Global Communications Newsletter

April 2002

How to Promote IEEE Activity in Countries with Economic Crises

By Yuri Poplavko, Ukraine

IEEE policy is quite open, and Societies try to support engineers and scientists in countries that are faced now with permanent and deep economic crises. However, it is not very easy to overcome "cool relations" toward Western support from the old generation of Eastern colleagues, as well as the financial difficulties of young scientists and engineers in post-communist countries. The main problem is that science and engineering have sunk in young people's self-esteem due to heavy layoffs during times of crisis.

It is well known that the new post-Soviet republics possess high potential in science due to well established education. Science was previously one of the most prestigious fields of human activities, so many gifted and active persons willingly aspired to this area. That is why, up to now, our mathematics, physicists, and programmers are desired in Europe and the United States.

Top positions in Soviet society were held by active people who could not realize themselves without having high posts in the Communist party. Even at the present time, being over middle-aged, those people are at the head of the most important scientific, education, and production fields. They distrust the West due to the history of mistrust. The point is that engineers and scientists of such a large and powerful country (as Soviet Union was) were perfectly separated from the Western countries for more than 70 years. It was impossible for most of them to visit conferences abroad.

Hardware and software developments in the area of electronics and communications were considered a big secret. This was the basis of the work of Eastern scientists and engineers when elaborating on their own original methods in telecommunications and electronics, which might be a good foundation even now. On the other hand, information about Western decisions was rather difficult to obtain in Soviet countries, and this motive now leads to collaboration as well.

Russia is now in better standing, but in Ukraine, until now universities could not buy scientific books and journals, and access to the Internet is quite limited and difficult. There are still problems with English language education and computer purchasing, especially for students. That is why talented young people try to migrate to another countries, and it looks like they are not in a hurry to return. They cannot find prosperity in their country with extremely low salaries and the absence of rapid raises; this situation destroys any hope for success.

In Ukraine, the extremely low salaries for scientists and engineers restrict the possibility of paying membership dues and journal subscriptions. Moreover, most engineers have no clear idea of IEEE potentialities. We need to find a way out of the impasse. First of all, IEEE might use some limited possibilities to support Eastern engineers and scientists to take part in IEEE Societies. It is obvious that this support should be given first of all to young people. Second, it is necessary to provide large-scale information about IEEE potentials.

In other words, IEEE Societies should demonstrate their friendly and open policy to Eastern scientists and engineers, including:

- Limited free memberships
- Limited free subscriptions to journals
- Partial support to attend scientific conferences
- Partial support to Ph.D. students to participate in conferences
- A competition and award for best Ph.D. students, best publications, and so on
- Promotion of some deserving people to Senior membership and so on

It looks like the Ukrainian Chapter's experience proves the above-mentioned proposals.

IEEE Communications Society started in Ukraine in 2001 from free membership support. Six new young members (aged up to 30 years) have joined the Central Ukrainian Chapter since January 2001. They represent six different scientific and education centers in three Ukrainian towns (Kiev, Donetsk, and Sevastopol). All these new ComSoc members have gotten free subscriptions to the main ComSoc journals. They share these journals and current information about ComSoc events with their colleagues, which strongly works in favor of the Society. Members of the Central Ukraine Chapter are supported by periodical IEEE additions. Some of those journals are passed to the Libraries (e.g., libraries of National Ukrainian University and National Technical University of Ukraine).

This year the Central Ukraine Chapter realized a Project proposed by Prof. Trevor Clarkson: ComSoc supported five Ukrainian Ph.D. students' participation in the Ukrainian annual International Conference Microwave & Telecommunication Technology, CriMiCo 2001. Each of these Ph.D. students received support of $200. In Ukraine, this money is quite enough to pay for a student's registration fee, and to participate in a conference in another town. Moreover, at the first plenary meeting of CriMiCo 2001, we had a chance to tell the audience about ComSoc policy and advantages, as well as to offer those five persons as consultants on how to join IEEE ComSoc.

