ATTACHMENT: Profile of the Group A Recipient of the 2012 C&C Prize

Dr. Osamu Yamada
Current: Guest Professor, Faculty of Science and Engineering, Waseda University
Personal History (born in 1944)

1967: Earned B.S. from the Faculty of Science and Engineering, Waseda University
1967: Joined NHK
1971: Moved to the NHK Science & Technology Research Laboratories (STRL)
1991: NHK STRL, Head of the Satellite Broadcasting Systems Research Division
1999: NHK STRL, Director-General
2002: Moved to Pioneer, Senior Executive Officer of the Research and Development Center
2003: President of E-Box
2003: Pioneer, Senior Executive Officer of the Corporate Research & Development Laboratories
2003: President of the Advanced PDP Development Center, Ltd.
2005: Pioneer, Senior Management Executive Officer, Director General of the Development Center and the Corporate Research & Development Laboratories
2007: Pioneer, Executive Corporate Adviser R&D
2009: Appointed Guest Professor, Faculty of Science and Engineering, Waseda University

Major Awards

1994: ITU-AJ Awards (ITU Association of Japan)
1997: The Meritorious Award on Radio (Ministerial), Japan
1998: Achievement Award (The Institute of Electronics, Information and Communication Engineers [IEICE]), Japan
1999: Science and Technology Minister Prize
2001: Inoue Harushige Prize (Japan Science and Technology Agency [JST])
2005: Achievement Award, IEICE, Japan
2006: Niwa-Takayanagi Prize, (The Institute of Image Information and Television Engineers [ITE]), Japan
2008: Maejima Prize, Tsushinbunka Association, Japan
2008: Radio Day Ministerial Commendations, Japan

Dr. Toru Kuroda
Current: NHK Science & Technology Research Laboratories, Deputy Head
Personal History (born in 1958)

1982: Earned M.S. from the Tokyo Institute of Technology
1982: Joined NHK, assigned to the NHK Nagano Broadcasting Station
1985: Moved to NHK STRL, Satellite Broadcasting Systems Research Division
1997: NHK STRL, Senior Research Engineer, Digital Broadcasting Systems Research Division
1999: NHK, Chief Engineer, Engineering Administration Department
2002: NHK, Deputy Head, General Affairs Department
2008: NHK, Deputy Manager, General Affairs Department
2009: NHK STRL, Head of the Broadcasting Networks Research Division

2011: NHK STRL, Head of the Planning & Coordination Division
2012: NHK STRL, Deputy Head

Major Awards

1995: Hoso Bunka Foundation Grant
1995: Ichimura Academic Award (The New Technology Development Foundation)
2000: National Commendation for Invention (Japan Institute of Invention and Innovation [JIII])
2000: International Cooperation Awards (ITU-AJ)
2009: National Commendation for Invention (JIII)
2012: ICT Encouragement Prize (The Telecommunications Association [TTA]), Japan

Mr. Masayuki Takada

Current: NHK Science & Technology Research Laboratories, Senior Research Engineer, Broadcasting Networks Research Division

Personal History (born in 1964)

1988: Earned M.S. from Tohoku University
1988: Joined NHK STRL, Satellite Broadcasting Systems Research Division
2001: Visiting Researcher, Communications Research Center (CRC), Canada
2004: NHK STRL, Senior Research Engineer [Digital Broadcasting Networks]
2008: NHK STRL, Senior Research Engineer, Broadcasting Networks Research Division

Major Awards

1992: Academic Encouragement Award (IEICE)
1995: Hoso Bunka Foundation Grant
1995: Ichimura Academic Award (The New Technology Development Foundation)
2000: National Commendation for Invention (JIII)
2006: Hoso Bunka Foundation Grant
2009: National Commendation for Invention (JIII)
2010: International Cooperation Awards (ITU-AJ)
2011: Hoso Bunka Foundation Grant
2011: Technology Promotion Awards (ITE)
2011: Radio Day Ministerial Commendations, Japan
2012: ITU-AJ Award

–Achievements–

In December 2003, a digital terrestrial television broadcasting (DTTB) system called ISDB-T (Integrated Services Digital Broadcasting-Terrestrial) was put to practical use in Japan. Since then, this system has been deployed very rapidly thanks to a high level of interest in high-quality television pictures and in One-Seg broadcasting for cellular phones, etc. This system has many technological features, such as efficient use of radio frequency resources, high-quality audio and video, capabilities for new data broadcasting services, and broadcasting to mobile terminals. After analog terrestrial television broadcasts ended in Japan on July 24, 2011, ISDB-T technology, including mobile TV, came to be viewed around the world as a key technology for broadcasting and communications.

