IEICE Global Plaza

Essay

International Collaboration on Advanced Mathematical Tools for Frontier Astronomy

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During the last two decades, many important new telescope facilities have been installed in northern Chile, among them, Gemini-South, SOAR (AURA/NOAO-USA) and VLT Paranal (ESO). Together with the extensive existing facilities, these have created a unique astronomy infrastructure which has triggered the planning and construction of a wide range of major next-generation optical and radio astronomy facilities. Prominent among these latest projects are the ALMA (Atacama Large Millimeter Array) Observatory (currently under construction by ESO, AURA and NAOJ) and the LSST (Large Synoptic Survey Telescope) Project (currently under design and planning by AURA), which will bring a new frontier of technology requirements for data flow management in the coming decade. In fact, the sensing, transmission, process, analysis, storage and archiving of tera- and peta-range volumes of data that these new facilities will need require a robust set of interdisciplinary skills and this seems the right moment to develop them.

Given these circumstances, the Center for Mathematical Modeling (CMM) of the University of Chile, AURA and ALMA recently organized (with the sponsorship of Chile's National Science & Technology, CONICYT-CHILE) a special topical meeting in southern Chile's lake district, the *Pucón Symposium 2009*, offering a unique opportunity to address and discuss many of the relevant technical and business issues behind the emerging "*Advanced Mathematical Tools for Frontier Astronomy*". The main intention was to bring together key people from various engineering, technical and scientific disciplines from different R&D organizations with an established tradition of international collaboration, in a special academic and scenic environment, where they could analyze in depth their current activities and discuss in detail their possible future initiatives.

Within that context, the Pucón Symposium 2009, turned out to be a most successful conference focused on the advanced mathematical tools as well as the engineering and technological aspects involved in frontier optical and radio astronomy, including ultra-high speed networking, e-science/grids/high performance computing, data storage/processing/archiving, data imaging, robotic telescopes, data mining, search engines, time series and automatic classification, virtual observatories, remote astronomy and optimal scheduling.

Furthermore, the Symposium's technical program drew the attention of researchers in other areas specially relevant in Chile beside astronomy, such as mining, natural resources and biosciences. All of them benefited from the two-day discussions held in the sessions on: Science with Massive and Time-varying Datasets (what science is being done now? what can be done in the future?); Next-Generation Search Engines and Time Series Datasets (how do we find what we are looking for?); Anomaly Detection (how do we find and what we do with the "oddballs"); Visualizing High Dimensional and Massive Datasets (how do we or will we visualize what we find?); Frontier Statistics and Computational Mathematics for Massive Datasets (what statistical and computational tools we have now? what will we need in the future?); Network Infrastructure and Large Computational Facilities for Massive Datasets (what technology exists and what is lacking?); ALMA and LSST Requirements and Challenges (how will astronomical research be affected by ALMA and LSST?). Undoubtedly, all these issues will be critical to a number of other scientific and technological areas as their experts also begin to deal with massive datasets.

Urgent information

Just on the printing process of his article, the big earthquake hit his mother country. All the members of TFIPP here express our heartfelt condolences to the people who had damage in the disaster.

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Note from IEICE-TFIPP

Prof. E.S. Vera is a world class scientist conducting research activities of ICT in collaboration with international academic institutions. He is currently Executive Manager for I&D at CMM as well as Adjunct Professor at the School of Engineering and Sciences in University of Chile. After his activities in USA and Japan, he returned to Chile in 1995 and served as Director of the "AccessNova Program", a joint project for broadband network applications development related to ALMA/LSST, led by the University of Chile and NTT. He has been a technical consultant for R&D to Codelco-Chile since 2001 and to NTT Hqts since 2006. He has also served The University of Tokyo, as a visiting professor in 2005-2006, and NTT Labs (Musashino), as a visiting scientist throughout the last two decades. This article was kindly contributed to the request of IEICE-TFIPP to encourage international collaborative R&D.

For details of ALMA/LSST, retrieve them at the URLs:
http://www.almaobservatory.org for ALMA, and
http://www.lsst.org/News/site_selection.shtml for LSST.

Useful Remarks

Invitation to Workshop on Circuits and Systems in Karuizawa

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Secretary, System and Signal Processing Subsociety, IEICE Engineering Sciences Society

"Karuizawa Workshop on Circuits and Systems" is one of IEICE workshops organized by IEICE Engineering Sciences Society and it has been held every Spring season since 1988. Since IEICE Global Plaza no.2 and no.3.introduced the academic activities of the Society, you would easily catch the role of the Subsociety and the reason why the Society tries to promote the workshop.

The workshop held this year corresponds to the 23rd. The scale of the workshop has been extended due to the demand of the participants so far. It reaches more 100 paper presentations and more 200 participants now. For your convenience, the attractive aspects of the workshop are introduced here, from the viewpoint of its history and scale as following.

First of all, the most important aspect of the workshop is that it covers wide area of different research fields. For example, the representative topics are non-linear analysis and implementation issues, numerical operational analysis of cir-

cuits, analog circuits which are still indispensable, digital signal processing, VLSI design technologies, theories on discrete systems, furthermore interdisciplinary issues covering different special fields and the exploratory works of future research topics are also discussed. The workshop also is planned to provide special sessions on some interesting updated themes every year, you can join it to look over hot topics in your relevant fields.

The second aspect of interest is for the workshop to encourage younger generation. This workshop is based on the planning and management activities by younger generation members who belong to anyone of the four Technical Committees under System and Signal Processing Subsociety, namely ones on Circuits and Systems, VLSI Design Technologies, Signal Processing and Concurrent System Technologies, and/or Technical Committee on Non-linear Problems under the Non-linear Theory and Its Applications Subsociety. As a matter of fact, the planning and management activities of workshops are very effective to educate the younger generation. Also reviewing papers and recommendation works for Young Researchers Award efficiently encourage them.

