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– Monthly community plaza in English for students, faculties and engineers –

Essay

Introduction of Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology

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The Applied Electromagnetic Research Institute has started its services with five laboratories since April 2011: Remote Sensing Fundamentals Laboratory, Radiowave Remote Sensing Laboratory, Space Weather and Environment Informatics Laboratory, Space-Time Standards Laboratory, and Electromagnetic Compatibility Laboratory. The planned subjects of these five laboratories encompass a vast range, from atomic to interplanetary space scales, and their mode of contribution to practical applications is widely diversified. While the institute as a whole has the common denominator called "electromagnetic wave measurement", the term has two connotations; that is, to measure electromagnetic waves and to measure something by utilizing electromagnetic waves.

Furthermore, the latter act of measuring something by using electromagnetic waves has the following two aspects: One is research on making good use of electromagnetic waves by fully understanding the characteristics of electromagnetic waves themselves. This requires the technology for generating and receiving electromagnetic waves and the knowledge about their propagation, scattering, and absorption, and thus it involves studies mainly with engineering aspects such as the development of radars and receivers. The other is the scientific study of subjects that are to be measured. If the subject is a weather phenomenon such as clouds or rain, it has the aspect of meteorology, and if it is a live body, it will have the aspect of biology. At this institute, I would like to create such an environment in which both engineering and scientific researchers will cooperatively endeavor to resolve problems and realize the best possible results. The following briefly describes the respective objectives of the five laboratories:

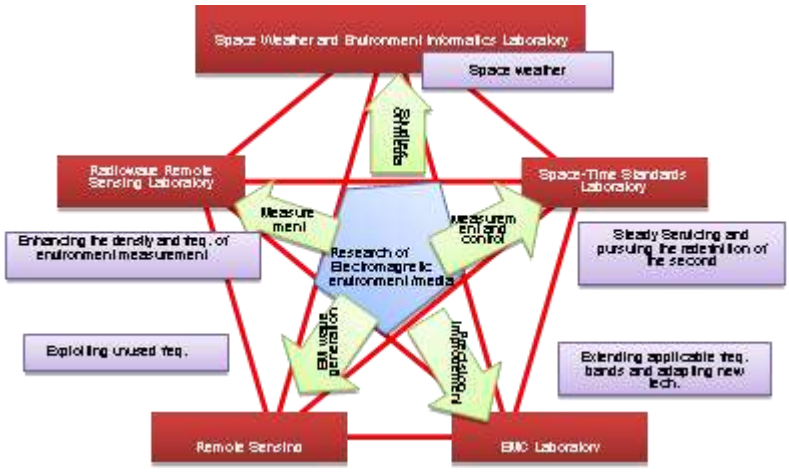

Fig.1 Fundamental scheme of Applied Electromagnetic Research Institute

Remote Sensing Fundamentals Laboratory

For the realization of high-precision global observation technology that determines the state of the atmosphere and makes the diagnosis of global environment changes such as global warming, the laboratory will work on the R&D of remote sensing technology for collecting data on the atmosphere composition and its circulation by using high frequency electromagnetic waves (optical, terahertz and millimeter waves).

Radiowave Remote Sensing Laboratory

The laboratory will establish leading-edge radar systems implementing technologies such as a next generation Doppler radar that enables determination of the 3D distribution of rainfalls in a short period of time and satellite-borne radars, and concurrently carry on the R&D on fundamental technologies of high performance and highly functional data-acquisition and processing based on the verification of the above-mentioned findings. The laboratory will also validate the performance of the high-resolution air-borne SAR (synthetic aperture radar) with a resolution of 30 cm in various applications, and concurrently carry on leading R&D activities such as velocity measuring technology for terrestrial as well as marine mobile objects toward the progressive development of observation methods.

Space Weather and Environment Informatics Laboratory

In the field of environmental information technologies in the human activity sphere including interplanetary space, the laboratory will integrate the observing/ sensing technologies and numerical computing technology into systems to be implemented mainly in Asian and Oceania areas for comprehensively performing the observation, collection, control, analysis, and distribution of international and various space and global environment data, and establish the informatics technology for processing the thus obtained large-volume data on the computer clouds.

Space-Time Standards Laboratory

Through the R&D of the Japan Standard Time generation and improving its distribution services as well as the R&D of the next generation space-time standards application technology, the laboratory will provide the nation with a reliable and precise space-time reference/time and frequency standard. It will also promote the R&D of optical frequency standards and the next generation space-time measuring technology, thereby contributing to the redefinition of the second and to the implementation of comprehensive space-time standards.

Electromagnetic Compatibility Laboratory

With further diversification and sophistication of radiowave applications as well as the rapid development of energy-saving equipment, the laboratory will promote R&D relevant to electro-magnetic compatibility measuring technologies in order to allow information and communications devices and communication systems to operate without being affected by electromagnetic wave interference and thus capable of being used

reassurance and safety with regard to human bodies. Moreover, the laboratory will conduct the test and calibration services of wireless devices, thereby contributing to the secure maintenance of the electromagnetic environment.

One activity which is being emphasized in the recent reorganization is the deployment or utilization of study results. The research subjects covered by this Institute are broadly diversified ranging from newly sprouted studies that have the potential of substantial growth in the future to those in a stage very close to practical applications. The type approval test service of the Electromagnetic Compatibility Laboratory, the generation and distribution of Japan Standard Time, and the frequency calibration service pertaining to the Space-Time Standards Laboratory as well as the space weather forecasting of the Space Weather and Environment Informatics Laboratory are actually operated as public services. On the other hand, the exploitation of the terahertz band that would be the last unused frequency band is indeed one of the subjects that are expected for future development. We will aggressively promote development for practical applications, thereby allowing this organization to be such an Institute that will carefully nurture each sprout to maturity and realize its potential of bearing fruit in the future.

