

partners

The proponent consortium is coordinated by the Fondazione IDIS – Città della Scienza, based in Naples, Italy. It comprises a total of 11 organisations of excellence in different fields (scientific research, social participation, science communication) representing a wide European dimension. These elements will ensure that high quality standards are maintained in the communication tools and methodologies, while contributing to the widespread diffusion of the project's results.

The participant institutions and their team members include:

-  **Fondazione Idis - Città della Scienza** (Italy)
-  Associazione MQC² (Italy)
-  University of Westminster - Centre for Study on Democracy (United Kingdom)
-  Ecsite - the European Network of Science Centres and Museums (Belgium)
-  Centre de Culture Scientifique, Technique et Industrielle de Grenoble (France)
-  Flanders Technology International Foundation (Belgium)
-  Deutsches Museum (Germany)
-  Universeum AB (Sweden)
-  Ciência Viva - Agência Nacional para a Cultura Científica e Tecnológica (Portugal)
-  Ahhaa Science Centre (Estonia)
-  Fundació Parc Científic de Barcelona (Spain)



Final Conference
Brussels, European Parliament,
5th of February, 2007

nanotechnologies
and **nanosciences:**
a discussion on
ethical, legal
and **social** aspects

promoted by the
DG Research European Commission
and organised by the **NanoDialogue Consortium**

nanodialogue



index

The Nanodialogue project: an integrated approach to communication	p. 3
Nanodialogue: the exhibition module	5
Nanodialogue:the coverage press	8
Citizens feedback assessment	10
Nanodialogue:final conference	13
Acknowledgements	15
Partners	16

the nanodialogue project: an integrated approach to communication

Engaging citizens in dialogue and discussions about emerging science and technologies has been recognized by the European

Commission as a fundamental component to create the knowledge economy at the basis of the European Union's Lisbon Agenda. Science centres and museums are the natural choice of venue to begin such activities, since they offer an opportunity for a wider exchange of ideas, providing information that is generally perceived to be reliable and giving different actors a chance to meet and voice their concerns. In the field of nanotechnology, dialogue on the risks and ethical issues is particularly relevant. In fact, while some nanotech products are already on the market, public awareness of the real economic and social potential of this technology is still low.

In this framework, Fondazione IDIS - Città della Scienza has coordinated the NanoDialogue project (Enhancing dialogue on Nanotechnologies and Nanosciences in society at European level - www.nanodialogue.org), with funding provided by the European Commission, under the Nanotechnologies and Nanoscience program.

The "pillars" of Nanodialogue are a modular exhibition, designed for display in 8 different countries (Belgium, Estonia, France, Germany, Italy, Portugal, Spain, Sweden), a program of events and participatory activities in each location, and a survey of public perceptions and expectations

with 800 questionnaires and a multimedia polling station at each location.

The analysis of these components has led to a final conference, held in the seat of the European Parliament in Brussels, in order to present the results of the project to the European Commission and Parliament.



The first step in the project was the establishment of a Scientific Advisory Board, composed of nanoscientists, as well as social scientists, philosophers and experts in communication; in total 26 members from 11 European Countries. The second step was to have the Scientific Advisory Board and the Steering Committee (with representatives from all the partners) working together in a participatory procedure, namely a scenario workshop, in order to generate guidelines, directions and specific subjects to be included in the exhibition. Two main proposals emerged from the scenario workshop, both representing a "common ground" for all the partners. These two visions were discussed and eventually the Steering Committee agreed on the final design inspired by one of the two proposals.

Key issues that contributed to the choice were the possibility to have, even in a limited space (the exhibition is about 60 sqm), ample room for live programmes and demonstrations, display of real objects and tools, and the flexibility to customise the exhibition with local input from research and industry.