By the way, the annual CriMiCo conference is located in Sevastopol, South Ukraine, Crimea (a peninsula in the Black Sea), and is held each September. At CriMiCo 2001, September 12–14, 2001, we had 240 reports from 12 countries. It makes sense to arrange continued support for this Conference from ComSoc.

Center Ukraine Chapter proposals are:

- Make an annual rotation of free membership, thus using ComSoc support more effectively.
- Sponsor Ukrainian Conferences and Seminars such as

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A Report on the Satellite and Space Communications Technical Committee Activities

By Iwao Sasase, Japan

New and revolutionary developments continue to take place in the field of satellite and space communications. The goal of the Satellite and Space Communications Technical Committee (SSC TC) is to be actively on top of these new developments, ensure that they are made visible to the IEEE Communications Society (ComSoc) community, and provide a forum to facilitate technical interchange among those working in the field. Toward this objective, we are in the process of formulating plans to attract new members, particularly from the industries and organizations at the forefront of these new developments. Currently the SSC TC has over 110 members from academia and industry. The SSC TC meeting is held semi-annually at ICC and GLOBECOM. The SSC officers are Iwao Sasase, Chair, Ron P. Smith, Vice Chair, and Abbas Jamalipour, Secretary.

The *SSC Newsletter* is published twice a year and distributed at ICC and GLOBECOM, and also electronically at the SSC Web site. Secretary Abbas Jamalipour is serving as Editor and working actively to improve the contents of the *SSC Newsletter* and SSC Homepage. At our website (http://www.comsoc.org/socstr/techcom/ssc), you can get a lot of useful information on SSC TC activities including SSC Charter, Overview, Newsletter, Meeting Minutes, Operating Procedure, SSC Membership, SSC Reviewers, TC Survey, Call for Papers, events, and upcoming meetings, and interact with the Committee. The SSC TC established a new SSC TC Award, the Distinguished Contributions to Satellite Communications Award, which was approved at the SSC TC meeting in June 2001. This award aims to promote research and development activities in the area of satellite communications within the industry and academia research community. An individual researcher or a team of researchers may be nominated or may apply, who have research related to the field of satellite and space communication with a good track record in research, and have made a significant contribution in the field in the form of one or more of the following: Publication of one book, or one book chapter, or one journal paper, or one international conference paper in the field of satellite communications during the year immediately prior to the award year.

The SSC TC has sponsored many technical sessions, tutorials, and workshops on satellite and space communications at ICC, GLOBECOM, MILCOM, and other major IEEE conferences. At ICC 2001, SSC TC sponsored two sessions and one tutorial on "Mobile and Wireless Internet — Protocols and Services." At GLOBECOM 2001, the SSC TC organized a symposium on "Future Satellite Communications for Global IP and ATM Networking." Abbas Jamalipour was Chair of the symposium, which featured a panel discussion on "Market Trends and Technical Developments for DVB-RCS" and featured "Global Standardization and Regulatory Effort for Broadband Satellite Communications." In the panel session, implementations, equipment development, technology enhancements, and market trends for the new ETSI two-way satellite standard DVB-RCS were considered. One tutorial on "Broadband Satellite Communications Based on TCP/IP, MPEG/DVD, and ATM" given by Erich Lutz, and one workshop on "Mobile over 3G and Beyond Wireless networks" organized by Secretary Abbas Jamalipour were held. The SSC TC organized three regular technical sessions on "Networking Protocols for Satellite Communications," "Mobility and Traffic Management in Satellite Networks," and "Broadband and Multimedia Satellite Networks."

For ICC 2002 (April 28–May 2, New York), a symposium on "Satellite Communications" is being organized. Chair Iwao Sasase serves as symposium chair (http://www.katayama.nuee.nagoyau.ac.jp/~yamazato/ICC2002SSC). For GLOBECOM 2002 (Nov. 17–21, Taiwan), two symposia on "Satellite Communications — Systems Architectures, Protocols and Services" are being organized. The SSC TC will organize a symposium on satellite communications regularly to provide an active forum for researchers and engineers to exchange new ideas in technical paper presentations and panel discussions. The symposium also intends to bring together various satellite network systems developers to discuss the current status, technical challenges, standards, fundamental issues, and future services and applications in the form of workshops and tutorials.

