrete applications and a fundamental criticism of fields of research and application, which endanger the idea of a "whole human being". Concrete problems are the possible toxicity of nanoparticles and the change of natural circulations of materials. In which extent should we confront the next generations with such open problems and unclear risks? Research in the fields of "human enhancement" and "life span extension" is oriented on technological transformations of humanity. Should we see here only possible chances or should we think also about an endangering of a future possibility of a "whole human being"?