In each Country, the exhibition became a catalyst for further activities, thus encouraging visitors to view the museum not as a display of information, but as an active crossroad of social actors.

an integrated approach to communication

nanodialogue: the exhibition module

A "Preliminary program of the exhibition" was developed and presented to the partners and to the Commission on November 2005

in Brussels, following the results of the Scenario Workshop - held in Naples in July 2005. The enhancement of the project during the following steps, both from the architectural and the graphical points of view, was developed in line with that presentation and implemented by the analysis and conversation that followed between participants to the meeting.

■ The "Overall Approach"

The main goal of the project was to arise curiosity and stimulate debate on nanotechnologies and nanosciences, both for the general public and for more sophisticated targets. So, the exhibition should be exciting enough to achieve curiosity for science and research in general, and specifically for nanosciences and nanotechnologies. The debate approach - and the Ethical, Legal and Social Aspects (ELSA) involved - suggested to organise the exhibition module as an ancient "agorà", a public area to meet, discuss and concentrate, an area where visitors could compare their ideas, opinions and points of view.

■ Different Levels of Messages

The exhibition communicates to visitors at different levels, in order to arise the largest interest. There were 3 levels of messages: the first concerned the three great walls, and it included the appropriate artistic and graphic background with images related to the topic, the titles of the sections and the "Eight questions" on nanotechnology, a double interview with answers from scientists with two different backgrounds. The second level concerned the "Information" panels, with scientific information on the different topics and the "ELSA" panels, where opinions of scientists, researchers, philosophers and other people with different background were given. The third level concerns the "in-depth" panels: more detailed material presented locally in "books", labels, files, etc.

■ General “Structure”

The contents of the exhibition module were organized in 7 sections; Sections 1, 3 and 4 were defined by freestanding “scenery walls” with graphics, background and explanatory text. Each wall has a characteristic colour uniting the scenery and the exhibits.

The rear parts of the walls contained information too: the “agorà” is an open place, which wants to arise curiosity, also from the outside, and to welcoming everybody. In every section, together with the main information, there were comments and opinions on the same topic, so visitors could confront their ideas and opinion with those expressed by scientists, politicians, philosophers and science fiction writers.

The central table, representing a space for debate and discussion, gave people the opportunity to “play” with real nano-objects; at the same time the space was also used for science demos, focus groups and small debates. During the display of the exhibition, in all 8 Countries, different events were performed, in order to enrich the exhibition module, but also to give visitors the opportunity to be involved more actively into the debate.

Section 1 Facts or Fantasy?

Here the aim was to illustrate how much science fiction influenced our perception of new technologies. Scenarios coming from social and psychological studies and from science fiction were illustrated and analysed. At the same time some information on the advance of the nano research were given, together with samples of nano structures already present in nature.

Section 2 Historical narrative

A self-standing bookstand showed the main steps of research and applications towards the new outcomes in the field of nanosciences and nanotechnologies. Semi-circular pages, which could be turned by visitors, also allowed to implement the History section with new information as required.



Section 3 Into the nano-world

Here visitors could learn more about the technologies and the dimensions of the nanoworld. Models of nanoparticles together with real applications and exhibits were shown.

Section 4 Who controls?

Here ethical, legal and social aspects of the research were given in form of comments of scientists, philosophers and experts.

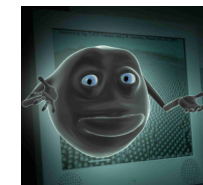


Section 5 Applications

A big structure with boxes showed samples of real nano applications (most of them already on the market). They were displayed but also used for events and demonstrations. At the same time panels gave information on future developments of nanotechnologies and on the places, in each Country, where nano researches are currently carried out

Section 6 Video

The video contains the whole content storyboard of the exhibition, plus some extra contributions (animation, movies). It went on in a loop, but eventually could be stopped by a guide/explainer to deepen certain topics. “Atomos”, the story teller, guided visitors through the different topics.



