The role that information communications should play in the advancement of the society and economy is of great importance. NTT has an objective to contribute to the development of information communications in Japan, and all around the world as well, by disseminating our research and development results. To achieve the objective, we are energetically developing the activities shown as follows.

### 2008 Symposia/Forums Schedule (arranged chronologically)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>NTT Communication Science Laboratories Open House * Mirai-soron 2008</td>
<td>May 29-30, 2008</td>
<td>NTT Keihanna Building (Kyoto)</td>
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<tr>
<td>Tsukuba Forum 2008</td>
<td>October 15-16, 2008</td>
<td>NTT Tsukuba R&amp;D Center Tsukuba International Congress Center</td>
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<tr>
<td>NTT Lecture for Citizens Transformation of Network Life by Cutting-Edge Technology</td>
<td>October 29, 2008</td>
<td>Yokosuka Arts Theatre</td>
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<tr>
<td>NTT Basic Research Laboratories Science Plaza 2008</td>
<td>November 21, 2008</td>
<td>NTT Atsugi R&amp;D Center</td>
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<tr>
<td>NTT R&amp;D Open Lab 2009</td>
<td>January 17-18, 2009</td>
<td>NTT Musashino R&amp;D Center</td>
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<tr>
<td>NTT R&amp;D Forum 2009</td>
<td>February 19-20, 2009</td>
<td>NTT Musashino R&amp;D Center</td>
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The theme of this year's NTT R&D Forum was “The NGN opens up a new chapter of communication service” and was put on as a joint effort by the three NTT laboratory groups. Held at the NTT Musashino R&D Center on February 19 and 20, the forum drew a good-sized crowd of 4,500 visitors who had an opportunity to view a wide range of R&D projects and working demonstrations.

Besides the keynote addresses, special lectures, presentations, and panel discussions, the achievements of NTT R&D were introduced from the viewpoint of three exhibit categories: “Themes of NGN services—including (1) Various services, and (2) Service elements,” “Basic technology for support services,” and “Innovative Technology section.” The “Themes of NGN services” in particular were presented as a story that made the entire process of NGN service deployment clear and easy to understand. The NTT History Center of Technologies at Musashino was also opened up for the two days of the forum, and many enjoyed the exhibits which chronicle NTT's history all the way back to when the corporation was still a public monopoly (denden kosha) and NTT's rich history of technological achievement.

This year's forum was a tremendous success for it gave the guests a chance to see the full range of R&D initiatives, and experience NTT's steady progress and achievements first hand. The forum is also extremely valuable to the company for the input and feedback we receive from the guests regarding the services that they envision and expect.
NTT Communication Science Laboratories (NTT CS Labs) held an event “the NTT CS Labs Open House * Mirai-soron 2008” on May 29 and 30 at the NTT Keihanna Building, Kyoto, Japan. This event consisted of an open house and a series of lectures such as forums entitled “Mirai-soron.” The open house presented exhibits of the latest research achievements and the Mirai-soron forums imagined and discussed our future.

The series of lectures started with an opening lecture by Dr. Yoshinobu TONOMURA, director of the laboratories, entitled “Communication of the Future with Sensing and Knowing to the Heart.” This was followed by four other Mirai-soron forums: “Considering Communication Environment from the Human Point of View,” “Future Child Care: What the Media and Science Can Do for It,” “Communication Scene Analysis: Methods, Technologies, and Vision for the Future,” and “Data Mining x Marketing: What Do We Need for Successful Research Incubation?”


Close to 1,000 guests attended the NTT CS Labs Open House * Mirai-soron 2008 event giving the guests a chance to see the full depth and range of research being conducted at the labs, and giving us an opportunity to exchange opinions through discussions and to receive valuable feedback from the guests. Members of the press were also in attendance, and the event received extensive coverage in the media.
Tsukuba Forum 2008

The year 2008 was the inaugural rollout of commercial NGN, thus marking the beginning of a new era of richer communications based on better quality and more reliable services. In this landmark year, the Tsukuba Forum, which has now become one of the most anticipated events of the fall season, addressed the theme “Access Networks: Support for a Robust Next-Generation Infrastructure and Secure Operating Environment.”

Leading-edge optical access technologies incorporate contributions from many different sources: of course the efforts of NTT Access Network Service Systems Laboratories that hosted this year's event, but also numerous R&D advances from all the other NTT research laboratories, and many other companies in the NTT group and industry at large. All this year's events were well attended including the keynote speech and special lectures at the Tsukuba International Congress Center, the workshops orchestrated by the project manager, and the various technical sessions led by prominent engineers.

Distinctive features of this year's forum were the division into three technology sectors, and the special FTTH corner charged with introducing the exhibition hall. The joint exhibit by the operating companies in collaboration with the Japan Industrial Association for Telecommunications Equipment and Materials (JATEM, Zentsukyo) was also well received, and the display of actual equipment that visitors could handle and examine close-up proved to be a popular and practical introduction to network access equipment.