The SSC TC has also been actively promoting satellite communications systems and technology via professional journals, transactions, and magazine publications. Advisor Desmond Taylor continues to serve as a Senior Editor of *IEEE Journal on Selected Areas in Communications*. Member Michel Bousquet serves on the editorial panel of *International Journal of Satellite Communications*. Member Marie-Jose Montpetit and Chair Iwao Sasase serve as area editors in radio and satellite communications for *IEEE Communications Surveys and Tutorials*. Because of the broad range of technologies involved and the necessity of integrating and interfacing satellite communications with other networks, the committee has attempted to develop liaisons with other technical committees such as Multimedia Communications, Personal Communications (PC), and CSIM. Vice Chair Ron P. Smith is working actively to strengthen the relationship with the American Institute of Aeronautics and Astronautics (AIAA). Chair Iwao Sasase is also working actively to strengthen the relationship with Institute of Electronics, Information and Communication Engineers (IEICE) of Japan Technical Groups on Communications Systems and Satellite Telecommunication as well as the Korean Society of Space Technology. In October, Chair Iwao Sasase made the keynote speech on "Technical Activities of IEEE ComSoc Satellite and Space Communications Technical Committee and Asia Pacific Board" at the 2001 Joint Conference on Satellite Communications (JC-SAT) held in Kyoto, Japan. JC-SAT 2001 was jointly organized by the Satellite Telecommunication Technical Group of IEICE and the Korean Society of Space Technology. The Organizing Chair was member Hideki Mizuno and Vice Chair was Dr. Kim Kwang-Young; there were more than 120 participants.

The SSC TC continues to provide a forum to facilitate technical interchange among those working in the field. The current emphases are on the evolution of new satellite and space-based systems and on the applications of emerging technologies to satellite and space communications. With the development of digital technologies, satellites have emerged at the forefront of multimedia delivery techniques. The ability to deliver high performance and cost-effective broadband satellite network solutions is essential to the growth of e-business in emerging markets. Satellite networking is now a well established solution for global interconnectivity. Satellite will have a major role in providing global interconnectivity for the next-generation wireless networks, where IP and high-speed broadband applications are the dominant services.

Clearly, the field of satellite communications continues to grow rapidly, and remains interesting and exciting. We encourage all who are interested in this field to join our committee. Visit our website (http://www.comsoc.org/socstr/techcom/ssc) where you can get much useful information on SSC TC activities.

Eduard Rhein Foundation (ERF) Celebrates 25th Anniversary at Awards Ceremony, Munich 2001

By Horst Bessai, Vice President – Membership Services, IEEE Communications Society

At an October 20, 2001 ceremony, Bavarian State Minister of Education Monika Hohlmeier presented the Basic Research Award of the Eduard Rhein Foundation to Prof. David Payne, University of Southampton, United Kingdom. David Payne received the highly prestigious prize in recognition of his work that led to:

"The invention of erbium-doped fiber amplifiers (EDFAs) which enabled the revolution of global telecommunication networks during the last decade."

The ceremony, which also marked the Foundation's 25th anniversary, took place at the Ehrensaal (Hall of Fame) of the Deutsche Museum (German Museum of Science and Technology), Munich, Germany. Among the 200 invited guests were representatives from universities, research institutions, electronics industries, and both national and international governments. ERF's Basic Research Award is the highest-ranking European research award in information technology. It consists of a bronze medal, certificate, and cash honorarium of 100,000 deutsche marks. Likewise, ERF's Technology Award comes with the same honorarium. It was established to honor outstanding technological achievements.

The 2001 Technology Award was presented to Prof. José Luis Moreira da Encarnação, Technical University of Darmstadt, Germany, "for the conception, development, and successful implementation of open graphics standards applied to multimedia and virtual reality designs."