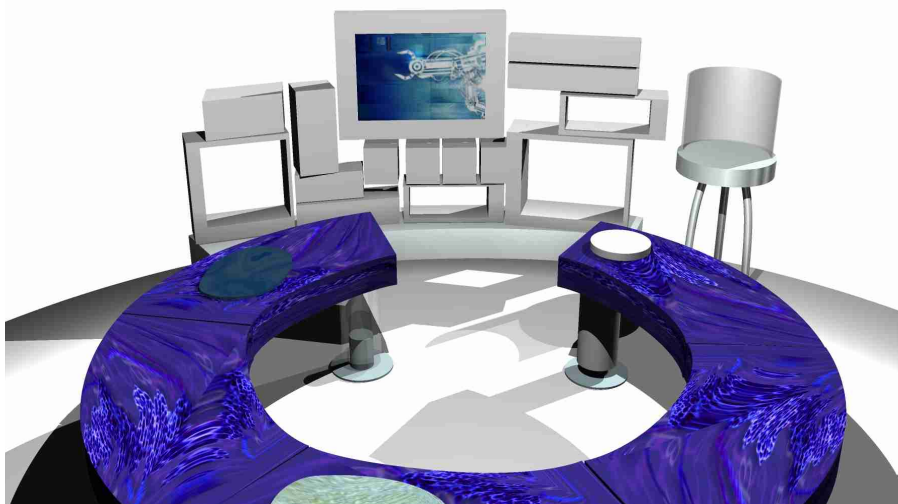
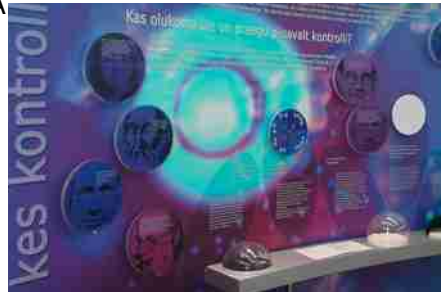
Section 7 Feed-back multimedia

The final section of the exhibition focused on people’s perceptions and points of view. Visitors can record their comments and read these ones left by others, as well as to access additional, in-depth information. Furthermore, the multimedia is linked to the project website. Three options are available for visitors who can choose between: watching the video or specific parts of it, going on the Nanodialogue web site and on the connected sites, leaving comments.

citizens feedback assessment

The Citizens' Feedback Assessment explored visitors' perceptions and expectations on nanotechnologies and nanosciences (N&N). The questions and the resulting

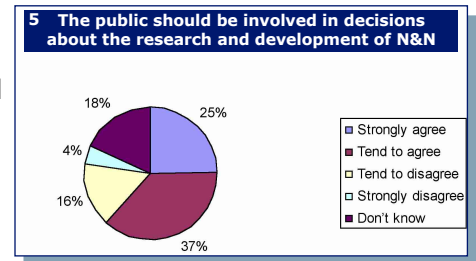
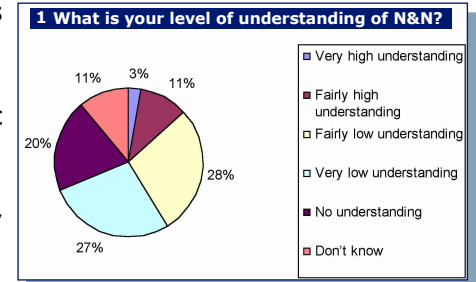
data analysis was produced by the University of Westminster, to elaborate a list of recommendation and suggestion for the "governance" agenda in the ERA. From March to October 2006, 706 visitors to the exhibitions held in the eight participating countries were invited at random to complete a brief questionnaire to determine: (i) their socio-demographic profile, (ii) their perceptions and expectations regarding N&N, and (iii) their assessment of the potential benefits and risks posed by N&N, based on the content of the exhibition. Sections (i) and (ii) were completed by the visitors before viewing the exhibition while section (iii) was completed following the exhibition. Some of the respondents to the questionnaires were also involved in a series of 16 focus groups across Europe for a brief discussion to further explore their views with the aid of professional moderators.



