



Saarbrücken Manifesto on Nanotechnologie

The "Saarbrücken Manifesto" summarises the scientific results from the conference SIZE MATTERS 2009 and opens it to a broader public. The recommendations address stakeholders in policy, science and economy. The authors will give an impetus to an objective and ethical debate about the future of Nanotechnology.

Saarbrücken, im August 2009

The Saarbrücken Manifesto on Nanotechnology

The authors and initial signatories of this manifesto are scientists from diverse fields of expertise, some from the natural, life and technical sciences, others from the humanities. They have joined forces in their desire to play a part in responsibly shaping the future of nanotechnologies. Essential to this end is the support of an effective flow of information from the scientific world into society as well as the impetus for debate on relevant matters, including ethical issues.

Nano

Nano objects are the smallest functional configurations of matter, which can be used universally as technical building blocks. It has emerged that many essentially well-known substances exhibit new and sometimes unexpected properties in nano format. Furthermore, nanotechnological processes are opening up the opportunity, for the first time in the history of mankind, to position the tiniest of material constituents - right up to individual atoms - with precision; matter can now be changed to meet the aims set by man at a level which had, to a large extent, previously been unattainable for technical processes.

Benefits

All these factors indicate that nanotechnologies have developed the potential to make a substantial contribution to solving top-priority problems. Key fields of application are, for example:

- Increasing the productivity of raw materials by developing new materials and production processes, increasing energy efficiency by using surfaces optimized through nanotechnology, etc.;
- Providing sustainable and safe drinking water by means of intelligent water treatment processes;
- Treating existentially threatening diseases with greater efficiency and fewer adverse side-effects by introducing therapeutically effective substances with targeted accuracy to certain regions of the body.

Risks

Nano objects may also conceal risks. Due to their small size and unusual properties it is important to consider the possibility that they may penetrate more deeply than coarser particles into the body where they may be stored in cells so that, if a large quantity is unintentionally released, this could cause damage to health. Nor can environmental damage be categorically ruled out. Further, it is not possible to ignore the fact that advances made through nanotechnology in the fields of sensor technology and data acquisition can, without appropriate regulation, jeopardize information self-determination (the right to privacy with respect to personal data).

Politics and Research Funding

We appeal to policy makers and institutions promoting research to support research programmes and provide the necessary funding in order to enable a more extensive exploration of such risks. This will allow the opportunities offered by nanotechnologies to be exploited in a responsible manner for the well-being of mankind.

We believe it is a moral obligation to apply new key technologies in such a way as to provide the greatest possible benefits. In essence:

- The welfare of all peoples is to be taken into consideration, not only the welfare of the inhabitants of particular regions of the world.

Therefore, the possibilities offered by nanotechnologies must also, and especially, be used to improve the situation of less developed countries. Applicable technical processes (for example to provide drinking water or protect the environment) should be made available to those countries in need under reasonable conditions, if necessary with generous public subsidies from technologically highly developed countries, to a certain extent offering to share in their well-being. This also involves international agreements on a just regulation of patent claims.

Convenience

With respect to the uses of nanoparticles on an industrial scale, for example in food-stuffs, clothing, cosmetics and such, in the case of which the attainable benefit does not seem to bear a reasonable relationship to the as yet insufficiently explored risks, we recommend that a fair amount of restraint is exercised until careful scientific analysis has shed light on the risk situation. In addition to already existing legal provisions which, from an industrial point of view, regulate production, marketing and liability in respect of a variety of materials and which, therefore, are also or will also be applicable in the field of nanotechnologies, we would welcome - in view of the magnitude and complexity of the scientific subject matter - publicly funded initiatives to fill the gaps in knowledge.

Enhancement

Nano processes will allow an extreme miniaturization of numerous technical systems. This means that technical aids, such as electronic components implanted into the human brain, used to increase physical or cognitive performance may be drawing closer to the bounds of possibility. However, the human brain is composed of an extremely complex system, the workings of which we are only now beginning to understand.

- Invasive procedures on the brain - the material substrate of our personality and of the unity of our consciousness - entail a risk that reflects the complexity of the organ.

In essence, it is morally justifiable to take such a risk in the case of serious neuropsychiatric diseases, which are associated with great suffering for those afflicted by them provided a significant therapeutic benefit can realistically be expected from the relevant procedures. On the other hand, we do not consider such procedures justifiable as a means to artificial enhancement of human performance. In this respect, the distinction between cure and enhancement, however difficult it may be to determine in each individual case, should not become blurred.

Military Technology

On the subject of miniaturization of systems which could be used in military assault operations we strongly urge that these are duly outlawed through international agreements, which will, at the same time, prevent misuse by paramilitary groups.

- On no account is a spiral for a new technology-based arms race to be set in motion, which would prejudice the rewards reaped from the potential of nanotechnologies for peaceful coexistence.

The initial signatories invite all individuals and institutions who wish to support the proposals of this declaration to demonstrate their solidarity by adding their signature to the Saarbrücken Manifesto.

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