

## **Advancing Beneficial NanoTechnology Focusing on the Cutting Edge**

*-Summary of 13<sup>th</sup> Foresight Conference on Advanced Nanotechnology Held on Oct. 22-27<sup>th</sup> 2005, San Francisco-*

Foresight Nanotech Institute has held 13 annual conferences in the last one and half decades. I had not been able to attend the previous ones until the last one. 13<sup>th</sup> Foresight Conference on Advanced Nanotechnology held during Oct 22-27<sup>th</sup> 2005 at the San Francisco Airport Marriott. I felt of proud of myself for having chosen the best conference of the year worldwide and the first Foresight conference that not only covered the traditional cutting edge and challenging research themes, but also addressing new policy topics and exciting business opportunities.

The event had a very good turned out, over 300 registered participants with 40% from industries and business sectors and the rest from government and research institutions as well as the press.

The foresight conference attracted substantial non American speakers and participants this year from Canada, France, Germany, Ireland, Israel, Italy, Japan, Korea, Malaysia, the Netherlands, South Africa, Sweden, and UK.

The conference was generously sponsored by (alphabetical order) Battelle, Biophan Technologies, Dorsey, Draper Fisher Jurveston, Nanorex, Nanoscience Technologies, Naturalnano, Sun Microsystems, The Waitt Family Foundation, Zyvex Corporation and others.

The novel feature in this foresight conference program is the Application and Policy section chaired by Mr James Von Ehr (CEO of Zyvex) and carried out through Oct. 24-25<sup>th</sup> 2005. The organizers and chairmen have cleared recognized the close relationship between policy and application of nanotechnology, and invited high level speakers from government and industry to address the Foresight Nanotech Challenges 1) Meeting Global Energy Needs with Clean Solutions -Nanotech For Clean Energy (Electric Power Research Institute, Lockheed Martin, Nexenergy, HelioVoit, Alameda Capital), 2) Providing Abundant Clean Water Globally Panel - Nanotech for Clean Water (eMembrane, KX Industries, Argonide, Quantum Insight), 3) Dendrimer Technology: A Nanoscale Delivery Platform for the Identification and Treatment of Cancer (Dendritic Nanotechnologies), 4) Maximizing the Productivity of Agriculture (Univ. of Toronto Joint Center for Bioethics Canada), 5) Making Powerful Information Technology Available Everywhere (Lucent Technologies), 6) Enabling the Development of Space-From Carbon Nanotubes to the Space Elevator (Liftport Group).

Other topics address in the Application and Policy Section include Assessing Risks of Nanoscale Materials (The Cadmus Group), Federal Government Regulation of Nanotechnology: Present and Future Trends (Central Michigan Univ.), Fox & Henhouse: Is the Public Interest Being Protected (Rainforest Action Network), Nanotechnology and the Environment (Act Now Productions), Nanotechnology Investment Today (Harris &

Harris), Pathway to Atomically-Precise Nanomanufacturing (Zyvex), Intellectual Property in Nanotechnology (Panel), Public Equity Roundtable and others.

In addition, government policy makers from the USA (Floyd Kvamme, Co-chair of President`s Council of Advisors on Science and Technology and Partner of Kleiner Perkins), Germany (Volker Rieke, Minister-Counselor of Science, Technology and Environment, Germany Embassy) and Ireland (Helena Acheson, Head of Division, Science, Technology & Innovation Policy and Awareness Division, Forfas) presented Nanotechnology policy for innovation, commercialization, and advancing benefits. The Science and Technology Advisor to the Secretary of State (STAS) Dr George Atkinson, presented Nanotechnology and Foreign Policy addressing science and technology, in particular nanotechnology impact on national interests of international affairs including National Security, Economic Prosperity, Law Enforcement, Humanitarian Response and Global Issues. Details about STAS objectives and initiatives can be found at its website <http://www.state.gov/g/stas/>.

The rest of the two day conference covered Research which much focus on molecular assembly, biomolecular engineering, simulations on mechanical engineering of nanomachines, nanoscale fabrication, nanosystem design and etc. Presentations include topics such as Molecular Nanotechnology (US Naval Surface Warfare Center), Computation and Modelling for Nanomechanical Engineering (Nanorex), Design of Intelligent Biological Probes Driven by Motor Proteins (AIST, Japan), Nanoparticle and Molecular Biosensor Controlled In-Situ Production of Therapeutic Genes in Single Cells for Nanomedicine (Purdue Univ.), Self-propelled Nanomachines (Univ. of Toronto), Shortcut to Nanofactories: Assembling Big Blocks Instead of Little Atoms (Center for Responsible Nanotechnology), Computational Protein Design (Caltech and Howard Hughes Medical Institute), Novel Methods of Nanoscale Fabrication and Assembly (Northwestern Univ.), Engineering Artificial Biomedical Circuits (Weizmann Institute of Science, Israel), Sculpting Bio-materials by Programmable Assembly of RNA (UC Santa Barbara) and others. Dr Hiroshi Yokoyama, Director of the Nanotechnology Research Institute of AIST and also the International Conference Chair presented an overview on Nanotechnology Research in Japan which is the only Asia keynote speaker at the conference.

For more details about the conference, please visit the Foresight Nanotech Institute website at [www.foresight.org](http://www.foresight.org).



Dr Malcolm O'Neil, VP and CTO, Lockheed Martin presenting Aerospace Perspective on Nanotechnology for Energy.



Dr BJ Stanbery, CEO of HelioVolt presenting his company's lowest cost, highest performance, most versatile Solar Power Platform in the world during the Foresight Nanotech Challenge #1- Meeting Global Energy Needs with Clean Solution Panel- Nanotech for Clean Energy.



Tom Kalil, Special Assistant to the Chancellor for Science and Technology, UC Berkeley (former economy advisor for the Clinton Government and an vital figure in the establishment of USA NNI) presenting Maximizing Value for the National Nanotechnology Initiative - UC Berkeley Case Study.



Shannon Lloyd, Senior Environmental Specialist from First Environment Inc. presenting Capturing the Environmental Benefits of Nanotechnology.



Adam Werbach from Act Now Production, a Conservationist and former President of Sierra Club, presenting Nanotechnology and Environment and claimed that the Federal government is under-investing, and 10-fold increase in public research is needed.



Charles Harris, the Foresight Application Conference Co-Chair, Chairman and CEO of Harris & Harris presenting Nanotech Investment Today. Harris & Harris is one of the First and Most active Nanotechnology Venture Capital Investors and have invested 21 nanotech companies.



Peter Singer, Director of University of Toronto Joint Center for Bioethics, Canada presenting Foresight Nanotech Challenges #4: Maximizing the Productivity of Agriculture where he outlined the Future Directions for Nanotechnology in Agriculture and Food Systems. He also presented the ETC group activities.



James Von Ehr, Chairman and CEO of Zyvex presenting Pathways to Atomically-precise nanomanufacturing where he emphasized that “ Size is not the issue, but precision is. We want to make precise stuff in all length scale.”