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***Note**:* The strategy of research activities introduced by the author covers wide academic fields and it will impress researchers or scholars, especially in Asia Pacific region related to the activities. See it at *http://www.nict.go.jp/en/aeri/index.html*. Further, some activities are focused on the prevention of huge natural disasters and will be useful for them as well. Access *http://ictfss.nict.go.jp/* or *http://ictfss.nict.go.jp/yokohama2012/index.htm* for details.
(reported by IEICE-TFIPP, Kenzo Takahashi)

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Hot Topics

Special Lecture Was Given by Mr. Malcolm Johnson, ITU-T Director toward Evolving Collaborations between ITU and Academia

IEICE Standards Committee chaired by Prof.Tetsuya Miki, University of Electro-Communications, Tokyo, organized and successfully provided the special lecture by Mr.Malcolm Johnson, Director, Telecommunication Standardization Bureau (TSB) of International Telecommunication Union (ITU) under UN, briefly 'ITU-T', with the co-sponsorship of IEICE Communications Society, at IEICE Headquarters on March 13, 2012. It was moderated by Mr. Noriyuki Araki of NTT Access Network Service Systems Labs and inaugurated by Prof.Mitsuji Matsumoto, Waseda University who has served ITU-T Kaleidoscope Conference events as the Organizing Committee member. Mr.Johnson encouraged the attendees for the mutual better understanding between ITU and academia, including universities in Japan, through his lecture of the role and strategy of ITU-T and their current collaborative works with academia, represented by the Kaleidoscope Conferences, and relevant workshops, seminars, Webinars, lectures and Internship programs. He referred to ITU-T Kaleidoscope Conference held at Kyoto University in 2013 and solicited paper submission. He also mentioned, many universities in Asian region already joined ITU with the membership to know the global trend of ICT development in collaboration with standardization experts and the proposals from academia would evolve the international standardization plans of ICT. For details of ITU's policy and updated issues of collaborations with academia, see it at *http://www.itu.int/ITU-T/uni//*

(reported by IEICE-TFIPP, Kenzo Takahashi)

Fig.2 Mr.Malcolm Johnson, ITU-T giving a speech

Fig.3 Mr. Malcolm Johnson with the attendees

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Call for Papers in Time

TJMW2012- 2012 Thailand-Japan MicroWave, IEICE Electronics Society
Date of Conference: August 8-10, 2012
100 word Abstract submission deadline: June 1, 2012
Final manuscript submission deadline: June 15, 2012
Acceptance notification June 30, 2012
Contact: Dr.Tuptim Angkaew at *tuptim.a@chula.ac.th*

IWSEC2012- The 7th International Workshop on Security, IEICE Engineering Sciences Society
Date of Conference: November 7-9, 2012
Paper submission deadline: May 2, 2012
Notification of acceptance: June 6, 2012
Contact: Secretariat at *iwsec2012@inf.kyushu-u.ac.jp*

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Upcoming International Conferences

VTC2012-Spring in Yokohama- IEICE Communications Soc. & Engineering Sciences Soc., at Pacifico Yokohama in Yokohama, Japan, on May 6-9, 2012, *http://www.vtc2012spring.org/*

STF2012- IEICE Communications Soc., in Sarajevo, Bosnia and Herzegovina,on May 24-25, 2012, *http://www.iwwtf.com/.*

COIN2012- IEICE Communications Soc., in Yokohama, Japan, on May 29-31, 2012, *http://www.ieice.org/~COIN2012/*

ISOME2012- IEICE Electronics Soc., at NTT Musashino Research Center, Musashino, Tokyo, Japan, on June 7-8, 2012, *http://www.ieice.org/eng/s_issue/cfp/2013_3EC_2.pdf.*

ITC-CSCC2012- IEICE Engineering Sciences Soc., in Sapporo, Japan, on July 15-18, 2012, *http://www.knt.co.jp/ec/2012/itc-cscc/*

TJMW2012- IEICE Electronics Soc., in Bangkok, Thailand, on August 8-10, 2012, *http://www-ap.apsci.yamaguchi-u.ac.jp/TJMW2012/TJMW2012/Home.html*

APCC2012- IEICE Communications Soc., in Jeju Island, Korea, during October 15-17, 2012, *http://apcc2012.org/main/*.

ISITA2012- IEICE Electronics Soc., in Hawaii, USA, on October 28-31, 2012, *http://www.isita.ieice.org/2012/*

ISAP2012- IEICE Communications Soc., in Nagoya, Japan, on October 29-November 2, 2012, *http://www.isap12.org/*

APSITT2012- IEICE Communications Soc., in Santiago and Valparaíso, Republic of Chile, on November 5-9, 2012, *http://www.ieice.org/cs/in/APSITT/2012.*

IWSEC2012- IEICE Engineering Sciences Soc., in Fukuoka, Japan, on November 7-9, 2012, *http://www.iwsec.org/2012/*

ICPR2012- IEICE Information Systems Soc., in Tsukuba, Japan, on November 11-15, 2012, *http://www.icpr2012.org/*

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Message from TFIPP Secretariat

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