Since June 1999, our Society has had an Agreement of Affiliation with the Eduard Rhein Foundation. IEEE ComSoc is entitled to submit nominations of appropriate and qualified candidates for ERF's awards programs. Our Society is actively represented by a voting member on ERF's Scientific Advisory Board (Board of Curators). Conversely, ERF is entitled to nominate a delegate to ComSoc's Awards Committee.

Prof. David Payne (left) receives the 2001 Eduard Rhein Basic Research Award presented by Bavarian State Minister of Education Monika Hohlmeier (right), with ERF Managing Chairman, Dr. Rolf Gartz (center), in attendance.

The Foundation, named after the late Eduard Rhein (1900–1993), an inventor, author of many nonfiction books, and Editor-in-Chief of a German weekly magazine, currently has assets of 18 million deutsche marks and confers annual awards averaging 300,000 deutsche marks. Previous awardees include, to name just a few, Claude Shannon, Andrew Viterbi, and Richard Hamming, as well as many other well-known experts in our field.

Report on EUROCON 2001 International Conference on Trends in Communications

By H. N. Bali, United Kingdom

IEEE Region 8 EUROCON 2001 International Conference on Trends in Communications was held 5–7 July, 2001 in Bratislava, Slovakia. This conference was organized by IEEE Region 8, Murgas association for support of IEEE activities in Slovakia, IEEE Czechoslovakia Section, Slovak University of Technology in Bratislava, and Kingston University in England. Reviving EUROCON 2001 was an attempt to establish a third IEEE Region 8 conference behind MELECON and AFRICON.

The recent changes in Central and Eastern Europe, in the political as well as technological domains, have made communications technology and telecommunications infrastructure the main driving forces of rapid economic and social development. The aim of organizers was to bring up professional discussions of technical themes on current issues and trends to provide the educational platform and to ensure dissemination of new knowledge to all participants.

During the conference 146 papers were presented in 25 sections. The main keynote addresses were presented by Prof. Richard Blahut, "Communications in Space and Time," and Prof. Ramjee Prasad, "Personal Area Networks." A series of free tutorials were organized during the conference for the delegates. These included "Third Generation Wireless Standards, Algorithms and Future Solutions: Burst-by-Burst Adaptive Multimedia Transceivers" by Prof. Lajos Hanzo, "Introduction to Software Defined Radio" by Prof. Bahram Honary, "Third Generation Mobile Communication: UMTS/IMT-2000" by Prof. Ramjee Prasad, and "New Media in Education" by Prof. Baldomir Zajc. Free workshops were also included, which took place on 5 July for registered participants. Prof. Baldomir Zajc also organized a live videoconference, which took place between the venue of the conference, the University of Carlos III, Madrid, Spain, the University of Ljubljana Slovenia, and Philips, Eindhoven, The Netherlands, titled "Video and Image Processing for Personalized Applications." On 4 July two parallel workshops were organized in the morning on Project Management and Leadership Skills presented by Margaretha A. Eriksson, Sweden, and Kurt Richter, TU Graz, Austria.

The IEEE Region 8 Student paper contest was held on 6 July in the morning to show the quality of the contributions by students, and the winners were announced during Gala evening. After the conference, on 8 and 9 July an Accreditation workshop was organized, which dealt with accreditation issues of university engineering programs to reflect the importance of accreditation within the European countries to allow greater mobility to students and staff in technical faculties across Europe.

An interesting and varied program of social activities was

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ITU-R Approves Two Recommendations on Satellite Systems Offering Multiple Services (SSOMS)

By Michele Luglio and Giuseppe Quaglione, Italy

In recent years several new satellite systems have been proposed and are being implemented to exploit both fixed and mobile interactive multimedia and personal services operating in the Ka frequency band (20–30 GHz). These systems are taking advantage of the invaluable experience gained with many years of in-orbit operation of NASA's Advanced Communications Technology Satellite (ACTS) program and the Italian ITALSAT satellites. An important issue raised by these systems is to investigate to what extent fixed and mobile satellite services can share the same frequency bands, what the technical implications are, and which techniques can facilitate such frequency sharing.

