

## H. R. H. Princess Sirindhorn of Thailand Visits AIST AIST Participated in the National Science and Technology Fair 2006 in Thailand

Her Royal Highness Princess Maha Chakri Sirindhorn of the Kingdom of Thailand visited AIST Tsukuba on August 22, 2006. Also known as the “Princess of Technology” or the “Princess of Information Technology,” Princess Sirindhorn is well versed in science and technology and highly admired by the Thai people as the intellectual successor to His Majesty the King.

Princess Sirindhorn was accompanied by her niece Khun Sirikittiya Jensen; H.E. Mr. Suvidhya Simaskul, Ambassador of Thailand to Japan, and his wife Mrs. Boontipa Simaskul; Dr. Paritud Bhandhubanyong, Director of the National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA); and 25 Thai officials.

After being warmly welcomed by the top officials and visiting Thai researchers at AIST Tsukuba, Princess Sirindhorn visited Science Square Tsukuba (SST), the hands-on museum of AIST. At SST she observed a number of state-of-the-art technologies, including standards and measurement technologies, a tactile display system for people with severe visual impairments, a single-crystal TMR device, an electromyogram interface, and an intelligent wheelchair. She then toured the Open Space Laboratory (OSL) Building where she inspected a photovoltaic power generation system and an exploratory humanoid robot.

We at AIST were deeply impressed with the great interest Princess Sirindhorn showed in our technologies, asking many questions and taking notes and pictures herself. We would like to express our sincere gratitude again to Princess Sirindhorn, who took the time to visit us despite her tight schedule. We hope her visit will further promote partnerships in research between AIST and our Thai counterparts.

In fact, Princess Sirindhorn’s visit to AIST Tsukuba reflected the recent growth of such partnerships, although it was arranged while Princess Sirindhorn was in Japan to attend an international conference jointly organized by United Nations University and the United Nations Educational, Scientific and Cultural Organization (UNESCO). In June 2001, AIST concluded a specific research cooperation



agreement with the National Institute of Metrology Thailand (NIMT). AIST signed a general cooperation agreement in November 2004 with NSTDA and the Thailand Institute of Scientific and Technological Research (TISTR). Based on these agreements, AIST has strengthened its mutually supportive relations with these institutes strategically through workshops and joint R&D. Last year AIST jointly organized the Second Biomass-Asia Workshop in Bangkok with the Thai government and research institutes. In addition, AIST participated in the National Science and Technology Fair of Thailand in 2005 and 2006 and exhibited a number of technologies, including some of the products of joint research with its Thai counterparts.

The annual National Science and Technology Fair is organized by the Thai government as part of its ardent efforts to support S&T promotion and education. The 2006 Fair was held in the Bangkok International Trade and Exhibition Centre (BITEC) for 12 days from August 11 through 22. More than 1 million people in total, which included many primary and middle school students, visited the event.

Princess Sirindhorn toured the venue on the first day of the event. At our booths she inspected our exhibits with much interest. Among them were a minibus powered solely by biodiesel fuel (BDF)—a product of our joint research with NSTDA/TISTR; and our project to develop PARO, a seal-type mental commitment robot (AIST gave PARO to Princess Sirindhorn as a gift last year).

AIST exhibited under seven themes. Some of the products of our joint research with NSTDA and TISTR were presented using boards and videos with Thai translations as well as exhibits. Researchers from NSTDA, TISTR, other institutes, and universities helped us with our exhibition. Thanks in large parts to their help, all of our booths attracted many visitors. The BDF-powered minibus, which had been brought from Japan, carried visitors within the venue every day as a demonstration.

In Thailand as well we held a working-level meeting with researchers and officials of our counterparts on the progress and future prospects for joint research. The participants decided to chart the future course of action at the next round of the Thailand-Japan Collaboration Workshop (AIST-NSTDA-TISTR).