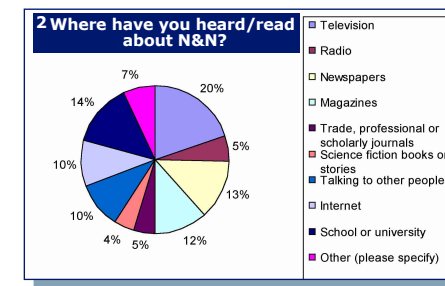
Questionnaire responses

The socio-demographic categories correspond with those used by Eurobarometer to enable comparative analysis where possible.

A gender balance of respondents was achieved, young people under the age of 24 were the largest single socio-demographic group to visit the exhibitions (45%), 47 percent of respondents indicated that they were still studying. The exhibitions appeared to attract visitors with a high-level of educational attainment as 35 percent of respondents indicated that they had completed their education above the age of 20.



Prior to visiting the exhibition, the majority of respondents rated their level of understanding of N&N as low (55%) compared to just 14 percent who thought their level of understanding was high. A significant proportion (20%) of visitors stated that they had no



understanding at all. Responses to the question where have you heard/read about N&N? varied considerably with 20 percent of respondents indicating their primary source as television followed by school or university (14%), newspapers (13%), and magazines (12%). Surprisingly,

the internet (10%) and talking to other people (10%) did not feature as major sources of information about N&N, perhaps indicating a lack of sufficient interest in the topic to actively seek out further information. Even fewer respondents had heard or read about N&N from the radio (5%), from trade, professional or scholarly journals (5%) or from science-fiction books or stories (4%). Where respondents

stated that they have heard or read about N&N from 'other' sources (7%), this included mainly the museums, science centres and public spaces in which the exhibitions were held, however many also indicated that they had never heard of N&N.

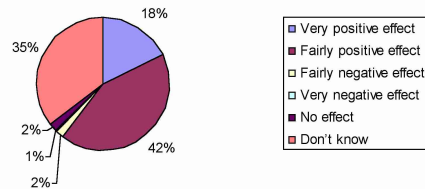
nanodialogue: final conference

European Parliament, Brussels
February 5th, 2007



A discussion on ethical, legal and social aspects of nanotechnologies and nanosciences

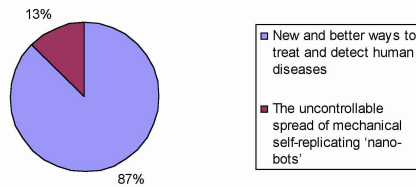
3 What effect do you think N&N will have on your way of life in the next 20 years?



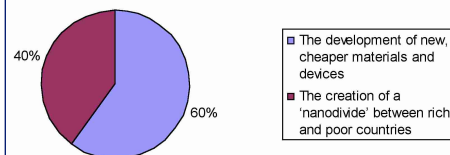
When asked what effect do you think N&N will have on your way of life in the next 20 years, 60 percent of respondents believed the effect would be positive while only three percent envisaged negative effects.

Of the nine risk/benefit scenarios proposed, respondents perceived more benefits than risks posed by N&N. Benefits to human health and environment were the most keenly anticipated while risks to national security and the economy posed the most concerns.

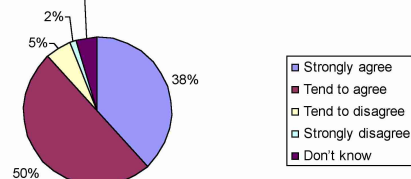
8 In my opinion, N&N is more likely to lead to:



8 In my opinion, N&N is more likely to lead to:



9 The exhibition has increased my understanding of N&N



Finally, 88 percent of respondents agreed that the NanoDialogue exhibition had increased their understanding of N&N.

