



# IEEE NEWSLETTER

## KITCHENER - WATERLOO SECTION



April 1994

### Section Officers

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Vice Chair: Rafaat Mansour, (519)622-2300 ext. 246  
Secretary: Rosalind Hood-Morris, (519)570-0300  
Treasurer: John Mowbray, (519)884-1710 ext. 371, 569

### Chapter Chairs

Computers: Manh Le, (519)884-1710  
Antennas and Prop., Microwave Theory and Tech.:\* Len Chow, (519)885-1211 ext. 2822  
Circuits and Systems, Electron Devices:\* C.R. Selvakumar, (519)885-1211 ext. 3978  
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### Committee Chairs

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(News Letter): C.R. Selvakumar (519)885-1211 ext. 3978  
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The Kitchener-Waterloo Section of the Institute of Electrical and Electronics Engineers serves all members whose mailing address is in Bruce, Grey, Perth, Waterloo or Wellington Counties.



## **FERDO IVANEK ON MICROWAVE RADIO COMMUNICATIONS**

Presented by the Antennas and Propagation/ Microwave Theory and Techniques Chapter.

Time: Friday May 13th 1994, 4:45 p.m.

Place: COMDEV Ltd, 155 Sheldon Drive, Cambridge. Ont.

Speaker: Dr. Ferdo Ivanek, Communications Research Company, Palo Alto.

Subject: Progress and Change in Microwave Radio Communications

Speaker: Dr. Ferdo Ivanek heads the Communications Research Company in Palo Alto. He is an MTT Society Distinguished Lecturer. This lecture is the result of a research project undertaken for the IEEE.

Subject: Terrestrial and satellite based radio communications continue to represent the major commercial microwave market segment worldwide. Application variety is increasing as a consequence of technological progress, on the one hand, and the growing diversification and deregulation of communications services, on the other. Vehicular and pedestrian mobile radio services and their derivatives, e.g. wireless PBX, LAN and local loop, represent the next major microwave application area and are therefore of vital interest to MTT-S.

The introductory part of the lecture deals with the relevant communications trends and standardization progress, because sound business and technical decision making relies on a good understanding of these matters. The main part of the lecture concentrates on hardware development trends, with emphasis on MMICs for hand-held terminals. The impact of "consumerization" on the microwave industry is addressed.

## **HIROSHI IWAI ON SUB-MICRON CMOS METHODOLOGY**

Time: Monday May 16th 1994, 10:30 a.m.

Place: University of Waterloo, Davis Centre Conference Room (Library)

Speaker: Dr. Hiroshi Iwai, Toshiba, Japan.

Subject: CMOS Scaling below 0.1 micron.

## **VIDEOCONFERENCE ON HUMAN/COMPUTER INTERACTION**

The IEEE in conjunction with Rogers Cable is broadcasting a videoconference on "Revolutionary Concepts in Human/Computer Interaction", preceded by a short presentation on IEEE activities in 1993 and plans for the future.

Time: Wednesday May 18th 1994  
IEEE report 11.40 am - 12.00 noon EDT  
Human/Computer Interaction 12.00 noon - 3.00 pm EDT

The program will be broadcast on local cable channel 41.

Cost: Documentation which supplements the show will be available for a fee, tentatively set at \$10.00 per copy.

For further information, watch the Rogers Cable Bulletin Board, and/or contact Rosalind Hood-Morris at 886-4571 or Tom East at 746-7809.

## **TOM LEE OF MAPLE SOFTWARE ON MATHEMATICAL COMPUTING FOR ELECTRICAL ENGINEERS**

Time: Thursday May 26th 1994., 5:30 p.m.

Place: University of Waterloo, Davis Centre Room 1304.

Speaker: Tom Lee, Waterloo Maple Software.

Subject: New Dimensions for Mathematical Computing for Electrical Engineers.

Refreshments will be served at 5:00 p.m.

Speaker: Tom Lee is Business Development Manager in the Strategic Alliances Division of Waterloo Maple Software. He holds a BAsC and MASc in Systems Design Engineering at the University of Waterloo. He is also a part-time PhD candidate in Mechanical Engineering at Waterloo. His technical interests include symbolic engineering computation, system modelling and simulation, and computer aided design. At Waterloo Maple Software, he is responsible for developing strategic partnerships between Waterloo Maple Software and leading engineering software manufacturers.