## International Workshop on Biochips and Environmental Monitoring

On August 17 and 18, 2006, the Third International Workshop on Biochips and Environmental Monitoring was held at AIST Kansai. The biennial workshop, which was organized this time by the Human Stress Signal Research Center (HSS), focused on the application of OMICS (genomics, proteomics, and metabolomics) technology to environmental stress analysis and its future prospects. A total of 76 researchers participated, including those from the US, Germany, the UK, and South Korea.

It started off with opening remarks by Hitoshi Iwasaki, Deputy Director of HSS and the organizer of the workshop; and Etsuo Niki, Director of HSS. A total of 11 lectures were given on the first day, focusing on genomics and proteomics and covering a wide range of species of animals, plants, microorganisms, etc. Some of the lectures concerned innovative and promising technologies that have already been put to practical application. In addition, young researchers from Japan, South Korea, etc. gave a total of 19 poster presentations.

The second day of the workshop focused on metabolomics, and 5 lectures were given. Researchers in metabolomics have been competing with one another to refine analytical methods, including nuclear magnetic resonance spectroscopy (NMR), gas chromatography-mass



spectrometry (GC-MS), and capillary electrophoresis-mass spectrometry (CE-MS).

Among the lecturers were Dr. Oliver Jones doing research at the University of Cambridge under the leadership of Dr. Jules L. Griffin, the leading authority on NMR-based metabolomics analysis; Dr. Tomoyoshi Soga of the Keio University, the top-ranking expert in CE-MS-based metabolomics analysis; and Dr. Wolfram Weckwerth of the Max Planck Institute of Molecular Plant Physiology, who was studying intensively in GC-MS-based metabolomics analysis. The workshop offered an invaluable opportunity to learn about the latest developments in these analytical methods at one time, providing important clues as to the future of these technologies.

The next workshop will be held in South Korea in 2008.

## A Delegation of NRC Canada Visits AIST

On September 8, 2006, a delegation of the National Research Council of Canada (NRC Canada) led by its president, Dr. Pierre Coulombe, visited AIST Tsukuba. They were welcomed by AIST Senior Vice-President Kisaburo Kodama and briefed on AIST by Vice-President Masakazu Yamazaki. They then toured some of the research units at AIST Tsukuba: the Energy Technology Research Institute, the Metrology Institute of Japan, the Institute for Human Science and Biomedical Engineering, and the Nanotechnology Research Institute.

NRC is best known for the innovative achievements of its institutes, which include the invention of the pacemaker (1940s) and the cesium beam atomic clock (1960s). It has over 20 research institutes across Canada, with one or more institute in each province. With a staff of some 4,000 and a pool of about 1,200 guest researchers, NRC is similar to AIST in terms of the scale of its human resources.

This visit was made in the context of the increasingly



close relations between AIST research units and NRC institutes in recent years. In February 2006 two memoranda of understanding on research cooperation were signed. One was between the Metrology Institute of Japan and the Institute for National Measurement Standards regarding reference materials for the measurement and standardization of nanoparticles. The other involved cooperation in such fields as research projects, human resource development, and industrial applications between the Nanotechnology Research Institute of AIST and the National Institute for Nanotechnology. In July 2006 AIST invited Dr. Bruce Baskerville of NRC Canada to speak as a panelist at the Symposium on Strategic Research Evaluation held at AIST Tokyo Waterfront.

A new field for research cooperation was found. The delegation inspected the achievements of the Advanced Fuel Group, Energy Technology Research Institute, which focuses on the production of cleaner fuels from heavy hydrocarbon resources as well as the high-efficiency conversion and utilization of such resources. After returning home, the delegation contacted AIST for possible research cooperation regarding the large reserves of oil sand in the Province of Alberta, Canada.

We at AIST hope that this visit will further promote cooperative relations with NRC Canada.

