

# Japan-US Workshop on the Future of Sensors and Sensor Systems

*Collaboration program between The Science Council of Japan  
and The National Academies (USA)*

## Program

February 28 - March 2, 2005

Tsukuba, Japan



### Monday, February 28, 2005

- 9:00 AM      **Welcome Remarks**  
*Teruo Kishi, Vice President, the Science Council of Japan, President of NIMS*
- Opening Address**  
*Tateo Arimoto*  
*Director-General, Science and Technology Policy Bureau, MEXT, Japan*  
*George H. Atkinson,*  
*Science and Technology Adviser to the Secretary of State, USA*
- 9:20 AM      **“Keynote Lecture – US”**  
**Sensor Systems in Support of Human Decisions**  
*Lewis Branscomb, Professor Emeritus, Harvard University*
- 9:40 AM      **“Keynote Lecture – Japan”**  
**Material Designs for Advanced Sensing in Japan**  
*Hiroaki Yanagida, Professor Emeritus, University of Tokyo*
- 10:00 AM      **Coffee Break**
- 10:15 AM      **Session I: Sensor Challenges and Goals**
- Panel I: Sensors Overview**  
*Moderator: Shigeyuki Kimura, The Society of Non-Traditional Technology*
- 10:20-10:35 **“Sensor Applications Overview: US Perspective”**  
**Bioinformatics Approach to Biosensors**  
*R. Paul Schaudies, Science Applications International Corporation*

- 10:35-10:50 **Interfacial Chemistry and Sensors**  
*Kohei Uosaki, Graduate School of Science, Hokkaido University*
- 10:50-11:00 **Panel Discussion**
- 11:00 AM **Panel II: Recent Innovations**  
*Moderator: Kohei Uosaki, Graduate School of Science, Hokkaido University*
- 11:05-11:20 **Nano-Materials**  
*Teri Odom, Northwestern University*
- 11:20-11:35 **Sensor Materials**  
*Perena Gouma, SUNY-Stonybrook*
- 11:35-11:50 **Thermoelectric Gas Sensors**  
*Norimitsu Murayama, National Institute of Advanced Industrial Sci & Tech (AIST)*
- 11:50-12:05 **Controlling of structures and properties of oxide thin films and interfaces**  
*Naoki Ohashi, National Institute for Materials Science (NIMS)*
- 12:05-12:45 **Panel Discussion**
- 12:45 PM Lunch and Poster Session
- 1:45 PM **Session II: Sensor Technologies**
- Panel I: Optical & Physical Technologies – US and Japanese Perspective**  
*Moderator: Sheikh Akbar, Ohio State University*
- 1:45-2:00 **Photonic Atoms and Photonic Molecules as Bio-sensors**  
*Stephen Arnold, Polytechnic University*
- 2:05-2:20 **Development of Thermally Stable, Visible-blind Deep-UV Diamond Sensors**  
*Yasuo Koide, National Institute for Materials Science (NIMS)*
- 2:20-2:35 **Differential Electrode Equilibria: A More Comprehensive Potentiometric Sensor Mechanism**  
*Eric Wachsman, University of Florida*
- 2:35-2:50 **Infrared and Ultrasonic Sensors Using Ferroelectric Thin Film**  
*Masanori Okuyama, Osaka University*
- 2:50-3:05 **Flexible Piezoelectric Sensors for Medical Applications**  
*Naohiro Ueno, National Institute of Advanced Industrial Science and Tech. (AIST)*
- 3:05-3:30 **Panel Discussion**
- 3:30 PM **Coffee Break**

- 3:45 PM **Panel II: Chemical & Biological Technologies – US and Japanese Perspectives**  
*Moderator: Duncan Moore, University of Rochester*
- 3:50-4:05 **Chemical Sensors: Challenges and Opportunities**  
*Sheikh Akbar, Ohio State University*
- 4:05-4:20 **Design of Heterojunction Type Chemical Sensors for Environmental Pollution Monitoring**  
*Yoshinobu Nakamura, University of Tokyo*
- 4:20-4:35 **MEMS and NEMS: Impact on Biotechnology**  
*Marc Madou, University of California-Irvine*
- 4:35-4:50 **New DNA Sensors– Nanomaterials and MEMS Devices for Biosensing**  
*Eiichi Tamiya, Japan Advanced Institute of Science and Technology*
- 4:50-5:05 **Bio-membrane Mimetic Systems**  
*Takatoshi Kinoshita, Nagoya Institute of Technology*
- 5:05-5:20 **Genetic Analysis Based on Intrinsic Molecular Charges**  
*Yuji Miyahara and Toshiya Sakata, NIMS\**
- 5:20-5:50 **Panel Discussion**
- 5:50-6:30 PM **Poster Sessions**
- 7:00 PM Welcome Reception