The third aspect of interest is the attractive environment of the venue where the workshop will be held. The Karuizawa covering the venue is one of the representative resorts in Japan. The venue has cottages where multiple participants can share, and they can continue discussions or increase friendship there without worrying about time. Many participants tend to join the workshop with expectation to have a good time there.

Your paper submission or presentation in English is most welcome in the Circuits and Systems Karuizawa Workshop. Especially, we are looking forward to the participation of overseas members or foreign students studying in Japan.

The coming Workshop will be summarized as following.
Title : The 23rd Workshop on Circuits and Systems in Karuizawa
Date : 19 and 20 April 2010
Venue : Karuizawa Prince Hotel West, International Conference Hall "Asama"
Keynote Speeches: Complexity Modelling and Its Applications by Prof.Kazuyuki Aihara, Aihara Complexity Modelling Project, University of Tokyo
Invited Speeches: by 15 outstanding researchers

Hot Topics
Language-Barrier Free Cyberspace (LFCS) for easier communication between IEICE members and IEICE
IEICE Task Force for International Policy and Planning (IEICE-TFIPP)

The Task Force has discussed and drafted how to globalize the activities or organization of IEICE to enhance the quality of member services, especially for overseas members, so far since the middle of 2008. One of the outputs is the realtime worldwide delivery of IEICE Global Plaza to support and encourage overseas members or students/researchers for their academic activities. As another program, the Task Force has planned to set up the LFCS and empirically test it through cooperative work with IEICE Overseas Sections or international leading people, in coming IEICE fiscal year.
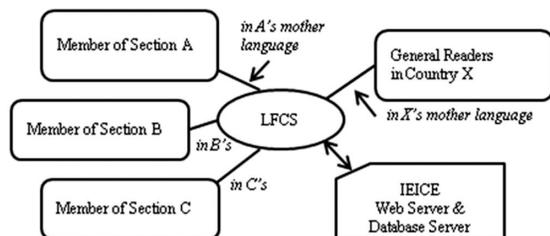

Fig.1 Concept of LFCS (Members can access IEICE servers or retrieve required information in each native language over LFCS)

Fig.1 shows the concept of LFCS. Members or general readers of IEICE Journal/Web site can share the information which IEICE uploaded in Japanese or English, in their native languages on demand by selecting the corresponding Icon and simultaneously access IEICE servers for information retrieval, subscription, application and registration and so on. The system will be based on the multi-lingual infrastructure on the Internet for inter-cultural collaboration, "Language Grid" developed by National Institute of Information and Communications Technology. The details of system, available languages, test procedures will be introduced in coming issues.

International Conference Calendar in 2010
IMQA 2010 (IEICE Engineering Sciences Soc.)
The 4th International Workshop on Image Media Quality and its Applications, at Tokyo in Japan, on May 13-14, *http://www.imqa.jp/IMQA2010/*.
ISOME 2010 (IEICE Electronics Soc.)
The 6th International Symposium on Organic Molecular Electronics, at Chiba in Japan, on June 10-11, *http://www.ieice.org/˜ome/ISOME/Welcome.html/*.
APSITT 2010 (IEICE Communications Soc.)
The 8th Asia-Pacific Symposium on Information and Telecommunication Technologies, at Kuching in Malaysia, on June 15-18, *http://www.ieice.org/cs/in/APSITT/2010/*.
OECC 2010 (IEICE Communications Soc. & Electronics Soc.)
The 15th OptoElectronics and Communications Conference, at Sapporo in Japan, on July 5-9, *http://www.oecc2010.org/*.
NOLTA 2010 (IEICE Engineering Sciences Soc.)
2010 International Symposium on Non-linear Theory and Its Applications, at Krakow in Poland, on Sept. 5-8, *http://nolta10.is.tokushima-u.ac.jp/*.
SISA 2010 (IEICE Engineering Sciences Soc.)
2010 International Workshop on Smart Info-Media Systems in Asia, at Manila in Philippines, on Sept. 8-9, *http://splab.cs.kitami-it.ac.jp/sisa2010/*.
GJS2010 (IEICE Communications Soc.)
The 13th German Japanese Symposium, at Osaka in Japan, on Sept. 13-14, *http://www.ieice.org/cs/conf/calendar.html*.
ICCE 2010 (IEICE Electronics Soc.& Communications Soc.)
The 3rd International Conference on Communications and Electronics, at Nha Trang in Vietnam, on Aug. 11-13, *http://www.hut-icce.org/2010/*.
AP-RASC'10 (IEICE)
2010 Asia Pacific Radio Science Conference, at Toyama in Japan, on Sept. 22-25, *http://www.ap.ide.titech.ac.jp/ap-rasc10/*.
IWSEC 2010 (IEICE Engineering Sciences Soc.)
2010 International Workshop on Security, at Kobe in Japan, on Nov. 22-24, *http://www.iwsec.org/2010/*
APARM 2010 (IEICE Engineering Sciences Soc.)
The 4th Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling, at Wellington in New Zealand, on Dec. 2-4, *http://msor.victoria.ac.nz/Events/APARM2010/*.

Message from TFIPP Secretariat
This issue is delivered also by a free mail magazine "IEICE Global Plaza on Line" with updated news of interest for you. Please contact Prof.Takahashi, TFIPP at global @ieice.org, if you need. Back numbers are available in archives at *http://www.ieice.org/eng/global_plaza/index.html/*.