Subject: Maple V and Theorist are symbolic mathematical computation products produced by Waterloo Maple Software. Both products have the ability to manipulate and solve mathematical problems encountered in many disciplines of engineering, analytically. Engineering users have found this symbolic capability to be invaluable in analyzing and designing systems and circuits. Mathematical functions include calculus, linear algebra, non-linear equation solving, transforms, and statistics. The product Maple V is available both as a stand-alone interactive application, as well as a linkable general-purpose math server to be called from custom applications.

## **ANNUAL GENERAL MEETING KITCHENER-WATERLOO SECTION IEEE**

Date: Monday May 30th 1994

Time: 5.30 p.m.

Place: University of Waterloo, Davis Centre Room 1304.

1. ANNUAL GENERAL MEETING - K-W-SECTION, IEEE. The Nominating Committee (chairman Robert MacPhie) has proposed a slate of names to serve on the K-W Section's Executive Committee from July 1, 1994 to June 30, 1995. The names of the individuals are listed below.

Members may nominate other members as alternative candidates under the following conditions:

For each nominee

- a) obtain agreement in writing to stand,
- b) obtain supporting signatures of two percent of the voting members,
- c) submit these documents to the Secretary, Rosalind Hood-Morris, 266 Whitmore Drive, Waterloo, Ontario by May 20th 1994.

If alternate nominations are received, elections will be held at the Annual General Meeting.

2. Short video on the preparation of Integrated Circuits.
3. Refreshments.
4. Guided tour of an IC laboratory.

**SLATE PROPOSED BY THE NOMINATING COMMITTEE FOR 1994-1995**

Section Officers:

Chair: Raafat Mansour, ComDev  
Vice Chair: David Wang, U. of Waterloo  
Secretary: Rosalind Hood-Morris,  
Waterloo County Board of Education  
Treasurer: John Mowbray, NCR

Chapter Chairs:

Antennas and Propagation,  
Microwave Theory and Techniques:  
Len Chow, U. Waterloo  
Circuits and Systems,  
Electron Devices: (Arokia Nathan, U. Waterloo  
Computers: Manh Le, NCR

Committee Chairs:

Awards: Shesha Jayaram, U. Waterloo  
Publication: (Tom East, TEES  
(C.R. Selvakumar  
Program: Shesha Jayaram  
Nominations: R.H. MacPhie, U. Waterloo

Student Activities Chairs:

University of Waterloo:  
Daniel Miller  
Brent Nicolle  
Bernhard Woo  
Conestoga College: Jake Huschilt  
Education: Rosalind Hood-Morris  
Membership: Arvind Vyas  
Publicity: Edward Spike

Meet your candidates:

Rafaaf Mansour is a Senior Member of technical staff at ComDev Ltd. He is involved in analysis and design of microwave and millimeter-wave integrated circuits. He is on the editorial board of the IEEE Transactions on Microwave Theory and Techniques.

David Wang is an Associate Professor in the Department of Electrical and Computer Engineering at UW. His research interests include nonlinear control, flexible manipulators, shape memory alloy actuators and the control of human gait.

Rosalind Hood-Morris is Manager of Information Systems at the Waterloo County Board of Education. She has been secretary of the section for several years and was formerly also Awards Chair.

John Mowbray is Electromagnetic Compatibility Engineer at ATT Information Systems (formerly NCR) in Waterloo. He has been Treasurer of the section for several years.

Leonard Chow is a Professor in the Department of Electrical and Computer Engineering at UW. His research interests include microwave integrated circuits and photonics.

Arokia Nathan is an Associate Professor in the Department of Electrical and Computer Engineering at UW. His research interests are in the analysis and simulation of microsensors, as well as in the characterization of new materials for sensing applications.

Manh Le is a Development Engineer at ATT Information Systems (NCR). He specialises in software development.

Shesha Jayaram is an Assistant Professor in the Department of Electrical Engineering at UW. Her research interests include the sterilisation of foods by high fields. She has also been involved in encouraging women to enter and remain in Engineering.

Tom East is sole proprietor of Tom East Engineering Services, with interests in antennas, radar, technical writing and Physics. He has chaired the KW section twice and has edited the newsletter for the past eight years.

C.R. Selvakumar is an Associate Professor in the Department of Electrical and Computer Engineering at UW.

Daniel Miller is an Assistant Professor in the Department of Electrical and Computer Engineering at UW with research interests in control engineering.

Bob MacPhie is a Professor of Electrical and Computer Engineering at UW. He is a Fellow of the IEEE, and chaired the KW section in 1988-1989. His research interests include antennas and microwaves.

**KEITH BALMAIN ON ELECTROMAGNETIC COMPATIBILITY RESEARCH**

Time: Tuesday, June 14, 1994, 5:00 p.m.

Place: University of Waterloo, Davis Centre Room 1302.