Dr. Osamu Yamada, Dr. Toru Kuroda, and Mr. Masayuki Takada started their basic research on digital terrestrial broadcasting in the late 1970s, which is over a decade earlier than its development for practical use in the early 1990s. In 1986, they started basic research on new modulation technology (i.e., Orthogonal Frequency Division Multiplexing, or OFDM) for digital terrestrial broadcasting. In addition, in 1991, they first developed experimental OFDM equipment for broadcasting in Japan. Moreover, two years later, they carried out a field experiment using the OFDM broadcasting equipment and succeeded in the first mobile reception of television broadcasting in the world.

Their efforts led to the maximized and flexible use of limited frequency resources. They proposed and developed Band Segmented Transmission-OFDM (BST-OFDM), which divides a television channel signal into 13 segments. The BST-OFDM television system supplies high-definition TV broadcasting through the main segments and mobile-use broadcasting through residual segments (e.g., for the One-Seg broadcasting). Therefore, the system simultaneously satisfies requirements for efficiency, flexibility and mobility. Next, they integrated the technologies and services into an entire broadcasting system called Integrated Services Digital Broadcasting - Terrestrial (ISDB-T) for HDTV and One-Seg use based on the BST-OFDM technology.

An ISDB-T system has the following features:
- It can provide services for both stationary and mobile receivers simultaneously because BST-OFDM uses 13 OFDM segments with different transmission parameters to enable hierarchical transmission up to three layers.
- It simultaneously offers stable and robust receiving characteristics for both stationary and mobile receivers because the system has been primarily designed to meet stringent requirements for mobile broadcasting.
- An ISDB-T receiver can be easily applied for digital terrestrial sound and multimedia broadcasting because the transmission system for ISDB-T can be the same for such broadcasting systems, except for bandwidth.

Numerous efforts were made at the International Telecommunication Union’s Radiocommunications Sector (ITU-R) to standardize the ISDB-T system. This mainly involved the work of a Japanese delegation with a task group (TG11/3) that included the three C&C Prize recipients. Following standardization by the Advanced Television Systems Committee (ATSC) of the United States and the Digital Video Broadcast - Terrestrial (DVB-T) of the EU, ISDB-T gained approval as an international standard at ITU-R Radiocommunication Assembly 2000 in Istanbul.

Moreover, in 2000, Brazil gave high marks to the excellent performance of ISDB-T and to the flexibility of its system, such as its mobile reception capability and One-Seg functions. In June 2006, after long promotional campaigning by Japan, the United States, and Europe, Brazil decided to designate ISDB-T as the transmission system for DTTB. Subsequently, ISDB-T was accepted as the national DTTB system in many countries, including Argentina, Chile, Peru, Venezuela, the Philippines, etc.

Dr. Yamada fully applied himself to his work as the leader of ISDB-T system development from the early stages of its invention and development towards standardization and global deployment. Dr. Kuroda significantly contributed to the system at the development stage as the technological leader of the development team. In addition, Mr. Takada was a researcher from an early stage of development. His main contributions were standardization and domestic and global deployment of the ISDB-T system. Of course, Japan's DTTB would not have been successfully completed without the unified efforts and cooperation of members of the NHK Science & Technology Research Laboratories (STRL), as well as many other people, including those from manufacturers, government agencies, and technology councils. However, the C&C Prize recipients themselves truly showed outstanding leadership and played extremely important roles in developing and commercializing the ISDB-T system.

The NEC C&C Foundation thus highly praises Dr. Yamada, Dr. Kuroda, and Mr. Takada for their contributions to the advancement of the information technology industry through the research and development of the entire ISDB-T DTTB system.