

**NANOTECHNOLOGY:
GETTING THE PUBLIC INVOLVED IN DECISION-MAKING**

**A Community Workshop Sponsored by the Loka Institute
Hosted by Howard University
Washington, DC
September 10-11, 2004**

Final Report and Recommendations

The Community Workshop on Nanotechnology focused on the public participation provisions of the 21st Century Nanotechnology Research and Development Act passed by Congress in 2003. That new law authorizes up to \$3.7 billion in the next few years in federal spending for this rapidly emerging field. Nanotechnology is widely expected to generate economic, environmental, and social changes and ethical dilemmas on a par with those stemming from digital technology and genetic engineering. The new law also requires **“public input and outreach to be integrated into the Program by the convening of regular and ongoing public discussions, through mechanisms such as citizens' panels, consensus conferences, and educational events.”**

The Loka Institute invited a distinguished group of grassroots activists to participate in the workshop, and to serve as Loka's Community Advisory Group on Federal Nanotechnology Policy. The community advisers discussed major social, environmental, and ethical issues related to nanotechnology. The group also considered ways in which everyday citizens could become aware of and engaged in policy formulation and implementation as soon as possible, given how rapidly nanotechnology research, development, and commercialization are advancing. To facilitate this conversation, top experts on current nanotech research and development efforts from academe, business, and government made brief presentations at the workshop and participated in extended conversations with the Community Advisory Group. Brief biographies on all the participants are appended to this report, along with the program itinerary.

After discussing the issues and policy options, Loka's Community Advisory Group developed 13 specific recommendations that aim to promote awareness of and participation in this emerging technological arena by as broad a base of citizens as possible. The recommendations receiving the strongest endorsement from the group were:

1. Establish a program as quickly as possible with an adequate annual budget to fund, on a regular and frequent schedule, both an ongoing series of national citizen panels and an ongoing series of local citizen panels and other community forums on nanotechnology issues. At both the local and national level, such citizen panels and other community forums should be designed to allow participants to inform themselves about nanotechnology issues, to take part in in-

depth and face-to-face discussions and deliberations with other members of their communities on the particular issues related to nanotechnology that they themselves identify as their top interests and concerns, and to communicate their conclusions and concerns to the media, the general public, and local, state, and federal officials.

It is especially important to note that citizen panels (or consensus conferences, as they are also known) offer the best opportunity among currently available methods of citizen engagement for the sustained inquiry and deliberation that is essential for meaningful public participation in complex issues. Their success has been demonstrated by over 40 panels in Europe and more than a dozen in the North America and the Pacific Rim. Without a coordinated program that includes meaningful deliberative opportunities for everyday citizens – in other words, real opportunities for the public to experience that its input is actually taken seriously and integrated into policymaking – one-way federal efforts at public outreach on nanotechnology cannot seriously engage the citizenry. In fact, any plan limited to one-way public outreach, from the government to the public, is likely to lead to public cynicism and disillusionment with nanotechnology and costly mistakes in public policies.

2. The program recommended above should also provide access to unbiased information about nanotechnology and its potential positive and negative impacts to all participants in such forums as well as to the general public. (The government should avoid even the appearance of trying to sell nanotechnology to the public.) As much information as possible about all unclassified research and development activities supported by the federal government should be publicly available. The program should also make it a high priority to respond to requests for information from individual citizens, from community-based organizations and other non-governmental organizations, and from the media.
3. Provide the public opportunities to influence policies and decisions of the National Nanotechnology Coordinating Office through public input before such decisions are implemented. Within the boundaries of its authorization, the NNCO should consider adapting and integrating Rep. Eddie Bernice Johnson's proposed amendment to HR 766 that required NNCO to organize a citizen panel at least once every 18 months, and provided specific funding for them. The NNCO should commit itself to responding formally and publicly to the recommendations of any citizen panel and other forums for public participation.
4. Earmark a portion of the nanotechnology funds at each participating federal agency (at least 3%) for community-action research projects that link nanotechnology research and development to community needs and community concerns. These funds can be allocated on a competitive basis, with an emphasis on both an equitable geographic distribution and broad coverage of the full range of grassroots concerns related to nanotechnology, including the potential positive and negative impacts on ethnic and income groups that have traditionally been

most disenfranchised, and on the workforce. This will establish a direct and ongoing connection between citizens' and communities' concerns about specific social, economic, health, environmental, and ethical issues related to nanotechnology and the federal government's overall program of research and development. Such a connection is essential in assuring that nanotechnology policies serve the public interest, but it is currently missing from federal nanotechnology R&D programs.