Speaker: Professor Keith Balmain, University of Toronto

Subject: Electromagnetic Compatibility Research at the University of Toronto

Dinner: After seminar, to be arranged.

Speaker: Professor Keith Balmain is a full professor of electrical and computer engineering at the University of Toronto. He is an expert both in electromagnetic compatibility and static discharge on the skin of spacecraft.

Subject: Much of the research has focused on the susceptibility of digital circuits to both transient and sinusoidal interfering signals. Susceptibility mapping and stress testing are methods that have emerged from this work. Low-level interference produces delays in digital circuits and leads to new concepts in circuit synthesis for maximum immunity. Prediction techniques require the fusing of linear field theory with nonlinear circuit theory. A significant source of electromagnetic interference is human electrostatic discharge which is shown to be a wave phenomenon; this has been successfully simulated both physically and through numerical computation.

### IEEE CANADA WILL MERGE WITH CSECE

As we reported in the January issue, the Canadian Society for Electrical and Computer Engineering held a vote on merging with IEEE Canada in November and the result was strongly in favour.

If you are a member of IEEE Canada, you also were invited to vote on the proposal. IEEE Canada has about 8000 members who were entitled to vote: the result was: YES 240, NO 10.

The merger is being worked on, with a target for completion of January 1995.

### CONFERENCES IN CANADA 1994

#### 1994

- May 16-20 CAST 94 Fourth International Workshop on Computer Aided Systems Technology. Ottawa. T I Oren 613/564-5068.
- May 17-20 CoopIS 94 Second International Conference on Cooperative Information Systems. Ottawa. John Mylopoulos e-mail jm@cs.toronto.edu.
- May 18-20 IHLSS Seventh International High-Level Synthesis Symposium. Niagara-on-the-Lake, Ont. Daniel Gajski 714/856-4155.
- May 23-25 STOC 26 Symposium on Theory of Computing. Montreal. Michael Goodrich 410/516-8775.
- June 5-10 IEEE Intensive Course on Electrical Contacts. Toronto. 908/562-3895.
- Jun 12-16 INFOCOM 94 Conference on Computer Communications. Toronto. M El Zarki 215/898-9780.
- Jun 21-23 ICAPT 94 International Conference on applications of Photonic Technology Sensing, Signal Processing and Communications. Toronto. G A Lampropoulos 905/658-6353. Kathy Mahoney 613/592-8160.

- Jun 26-29 IEEE/SP 7th Workshop on Statistical Signal and Array Processing. Quebec. D Gingras 418/657-7006.
- Aug 7-10 4th IEEE Workshop on Computers in Power Electronics. Trois-Rivieres, Que. A Skorek 819/376-5071 x3929.
- Aug 24-26 PACT 94 Working Conference on Parallel Architectures and Compilation Techniques. Montreal. Guang Gao 514/398-4446.
- Sep 12-14 PCIC 94 IEEE Petroleum and Chemical Industry Technical Conference. Vancouver. S W Hagemoen 604/736-3381.
- Sep 19-21 REF 94 Fourth Reengineering Forum. Victoria. E J Chikofsky 617/272-0049.
- Sep 19-23 ICSM 94 International Conference on Software Maintenance. Victoria. L J White 216/368-2802.
- Sep 25-28 1994 Canadian Conference on Electrical and Computer Engineering. Halifax. 902/420-7717.
- Sep 28-30 IPCC94 IEEE International Professional Communication Conference. Banff Alta. P R Kostur 306/777-2894.
- Oct 30-Nov 2 INTELEC 94 IEEE International Telecommunications Energy Conference. Vancouver. E Parker 514/639-3030.

#### 1995

- Feb 20-23 INTELCOMM95 - Global Telecommunication Congress and Exhibition. Vancouver. Will Fong 604/669-1090.
- June 4-11 IEEE Holm Conference on Electrical Contacts. Montreal. 908/562-3895.
- Sep 20-23 IEEE Engineering in Medicine and Biology Society. Montreal. Fernand Roberge 514/343-7515.

### INSPEC DATA BASE ADDED TO ASK\*IEEE

Ask\*IEEE, the Institute's document delivery service, now includes publications from the INSPEC database - administered by the United Kingdom's Institution of Electrical Engineers (IEE). Ask\*IEEE, launched in January 1992, permits researchers from around the world to obtain scientific and technical articles rapidly by phone, facsimile, electronic mail and on-line request.

The INSPEC database contains all IEE publications and other indexed materials. In addition to INSPEC, the service incorporates the Institute's journals, conference proceedings and magazines, as well as standards and books - available on an article-by-article basis. Ask\*IEEE also fulfills requests for articles from other publishers.