## Tuesday, March 1, 2005

- 9:00 AM      **Session III: Sensor Informatics**
- Panel I: Sensor Informatics**  
                 *Moderator: Masayuki Fujimoto, Shizuoka University*
- 9:05-9:20    **Bioinformatics Approach to Biosensors**  
                 *R. Paul Schaudies, Science Applications International Corporation*
- 9:20-9:35    **Netted Sensors: Information Management Challenges**  
                 *Laurens Danny Tromp, Mitre Corporation*
- 9:35-9:50    **Uncooled Infrared Focal Plane Arrays**  
                 *Munehisa Takeda, Mitsubishi Electric Company*
- 9:50-10:05   **A Study on Sensor Based Communication Robot**  
                 *Michita Imai, Keio University*
- 10:05-10:30   **Panel Discussion**
- 10:30 AM     **Coffee Break**
- 10:45 AM     **Panel II: Sensor Network Systems**  
                 *Moderator: Toni Marechaux, U.S. National Academy of Engineering*
- 10:50-11:10   **Data Issues in Large Sensor Networks**  
                 *John Orcutt, University of California - San Diego*
- 11:10-11:30   **Optical Fiber Sensors and Systems**  
                 *Anbo Wang, Virginia Tech*
- 11:30-11:45   **Towards Ubiquitous Sensor Network Infrastructure**  
                 *Haruhisa Ichikawa, NTT Group*
- 11:45-12:00   **Intelligent Context Probe for Ubiquitous Computing**  
                 *Atsushi Kashitani and Keiji Yamada, NEC*
- 12:00-12:30   **Panel Discussion**
- 12:30 PM     **Lunch and Poster Session**
- 2:00 PM      **Panel III: Social Issues, Trends and Implications of Sensors and Sensor Systems**  
                 *Moderator: Keiji Yamada, NEC*
- 2:05-2:20    **Human Interface and Societal Needs**  
                 *Terry Dishongh, Intel Corporation*

- 2:20-2:35     **Integrated Micro and Nano Sensing Systems**  
*Nan Marie Jokerst, Duke University*
- 2:35-3:00     **Biosensors for Clinical and Environmental Analyses**  
*Isao Karube, Tokyo University of Technology*
- 3:00-3:15     **Trends and Implications of Network Systems**  
*Duncan Moore, University of Rochester*
- 3:15-3:40     **Panel Discussion**
- 3:40-5:00 PM **Poster Sessions**
- 7:30 PM       Banquet

**Wednesday, March 2, 2005**

9:00 AM **Session IV: The Future of Sensor Technology: Breakthroughs and Potential Obstacles**

**Panel I: The Future of Sensor Applications**

*Moderator: R. Paul Schaudies, Science Applications International Corporation*

9:05-9:20 **Chemical Sensors for Aerospace Applications**

*Gary Hunter, NASA – Glenn Research Center*

9:20-9:35 **Sensor Arrays, Artificial Senses, Awareness, Intelligence**

*Joseph Stetter, Illinois Institute of Technology*

9:35-9:50 **Sensors for Large-Scale Structures**

*Minoru Sugita, Ohsaki Research Institute Inc.*

9:50-10:05 **Situation and Sensor in Security of Japan**

*Norio Muto, ALSOK Corporation*

10:05-10:40 **Panel Discussion**

10:40 AM **Coffee Break**

11:00 AM **Panel II: The Future of Sensor Network Systems**

*Moderator: Nan Jokerst, Duke University*

11:05-11:20 **Sensor Systems in Chem/Bio Defense**

*Duane Lindner, Sandia National Laboratories*

11:20-11:35 **The Future of Sensor Networks**

*Laurens Tromp, Mitre Corporation*

11:35-11:50 **Networked Sensing for Safely Using Mobile Nodes**

*Yoshito Tobe, Tokyo Denki University*

11:50-12:30 **Panel Discussion**

12:30 PM **Lunch and Poster Session**

2:00 PM **Panel III: The Future of Sensor Technologies**

*Moderator: Nobuo Takeda, University of Tokyo*

2:00-2:15 **Optical Fiber Sensors for Structural Health Monitoring**

*Nobuo Takeda, University of Tokyo*

- 2:15-2:30     **The Challenges and Benefits of Developing Tunable MEMS-Based Chemical Sensors**  
*Steve Semancik, National Institute of Standards and Technology (NIST)*
- 2:30-2:45     **Molecular Recognition Using Nanomechanical Sensors**  
*Thomas Thundat, Oak Ridge National Laboratory*
- 2:45-3:00     **Development of CO Selective Gas Sensors**  
*Osamu Okada, Renaissance Energy Research Co.*
- 3:00-3:15     **Sensors for Damage Detection in Structural Materials**  
*Hideaki Matsubara, Japan Fine Ceramics Center*
- 3:15-3:30     **Design of Nano Electrode for Dilute Pollutant Gas Sensor**  
*Jun Tamaki, Ritsumeikan University*
- 3:30-4:00     **Panel Discussion**
- 4:00 PM       **Concluding Remarks**  
*Duncan Moore, University of Rochester  
and Teruo Kishi, President of NIMS*