The final conference marks the conclusion of the "NanoDialogue" project, the first at the European level focused on an intense dialogue activity with citizens and stakeholders centered around an interactive exhibition module on nanosciences and nanotechnologies displayed across Europe. The interdisciplinary characterization of the project – which has seen the involvement of experts from different backgrounds, such as nanosciences, social sciences and philosophy, is mirrored in the choice of speakers. The morning is devoted to presenting the activities in the project and the related social, ethical and political aspects, from various points of view. In particular, the first session concerns the activities accompanying the exhibition and the results of the survey conducted on a sample of visitors to the exhibition concerning their knowledge of, and attitude towards, nanotechnology and its products. The conference represents the timely commitment of the European Commission to encourage debate on cutting edge science, in a phase in which the impact of science – and particularly nanosciences - on society is becoming stronger, thus provoking widely diffused doubts and uncertainties, although it is still vitually unknown.

9.00 - 9.30 REGISTRATION

9.30 - 11.00 FIRST SESSION - The Nanodialogue project: contents, activities, results

chair

Catherine Franche, Executive Director, ECSITE

speakers

Luigi Amodio, Director of Fondazione IDIS-Città della Scienza, Naples, Italy

Andrea Bandelli, Vrije Universiteit, Amsterdam, The Netherlands

Alison Mohr, CSD, University of Westminster, London, UK

11.00 - 11.30 Coffee break

11.30 - 13.30 SECOND SESSION - Nanotechnologies and their implications in Society

chair

Umberto Guidoni, Member of the European Parliament

speakers

Bengt Kasemo, Professor of Physics, Göteborg University, Sweden

Alfred Nordmann, Professor of Philosophy, University of Darmstadt, Germany

Massimiano Bucchi, Professor of Sociology of Science, University of Trento, Italy

Wolfgang Heckl, Director of the Deutsches Museum, Munich, Germany

13.00 - 13.30 KEYNOTE SPEECH

Philippe Busquin, Member of the European Parliament, Chairman of STOA (Scientific Technical Options Assessment)

13.30 - 15.00 Lunch break

15.00 - 17.00 THIRD SESSION - Round table on Nanotechnologies today and tomorrow: current research and possible future concerns

chair

Renzo Tomellini, Head of Unit, Nano and Converging Science and Technologies,

European Commission

speakers

Maria Jesus Buxo i Rey, Professor of Social and Cultural Anthropology, University of

Barcelona, Observatory Bioethics and Law, Barcelona Science Park, Spain

Dominique Grand, MINATEC, Commissariat à l'Energie Atomique, France

Wolfgang Heckl, Director of the Deutsches Museum, Munich, Germany

Simon Joss, CSD, University of Westminster, London, UK

Doug Parr, Chief Scientist, Greenpeace UK

Vinod Subramaniam, Professor of Biophysical Engineering, University of Twente, The

Netherlands

17.00 - 17.30 CONCLUSIONS

Peteris Zilgalvis, Head of Unit, Governance and Ethics, European Commission

Nicholas Hartley, Director of Directorate G Industrial Technologies, European Commission

Acknowledgements

Acknowledgements

The Fondazione IDIS – Città della Scienza and the Nanodialogue Consortium wish to express their gratitude to the members of the Scientific Advisory Board and the speakers in the final conference for their scientific guidance in key moments (scenario workshop and final conference) and throughout the project and for their generous contribution in the realisation of the project's objectives.

Many thanks to the Nano-X company for their kind gift of materials and artifacts produced with the use of nanotechnology to be displayed in the Nanodialogue exhibition.

A grateful acknowledgement to the officers of the European Commission, Nanotechnology Unit, especially to Angela Hullmann, whose efforts were instrumental in insuring a smooth running of the project from beginning to end. A warm thanks goes to the Member of European Parliament Umberto Guidoni for the organisation of the final conference and to his staff, in particular to Marco Furfaro.

For her efforts towards publicising the final conference and the Nanodialogue project, many thanks to Anne Caudron.