Documents can be ordered through a toll-free number 1-800-949-IEEE, via FAX 415-259-5045 or through e-mail askiee@ieee.org.

The D channel is used to set up the call and break it down, but you can also use it for X 25 packet switching (example, lottery machines).

The B channel can be used for voice or data. Two B channels together will carry compressed video for teleconferencing.

Even in Microlink, you don't have to sign up for the entire 2B + D channel. You can have a single B channel which handles voice only plus D, or you can have 2B without D for videoconferencing.

In Waterloo, you can sign up if your number starts with 725,746,747,883,884,885,886,888 (that's everyone).

In Kitchener, you can sign up if your number starts with 570,571,572,575,576,578,579,741,742,743,744,745,749. If you are in south Kitchener, you will have to wait.

ISDN will be available throughout Metro Toronto by July 1994. It will be extended to some exchanges around Toronto and to Hamilton in 1994. It already covers Greater Ottawa.

The switched digital network is available from BC through to Quebec, and is being extended into the Maritimes. It covers the US through AT&T, MCI and Sprint: via Teleglobe, it connects with Britain and several European countries, Japan, Hong Kong, Singapore, Australia and New Zealand. In some cases (Sprint and Europe, for example) the clear channel is 56 kb/s as the other 8 kb/s is used for signalling.

Apparently, in Japan there are thousands of N-ISDN capable coin-operated public telephones throughout the country. These have a digital jack for N-ISDN connections (equivalent to BRI).

What does Microlink cost? Bell will tell you, but I can give you some idea. The cheapest service is 2B without D: there is a one-time service charge of \$388 and a \$103 monthly rental. The full 2B + D will cost \$638 one-time and \$133 per month. Long distance charges are extra - for each B channel they are the same as a regular call. Packets on the D channel cost \$2.50 per kilosegment. You may have to buy units to connect your computer to the line. For full details, contact Joe Murphy at (519) 744-0634.

You too can take the ramp on to the Information Highway.

## **WATERLOO'S OPEN TEXT SYSTEM USED BY MANY**

The software developed at UW in 1991 for computerizing the Oxford English Dictionary, called "Open Text", is now used by thousands of clients, such as Mutual Life, Caterpillar Inc. and Grolier Publishing. Under a new agreement between Booz Allen and Open Text Corp., the software will be used by Booz Allen in its Minerva system for company-wide or government information.

## **RADARSAT - CANADA SCANS THE PLANET**

The Remote Sensing Satellite Program is a Canadian Space Agency program to launch and operate a satellite which will look down on the earth with a C band radar and receive details of the surface. The choice of horizontal polarization at 5.3 GHz was influenced by the Canadian requirement to identify ice formations, but the data will be marketed world wide.

ComDev Ltd of Cambridge has been involved in the project since 1990, and is an equity partner in Radarsat International (RSI). ComDev is developing on-board hardware for the Synthetic Aperture Radar, including low power electronics, the high power output circuits for the transmitter and the variable phase shifters for the antenna.

The antenna panels have been made by CAL Corporation of Kanata, Ont. and are being incorporated into the spacecraft by SPAR Aerospace at Ste-Anne-de-Bellevue, Que. MPB Technologies, also of Ste-Anne-de-Bellevue, has received a contract for precision transponders to be used as ground-based external reference standards.

Launch is scheduled for 1995.

## **COMPUTER PORNOGRAPHY**

For the first time in Canada, people operating a computer bulletin board in Winnipeg have been charged with circulating pornography. Items available to anyone with a computer and modem included bondage, sex with minors and bestiality. Computer equipment was seized by police, but later returned without the programs.

The University of Waterloo has cut some newsgroups from Internet carried inside the University, because they may possibly violate the criminal code, reportedly because they were obscene or contained child pornography.

## **TEAMWORK**

The Japanese are legendary for teamwork. An example of this appeared in the advance program for the ISSCC conference in San Francisco February 1994. Paper no 13.4 titled 'A 2/3" 2M-Pixel Stack-CCD Imager' lists 26 authors.

Americans have some way to go, though the Proceedings of the IEEE for February 1992 contained an article titled 'On-Line Power System Security Analysis' by 11 authors. Perhaps fortunately, their photographs and biographies were not available at the time of publication, and did not appear in the usual place at the end of the paper.

## **MANY HANDS MAKE LIGHT WORK**

Q. How many programmers does it take to screw in a light bulb?

A. None - that is a hardware problem.

From Technobabble by John A. Barry (MIT Press).