## AIST Renews the General Research Cooperation Agreement with CNRS of France

AIST and the Centre National de la Recherche Scientifique (CNRS, National Center for Scientific Research) of France have renewed the General Agreement on Comprehensive Research Cooperation. AIST President Hiroyuki Yoshikawa and visiting CNRS President Catherine Bréchnignac signed the renewed agreement on November 6, 2006. They agreed that Yoshikawa will visit the CNRS headquarters in Paris in February 2007 to exchange views on innovation management as part of efforts to deepen the partnership between the two organizations. The original agreement was concluded on November 21, 2001, since which time AIST and CNRS have maintained a close partnership.

CNRS is the largest public research organization in France. It employs 12,000 researchers and 14,000 engineers. Its budget accounts for about 14% of the national S&T budget of some 16.8 billion EUR (FY2005). The focal points of its



research strategy include: (i) partnership; (ii) diversification; (iii) innovation; and (iv) multi-disciplinarity. CNRS promotes collaborations among government, industry, and academia. As part of such collaborations, many of the CNRS laboratories work in partnership with universities. CNRS is also committed to developing networks of innovation clusters across the country.

The partnership between AIST and CNRS covers many research fields. In robotics, AIST and CNRS operate joint laboratories — one in the Open Space Laboratory (OSL) at AIST Tsukuba, and the other in the Laboratory for Analysis and Architecture of Systems (LAAS) of CNRS in Toulouse, France—under a research cooperation agreement between the Intelligent Systems Research Institute and a CNRS department. In materials research for the development of next-generation optical discs, a specific research cooperation agreement is in place between the Center for Applied Near-Field Optics Research of AIST and CNRS/The University of Montpellier II. In environmental catalysis, a joint workshop involving the Energy Technology Research Institute and three other research units of AIST on the one hand and CNRS's research units and universities in France on the other have resulted in a closer partnership. They have agreed to collaborate on environmental catalyst technologies for the sustainable conservation of atmospheric and hydrospheric environments.

## AIST Co-organizes International Conference “Renewable Energy 2006”

From October 9 to 13, 2006 AIST co-organized a major international conference on all kinds of renewable energy titled “Renewable Energy 2006”, which was the first of its kind in Japan. The conference was held at Makuhari Messe near Tokyo. Under the slogan “Advanced Technology Paths to Global Sustainability,” Renewable Energy 2006 attracted 1,063 participants from 55 countries. The conference saw over 600 research presentations, inviting lively discussions.

AIST performed a variety of activities in addition to making a number of research presentations. For example, AIST organized a special session titled “AIST Session: Energy Vision for Future.” In the associated event “1st Renewable Energy International Exhibition,” AIST exhibited state-of-the-art technologies in such fields as photovoltaics, biomass, geothermal power, fuel cells, and power electronics. AIST also joined forces with the Agency for Energy Management and Environment (ADEME) of France to organize an expert meeting on low-energy buildings.

The AIST Session started off with a keynote speech on the energy technology outlook for 2100 by Makoto Akai, Principal Research Scientist of the Energy Technology Research Institute, AIST. This was followed by a number



of informative lectures on the present state and future prospects of advanced technologies in this field. The lecturers included: Dr. Walter Kohn of the US, a Nobel Laureate in Chemistry (solar power); Dr. John W. Lund of the US (geothermal power); Dr. Ralph P. Overend of Canada (biomass); Dr. Teresa Pontes of Portugal (ocean energy); Dr. Goran Strbac of the UK (energy systems); and Dr. Satoshi Morozumi of NEDO, Japan (energy systems).

AIST booths attracted many visitors in the exhibition. A total of over 20,000 people visited the exhibition as a whole, in which 208 exhibitors participated.

Renewable Energy 2006 was closed with the pledge to further support the R&D and promotion of renewable energy.