The forum not only provided an excellent overview of the latest R&D and trends at NTT Access Network Service Systems Laboratories, it also gave people a good idea of how access networks are likely to evolve in the years ahead.
Hosted by NTT Basic Research Laboratories (BRL), “Science Plaza 2008” was an open-house event held at NTT Atsugi R&D Center on Friday, November 21, 2008. Under the banner “Nanoscience Opens Up the Quantum World”, the event introduced the latest research findings to a broad audience both inside and outside of NTT, and provided an excellent forum for having stimulating discussion with the attendees.

The lecture hall was crowded in the morning session for an interesting talk entitled “Stopping and Confining Light: Controlling Light with Photonic Crystals” by Dr. Masaya Notomi, Distinguished Technical Member, and Leader of the Photonic Nano-Structure Research Group at the BRL. In the afternoon session, Prof. Hiroyuki Sakaki, Vice-President of the Toyota Technological Institute, gave a thought-provoking special lecture on “Nano-Space Quantum Physics and the 21st Century World: Thoughts on How Science and Technology Should Proceed in the Years Ahead.”

This year some 48 posters were presented detailing much of the recent work and latest research findings from researchers at NTT Basic Research Laboratories, Photonics Laboratories, and Microsystem Integration Laboratories. In addition, the facilities lab tour allowing visitors the rare chance to visit research laboratories including a clean room was a great crowd-pleaser.
Targeting recent graduates and potential new recruits, “NTT R&D Open Lab 2009” was hosted by three NTT laboratory groups around the theme “Understanding the Work of NTT Labs in 2 Days.”

Held over the weekend of January 17 and 18, at NTT Musashino R&D Center, some 1,051 people turned out for the event and saw numerous examples of the R&D work done at NTT laboratories.

A wide range of events and activities were planned for the two-day fair including statements of corporate vision by directors of the three NTT laboratory groups, introductions with demonstrations of work done at the different labs, lectures on some of the latest cutting-edge technologies, informal sessions where younger engineers describing what it’s like to work at NTT, roundtable discussions with researchers were interspersed with comic Monkey Chack routines familiar from the Chie no Warai website. Job recruiters and consultants were also on hand to chat with the graduates.

This open lab event provides an excellent opportunity for potential applicants to talk one-on-one with younger researchers who actually work at NTT, and especially when exposed to the dazzling demonstrations of NTT’s impressive R&D achievements, the job fair has been highly effective at generating interest and recruiting new talent to work for NTT.
Publishing of Technical Magazines

NTT had published the following two technical magazines with the aim of disseminating research and development results.

(1) NTT Gijutsu Journal (monthly magazine in Japanese)

Provides technical information on a wide range of subjects from the development of new technologies and services and the growth of various business lines in the NTT Group. It explains new technology trends in a straightforward manner for general readers.

■ 2008 Feature Articles
Knowledge Creation Design Methodology for Service Innovation, NGN Mobile Communication Technologies for Large-capacity and High-efficiency Communications in the Flat-rate Era, Applied Technology for Millimeter and Terahertz Electromagnetic Waves, etc.

(2) NTT Technical Review (monthly magazine in English)

In line with the globalization of NTT Group businesses, the NTT Technical Review is issued as a monthly magazine in English and aims to communicate NTT’s R&D results and activities worldwide. (Web-site-version only posted from April 2007)

■ 2008 Feature Articles
Approaches to Storage-centric Terminal Environment, Natural Language Processing Technologies for Portal Services, Light Source Technologies for Sensing Applications, etc.

Patents and Technology Disclosures

In addition to enthusiastically obtaining patents, technology resulting from research and development across a wide range of fields is provided at a reasonable cost so that it can be utilized in the industrial world when required.

■ Applications for R&D patents

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<thead>
<tr>
<th>Year</th>
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<tr>
<td>2006</td>
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<td>2007</td>
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<td>2008</td>
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(Fiscal year)

■ Major technology disclosure

<table>
<thead>
<tr>
<th>Year</th>
<th>Technology</th>
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| 2006 | ● Context-aware Information Provision to the Mobile Phone Standby Display  
● Single Sign-on Software I-dLive  
● Stereo Echo Cancelling Software |
| 2007 | ● The System of Animation Creation by Visual Programming  
● Human Area Networking System  
● IPTV System Software |
| 2008 | ● KTN Optical Scanner  
● Low-friction Indoor Optical Fiber  
● H.264 Video Codec |
The results of research and development activities carried out at our research laboratories are frequently announced at domestic and international conferences and in specialized scientific journals. These activities inspire more research and development into the field of information communications and contribute greatly to the development of science and technology.

Based on its comprehensive range of research and development on information communications, NTT has been active in fora and consortia, which are recently playing leading roles, as well as in standardization organizations such as ITU-T, ISO. These activities also contribute to the orderly development of worldwide information communications.