5. NNCO should assure that *all* social-ethical aspects of nanotechnology are addressed, including the very challenging issues involved in molecular manufacturing that have to date received relatively little attention. Nanotechnology is developing toward an ability to build nanoscale templating and manufacturing equipment that will likely enable a sharp increase in product complexity and performance, along with a steep decrease in cost. NNCO should proactively address the social, ethical, and political issues raised by these developments, taking full account of the possible disruptive changes in areas as diverse as manufacturing, military hardware, and medicine. This will require study of the various ways in which nanosystems can construct nanoproducts, the range of performance of these systems, and projection of their impacts in a variety of areas.

Additional observations by and recommendations for the federal government from the Community Advisory Group include:

1. Conduct an assessment of expected benefits and potential hazards of nanotechnology and the likely distribution of these benefits and hazards across diverse socioeconomic categories (e.g., class, ethnicity, geography, age, disability, etc.)
2. Develop detailed suggestions for participatory practices in the NSF's Broader Impacts Criteria (Criteria 2) for use in the review of nanotech research centers proposals. Representatives of grassroots, community-based groups and representatives of labor, environmental, and other public-interest groups should be included on the panels of reviewers for the center proposals.
3. Develop tools to measure and describe nanotechnology objects.
4. Fund comprehensive risk assessments of nanotechnology, integrating such issues as consumer product safety, pharmaceuticals, environment, health, civil liberties, workforce impacts, and other ethical issues.
5. Make full use as soon as possible of deliberative citizen panels and their recommendations to democratize the approval process for nanotechnology programs and projects, to increase public awareness of nanotechnology, and to avoid expending large amounts of public and private money to develop products

and services that may turn out to be at odds with the public's priorities and expectations of new technologies.

6. Create and distribute to interested citizen groups a genealogy of agencies and high-profile individuals involved in nanotechnology policy. Questions to be addressed would include: When was the agency born? Who conceived it and why? Who have been and are the important social actors? What was and is the ambient social /political climate? In addition to brief biographies and intellectual histories, accounts of high profile individuals could situate them in this nexus of institutions.
7. In addition to the current representation of business and universities, routinely include multiple representatives from the general public and grassroots community-based groups, from labor, and from environmental and other public-interest organizations on federal public advisory panels, such as the President's Council of Advisors on Science and Technology and federal agencies such as the Environmental Protection Agency, the National Science Foundation, the National Institutes of Health, the Department of Commerce, and the Occupational Safety and Health Administration. Recruit members of the general public for federal advisory panels from the pool of citizens who have participated in citizen panels.
8. Fund community learning on nanotechnology issues by working in partnership with existing community organizations such as community colleges, libraries, and nonprofit groups to provide resources for outreach and education. Such partnerships could disseminate substantial, relevant, and accessible information to the public, using popular education methods where appropriate to reach diverse populations.

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AGENDA

Friday, September 10, 7-9 p.m. Reception, Howard University, Blackburn Center, Rooms 148-150

Saturday, September 11, 9 a.m. – 4:30 p.m., Howard University, Forum Room

9- 9:30 a.m. – Introductions and Overview

9:30 – 10:30 a.m. – Social and Ethical Issues in Nanotechnology

Brief Presentations and Discussion with Community Advisory Group

Presenters:

Taft Broome, Howard University, Department of Engineering
Kristen Kulinowski, Rice University Center for Biological & Environmental Nanotechnology
Chris Phoenix, Center for Responsible Nanotechnology
Hope Shand, ETC Group
Sean Murdock, NanoBusiness Alliance

10:30 – 10:45 a.m. – break

10:45 – noon – Continue Advisory Group Discussion with Presenters

Noon – 1:00 p.m. – Lunch

1:00 – 2:30 p.m. – Policy Options for Citizen Participation

Brief Presentations and Discussion with Advisory Group

Presenters:

Michael Bennett, Rensselaer Polytechnic Institute
David Guston, Rutgers University, Center for Responsible Innovation
Dick Sclove, founder, Loka Institute
Eric Werwa, Office of Congressman Mike Honda of California

2:30 – 2:45 p.m. – Break

2:45 - 3:15 – Input from Observers

3:15 – 4:30 p.m. – Advisory Group Deliberation and Recommendations

Participants

(* indicates member of Loka Institute Community Advisory Group on Federal Nanotechnology Research and Development Policy)

Michael Bennett is a graduate of Harvard Law School and is completing his doctorate in Science and Technology Studies at Rensselaer Polytechnic Institute, focusing on issues and policies in nanotechnology.

Taft H. Broome, Jr., is a professor of civil engineering at Howard University. His research interests include the study of continuous and dynamical systems. He has served in leadership positions in major national organizations including the American Association for the Advancement of Science, the American Society for Engineering Education, and the National Association for Science, Technology, and Society. Taft served on the Committee on Technological Literacy for the National Academy of Engineering, which authored the 2002 report, *Technically Speaking: Why All Americans Need to Know More About Technology*.

***Jennifer Caron** has been an intern and volunteer at L.E.A.D. Agency, Inc., in northeastern Oklahoma. Adults in the community were inspired to create L.E.A.D. Agency (Local Environmental Action Demanded) by students in the Miami High School Cherokee Volunteer Society, who were concerned about pollution from the Tar Creek Superfund site and other local problems. Jenn studied science and ethics at Caltech and is currently in a graduate nursing program at Johns Hopkins, with plans to return to Oklahoma to work in public health.

***Deanna Cooke** is the assistant director of research for the Center for Social Justice Research, Teaching, and Service at Georgetown University. She is also co-director of the Community Research and Learning Network. Deanna coordinates community-based research projects between Georgetown and community organizations in the D.C. area.

***Shella Fon** is the D.C. director of Project South: Institute for the Elimination of Poverty & Genocide, a broad-based, community-driven membership organization that develops and conducts popular political and economic education and action research for organizing and liberation. Project South develops indigenous popular educators and movement leaders from grassroots and scholar-activist backgrounds, bringing them together on the basis of equality to engage in building a bottom-up movement for social and economic justice.

***Eric Davila**, a student in the environmental engineering doctoral program at Texas A&M University Kingsville, is working with the Llano Grande Center for Research and Development to help the Rio Grande Valley comply with sustainable development as the region experiences growing pains, while aspiring to boost the scientific and technical infrastructure of South Texas through community-based educational ventures.

David Guston is director of the new Center for Responsible Innovation and associate professor of public policy in the Bloustein School of Planning and Public Policy, both at Rutgers, the State University of New Jersey. He has written extensively on science and technology policy, including citizen participation, and has worked at the US Congressional Office of Technology Assessment and the National Academy of Sciences.

***Judyann Hansen** is a resident of Northeast Washington, D.C., and is interested in working in the technology field. She is trained to repair computers and is Microsoft MCSE certified. Judy participated in the Family Food and the Neighborhood Program of Community Harvest to develop her entrepreneurial skills around healthy food. Community Harvest is a nonprofit organization with a mission to create a locally rooted and sustainable food system that meets the needs of both underserved communities and small farmers in the Washington, DC region. The organization was started on the belief that ALL people should have access to fresh, healthy food regardless of their income or socio-economic status.

***Debony Heart** is programs/volunteer coordinator at Byte Back, a Washington, DC organization that provides computer access and computer training to underemployed and unemployed adults, and computer literacy to at-risk youth.

***Kai Kinlow** is 16 years old and a junior at School Without Walls. She lives in the Bellview community in Southeast Washington, D.C. Kai serves on the D.C. Youth Advisory Council and participated in the Mayor's Youth Leadership Institute. She plans to be an attorney and/or a congressperson. Her father, Eugene Kinlow, serves on the advisory board of Community Harvest.

Kristen Kulinowski is the executive director of the Center for Biological and Environmental Nanotechnology at Rice University. She has presented on Nanotechnology at American Chemical Society and National Science Foundation conferences, and is the recipient of a Congressional Science Fellowship.