## Japan-Thailand Collaboration Workshop 2006

On November 14 AIST Tsukuba hosted the Fourth Japan-Thailand Collaboration Workshop 2006. A total of nearly 40 people from Thailand participated, including Dr. Sakarindr Bhumiratana, President of the National Science and Technology Development Agency (NSTDA); and Dr. Nongluck Pankurdee, Governor of the Thailand Institute of Scientific and Technological Research (TISTR). The participants from AIST were Senior Vice-President, Kisaburo Kodama, Vice-President, Masakazu Yamazaki, and many researchers involved in related joint research projects.

Under the general agreements between AIST and NSTDA, and TISTR concluded in November 2004, AIST is working on eight joint research projects. Three of them are New Energy and Industrial Technology Development Organization (NEDO) projects consisting of two “proposal-based” projects and a “leading research” project. The other five projects are funded by the NEDO Grant for International Joint Research.

The 2006 Workshop covered 14 themes. Some of them matched the ongoing joint research projects in such fields as IT, environmental energy, and nanotechnology/materials. The other themes were selected based on requests from the Thai participants, including



biodiesel fuel, the installation and standardization of photovoltaic experiment equipment, photocatalyst-based environmental purification technology, biomass promotion, and the application of

IT and robots to the treatment of the disabled.

The fifth workshop will be held in late October 2007, expanding its scope to innovation management as well. AIST will participate in a series of Thailand-related events, including the Asian conference on the GEO Grid and a meeting on the efficacy of the mental commitment robot PARO in treating autistic children, both in Bangkok in March; and the National Science and Technology Fair 2007 in mid August.

On November 15, Dr. Sakarindr and Dr. Nongluck met with President of AIST, Hiroyuki Yoshikawa, in Tokyo. They appreciated the fact that the three organizations had successfully been strengthening cooperative relations. This fact was reflected in the research partnerships and personal exchanges as reviewed in the workshop the day before, as well as a series of recent events like the Biomass-Asia Workshop in December 2005, AIST’s participation in the National Science and Technology Fair 2006 in Thailand, and H.R.H. Princess Sirindhorn’s visit to AIST. The heads of the three organizations agreed to further strengthen the partnership to produce more tangible outcomes.

## AIST-VAST Workshop

On November 20, 2006, AIST Tsukuba held a general workshop with the Vietnamese Academy of Science and Technology (VAST).

This was the third workshop of its kind since the two organizations signed a general agreement on research cooperation in Hanoi in December 2004, when the First AIST-VAST Workshop was held concurrently. The Second Workshop took place in Tsukuba in October 2005. Also, the GEO Grid workshop was held in Hanoi in March 2006.

The present workshop was attended by 44 participants, including VAST Vice-President Nguyen Khoa Son and 13 researchers from Vietnam and the rest from AIST.

They worked on an array of themes regarding environmental management such as wastewater treatment, biomass-related technology, marine geology, the GEO Grid, multilingual processing, and open source software. The participants reviewed the developments in the AIST-VAST partnership since the last workshop.

Vietnam is facing such challenges as worsening environmental pollution, growing energy demand, and lagging infrastructural



development while experiencing solid economic growth. The workshop participants agreed that increasingly serious environmental degradation in the Mekong River Delta should be addressed by a combination of environmental monitoring (involving the GEO Grid and marine geology), environmental restoration (water quality improvement, etc.), and biomass technology application. They recognized the importance of the promotion of an Asian GEO Grid with Thailand as well as the development of networks involving multilingual processing and other information technology. Industrial wastewater treatment was another case in point. VAST and AIST agreed to work together more closely with a view to formulating a specific project to address this issue.

They appreciated the growing exchange/network of researchers with the help of the AIST Fellowship and other programs. They also discussed future activity plans. A major issue was how to win so-called “competitive research funds” from Japan. The GEO Grid workshop, scheduled for March 2007 in Bangkok, will expand its scope to include Thailand as well Vietnam.

The Fourth AIST-VAST Workshop was decided to be held in Vietnam the coming autumn. They agreed to work even harder to develop partnerships in various fields until then.