In this context, during the last study period, the International Telecommunication Union — Radiocommunication Standardization Sector (ITU-R) has adopted two important Recommendations. They are related to the technical characteristics and sharing scenarios of systems in the fixed satellite service (FSS) and mobile satellite service (MSS) using the same frequency bands in the range from about 20 GHz to about 50 GHz. These Recommendations have been developed thanks to essential contributions from the Italian delegation, namely from the University of Rome "Tor Vergata," Telespazio, and Alenia Aerospazio. They have been members of the team of the Satellite EHF Communications for Multimedia Mobile Services (SECOMS) project, sponsored by the European Commission in the framework of the Advanced Communications Technologies and Services (ACTS) program.

ITU-R Recommendation S.1329 has been developed within Study Group 4 of ITU-R and deals with frequency sharing of the bands 19.7–20.2 GHz and 29.5–30.0 GHz between systems in the MSS and the FSS. This Recommendation gives interference protection criteria both for CDMA and FDMA carriers. It concludes that, while for FSS networks it is feasible to achieve minimum satellite spacing in the geostationary orbit of 2° with 0.7 m earth station antennas and uplink antenna beamwidths equal to or smaller than 1°, MSS networks as originally studied, with downlink earth station antenna beamwidth of about 10°, would require more than 2° spacing from the nearest geostationary FSS (cofrequency, cocoverage) in order to provide the necessary protection to the MSS carriers.

ITU-R Recommendation M.1468 has been developed within Study Group 8 of ITU-R and gives general technical characteristics of some SSOMS to be taken into account in developing frequency sharing scenarios between FSS and MSS. In particular, system architectures of NASA's personal access satellite system of the ACTS program and the European SECOMS project are described. Furthermore, it is recommended to implement techniques to facilitate frequency sharing such as CDMA, low side-lobe antenna patterns orthogonal to the geostationary orbit, advanced technology for pointing, acquisition, and tracking (PAT) of user terminals that allow an overall expected pointing accuracy better than 1°, and extensive use of concatenated coding (Reed Solomon + convolutional) that allow a reduction in the power flux density at the geostationary orbit and at the Earth's surface of more than 6 dB.

The conclusions of these Recommendations are of significant importance for the future design of SSOMS networks in the Ka or even V (40–50 GHz) frequency bands. In fact, they provide useful guidelines on the techniques to be used to facilitate frequency sharing between FSS and MSS and on the expected performance in the effective use of the geostationary orbit.

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Report on EUROCON 2001/*(Cont'd from page 3)*

included to provide opportunities to the delegates for social intercourse and to experience some of the cultural offerings of Bratislava. On 5 July a concert in Primas palace in Old City was visited. On 6 July a gala banquet was held, and afterwards the prizes were presented. The presentation of the Technik ensemble, the mime of Milan Sladek, and a local band, which was highly appreciated by the delegates, made welcome contributions to the atmosphere of the evening.

Events were also organized for accompanying partners of the delegates to visit the local attractions.

IN view of the success of EUROCON 2001, the organizers feel that this should be continued biennially. It is envisaged that the next conference could be combined with ERK in Lujblujana to join the technical activities of the two professional societies within Region 8 for mutual cooperation and benefit.

Promoting IEEE Activity/*(Cont'd from page 1)*

CriMiCo. If this conference is provided under the aegis of ComSoc, it will interest many more scientists and engineers in participating in this Society.

- Organize two or three new ComSoc Chapters in Ukraine, a country with a population of 50 million, long standing traditions in science and education, and large marketplace for communication equipment. Except Central Ukraine (Kiev), it would be efficient to open a South Ukraine Chapter in Odessa and an East Ukraine Chapter in Kharkov. We need to find ambitious volunteers to chair these divisions.