***Clark McKnight** is the community director for the D.C. office of Project South: Institute for the Elimination of Poverty & Genocide. As a community organizer, he helped organize the Trinity Towers Tenants Association, which negotiated a contract to secure the right of low-income and former section 8 residents to remain for 40 years. Trinity Towers is in the Columbia Heights neighborhood of northwest D.C.

Sean Murdock is executive director of the The NanoBusiness Alliance, the world's leading nanotechnology trade association. Sean Murdock joined the Alliance having built the leading regional nanotechnology initiative in AtomWorks, and having spent several years at McKinsey initiating the firm's nanotechnology efforts. Sean has been very active in nanotechnology trade and economic development issues. He helped to organize and execute the first Nanotechnology Trade Mission to Europe in conjunction with the NanoBusiness Alliance and the U.S. Department of Commerce.

Chris Phoenix is the co-founder of the Center for Responsible Nanotechnology. He has attended numerous nanotech conferences, contributes frequently to several on-line discussion lists, and has published a book and a Ph.D. thesis on nanotechnology. He is a senior associate of the Foresight Institute and co-moderator of the sci.nanotech newsgroup.

***Esther Portillo** is the eldest daughter of Salvadoran migrants, born in the Pico Union neighborhood of Los Angeles. After college at Cal Poly Pomona, where she studied with film-maker Saul Landau, Esther joined the Coalition for Economic Survival and began working closely with the Inner City Law Center, advocates who understood the need not only to represent vulnerable tenants in court but also to give them the tools to change housing policy. A year ago, Esther left Los Angeles for the *barrios* of San Bernardino, where she went to work at Libreria del Pueblo, a legal clinic that organizes and represents tenants.

***Timothy Sandoval** is a College counselor with Bright Prospect – a scholarship and mentorship program in California’s Inland Valley that helps high achieving high school students from low income families get into top private liberal arts colleges. Tim was previously a high school English teacher, and is a mainstay in the Inland Empire Networking Society, a study/action group.

Richard Sclove is the founder of the Loka Institute and the author of the award-winning book, *Democracy and Technology*.

Hope Shand is Research Director for the Action Group on Erosion, Technology and Concentration (ETC Group). She has written extensively on the topic of agricultural biodiversity, and on the social and economic impacts of new biotechnologies. Among her many publications are *Human Nature: Agricultural Biodiversity and Farm-Based Food Security* (1998) and *The Ownership of Life: When Patents and Values Clash* (1997).

***Darshell Silva** was until recently a case manager at the HELP Lead Safety Center, working with families of children with lead poisoning. She has worked as a children’s specialist with the library system in Rhode Island, been a community organizer with the Rhode Island Community Food Bank, and has done three years of AmeriCorps (2 as an educational advocate and 1 year fellowship with America’s Promise). She is now pursuing graduate studies at the University of Rhode Island and works there with the Feinstein Center for Service Learning.

***Greg Tanaka** teaches human development at Pacific Oaks College in Pasadena, California, where he is a clerk at the Center for Democracy and Social Change. A former teacher in the U.S. Teacher Corps in Deming, New Mexico, he has worked in numerous fields, recently heading an initiative to create an intercultural campus climate at a Los Angeles area university.

Eric Werwa is an aide in the Office of Congressman Mike Honda of California, who is a member of the House Science Committee. The issues Eric is responsible for include

science and technology, energy, the environment, and agriculture. He helped draft legislation last year to provide for public input to federal nanotechnology policy.

***Lea Zeldin** is the editor of Health Writers, Inc., an education and information not-for-profit media group advocating for change within the health care system. She is the food and popular culture critic for Madison, Wisconsin, Community Radio Station WORT-FM. Zeldin has served as a citizen/consumer member on many state and local government panels and commissions including the Madison Board of Health and the Wisconsin Hospital Rate Review Commission.

Support staff for the day:

Our facilitator, **Tod Sloan**, is professor and chair of the Department of Counseling Psychology in the Graduate School of Education at Lewis and Clark College. Tod is an active member and also serves as staff for Psychologists for Social Responsibility.

Loka board co-chair **Rick Worthington** and Loka board trustees **Shirley Jones, Tosha Link, and Colleen Cordes**.

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