- Participation in standardization organizations such as ITU and TTC (fiscal 2008)
  - Participants to domestic/international SDO* total 577
  - Members of domestic committee total 365

- Number of participation in international standardization meetings (fiscal 2008)
  - 3,318 man-days (Excluding preparatory studies)

- Percentage of contributions submitted to ITU-T (2005-2008 study period)
  - NTT 5.9%
  - Japan (Excluding NTT) 5.8%
  - Other countries 88.3%

### Main Commendations and Prizes Awarded in 2008

<table>
<thead>
<tr>
<th>Organization and Award</th>
<th>Items and Recipient</th>
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<tbody>
<tr>
<td>The Nikkan Kogyo Shinbun Japan Industrial Technology Grand Prix (MEXT Prize)</td>
<td>Development of Next Generation Network Technology, (Satoshi Miura)</td>
</tr>
<tr>
<td>Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology</td>
<td>Research of Highly Efficient Speech and Audio Coding Technologies, (Takehiro Moriya)</td>
</tr>
<tr>
<td>Joho Gekkan Promotion Council Joho Gekkan Award for Individual Contribution to Informatics</td>
<td>Ministry of Economy, Trade and Industry Commerce and Information Policy Bureau Chairman's Award, &quot;Information Security Promotion Category&quot;, (Tatsuaki Okamoto)</td>
</tr>
<tr>
<td>Communications Association Maejima Award</td>
<td>Research of Highly Efficient Speech and Audio Coding Technologies and Their Standardization, (Takehiro Moriya)</td>
</tr>
<tr>
<td>Communications Association Maejima Award</td>
<td>Development of OFDM Wireless LAN Systems, (Masahiro Morikura, others)</td>
</tr>
<tr>
<td>Communications Association Maejima Award</td>
<td>Development and International Standardisation of Electromagnetic Compatibility Related to Telecommunication, (Fujio Amamiya, others)</td>
</tr>
<tr>
<td>Association of Radio Industries and Businesses The Meritorious Award on Radio (Association of Radio Industries and Businesses Chairman's Award)</td>
<td>Development of Ku-band Maritime Broadband Satellite Communication System by the Earth Stations on Board Vessels (ESV), (Toshihiro Serita, others)</td>
</tr>
<tr>
<td>Japan Electric Association The Shibusawa Award</td>
<td>Development Group on High Frequency Inverter Fluorescent Light that Reducing Electromagnetic Noise and Environment Impacts, (Shin Kanno, others)</td>
</tr>
<tr>
<td>National Commendation for Invention The Invention Prize</td>
<td>1-chip MPEG-2 HDTV CODEC LSI, (Ken Nakamura, others)</td>
</tr>
<tr>
<td>IEEE Distinguished Lecturer</td>
<td>(Shoji Makino)</td>
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</table>

### Number of R&D Personnel

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of R&amp;D Personnel (Person)</th>
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<tbody>
<tr>
<td>2006</td>
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<td>2007</td>
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<td>2008</td>
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### R&D Expenditure

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<tr>
<th>Fiscal Year</th>
<th>R&amp;D Expenditure (100-Million Yen)</th>
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<tbody>
<tr>
<td>2006</td>
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<td>2007</td>
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<td>2008</td>
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Mission of Laboratories

**Cyber Communications Laboratory Group**: Research and development of technologies and products for the broadband and ubiquitous services which people can enjoy safe and rewarding lives.

**Cyber Solutions Laboratories**: Research and development of products and services for broadband and ubiquitous services.

**Cyber Space Laboratories**: Research and development into component technologies related to the handling of different media, needed for broadband and ubiquitous services.

**Information Sharing Laboratory Group**: Research and development of infrastructure technology and products to support the next-generation of network services.

**Service Integration Laboratories**: Strategic investigation on R&D themes, research and development on network architecture and basic technologies for telecommunications quality and traffic, and coordinated promotion of commercial development across laboratory boundaries.

**Information Sharing Platform Laboratories**: Research and development on fundamental information and communication technologies that allow safe, secure, convenient, and economic use of various next-generation network services.

**Network Service Systems Laboratories**: Research and development of network services and advanced networks technologies that will support these services.

**Access Network Service Systems Laboratories**: Creation of new access service as a basis of information sharing business, and realization of access system network to support above-mentioned service.

**Energy and Environment Systems Laboratories**: Research and development of environmental information and communication technology (environmental ICT) that will bring about a revolution in living environments and energy systems.

**Science and Core Technology Laboratory Group**: Cutting-edge research and development leading to the creation of new principles and concepts that will revolutionize society.

**Network Innovation Laboratories**: Research and development of innovative communication technologies to establish fundamentals of future networks and their services.

**Microsystem Integration Laboratories**: Research and development on the cutting-edge technologies ranging from the device and the module to the subsystem that will be useful to support "broadband and ubiquitous services".

**Photonics Laboratories**: Research and development of optical and electronic components, modules, materials, and other core photonics technologies to achieve novel forms of information sharing.

**Communication Science Laboratories**: Discovery and creation of new approaches and concepts in intelligent communication, media information, and human science to revolutionize information communication technologies.

**Basic Research Laboratories**: Discover novel concepts in the field of network technology to overcome the present limitations in speed, capacity and size.

(As of March 31, 2009)