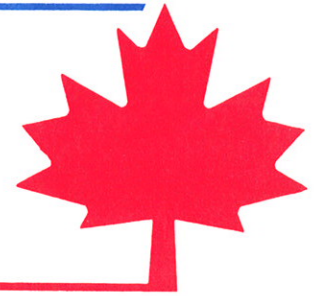




# IEEE NEWSLETTER

## KITCHENER - WATERLOO SECTION



OCTOBER 1990

### COMING EVENTS FOR THE FALL SEASON

Sponsored by the Kitchener-Waterloo Section

- Tues., Oct. 23: John Mowbray, NCR Waterloo, will talk on **ELECTROMAGNETIC COMPATIBILITY-SCIENCE OR BLACK MAGIC**; see page 7.
- Wed., Oct. 24: **IEEE VIDEOCONFERENCE ON EXPERT SYSTEMS AND KNOWLEDGE ACQUISITION**; for more details see page 3.
- Thurs., Nov. 1: **IEEE VIDEOCONFERENCE ON RAPID DEVELOPMENT OF SOFTWARE**; see page 3 for more on this event.
- Wed., Nov. 7: **IEEE VIDEOCONFERENCE ON TOTAL QUALITY: THE MALCOLM BALDRIGE AWARD**; see page 3 for details.
- Tues., Nov. 13: Professor Len Chow, University of Waterloo will lecture on **INTEGRATED CIRCUIT RESEARCH IN MICROWAVE AND RELATED AREAS AT WATERLOO**; details are on page 7.
- Wed., Nov. 14: **IEEE VIDEO CONFERENCE ON 3D COMPUTER GRAPHICS: CONSTRUCTION TO INTERACTION**; see page 3.
- Thurs., Nov. 22: **IEEE DISTINGUISHED LECTURE SERIES II: videotape on THE DESIGN AND DEVELOPMENT OF SPARC**; more information is given on page 8.
- Thurs., Nov. 29: **IEEE VIDEO CONFERENCE ON COMPUTER SIMULATION: ENGINEERING THE FUTURE**; more on page 4.
- Wed., Dec. 12: **IEEE VIDEOCONFERENCE ON FIBER OPTICS APPLICATIONS**; see page 4 for more details.

#### SECTION OFFICERS

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-Stream A: Li Deng, (519)885-1211,ext.6041  
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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.



**NEW REBATE SCHEME CAN HELP THIS SECTION AND YOU**

The IEEE Educational Activities Department has a wealth of courses for you to upgrade your technical knowledge and avoid obsolescence. When you purchase a Self-Study Course you receive videotape, audio tape and/or computer disk, and text. You take the course at home at your own pace at times convenient to you. A Home Video Tutorial consists of a one to two hour course to run on your VCR. There are also Standards Seminars which you can buy.

Look for an insert in the November issue of the Institute with information about these education materials.

When you fill out your order for one of these courses or seminars, fill out the form below as well and send them in together. Then 10% of your fee will come back to the Kitchener-Waterloo section to help us to run things and to keep you posted.

For more information about self-study courses and HVTs contact Lisa Marcy at (908) 562-5500, and about Standards Seminars contact Mary Zwiebel at (908) 562-3804, or write them at 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

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**Standards Seminars Rebate Program**

**I heard about your seminar through my chapter or section. Please credit them with 10% of my registration fee.**

Your Name \_\_\_\_\_

Seminar Title and Date \_\_\_\_\_

Chapter or Section name and location \_\_\_\_\_

*IEEE Staff - Please forward this form together with the registration form to Standards Seminars.*

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**Education Activities Rebate Program\***

**I heard about your educational materials through my chapter or section. Please credit them with 10% of the total purchased.**

Your Name \_\_\_\_\_

Title of Materials purchased \_\_\_\_\_

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Chapter or Section name and location \_\_\_\_\_

*IEEE Staff - Please forward this form together with a copy of the purchase order to Educational Activities.*

**\*Valid until December 31, 1991. Coupon must be submitted with purchase.**

### IEEE VIDEOCONFERENCES

The Kitchener-Waterloo Section will make delayed presentations of the following recent videoconferences. Attendance is free to IEEE members: a small charge will be made for the accompanying set of notes. Non-members can join IEEE at one of the sessions: the dues will cover the whole of 1991.

<u>Date</u>	<u>Title</u>	<u>Meeting Chair</u>
Wed., October 24 2:30-5:30 p.m.	Expert Systems and Knowledge Acquisition Dr. Harry Tenant (TI): Critical importance of integration. Dr. John Mylopoulos (U of Toronto): Expert Systems and databases. Thomas Lafferty (Talarian): Integrating knowledge-based systems into real-time environments.	Dr. P. Dasiewicz
Thurs., November 1 6:30-9:30 p.m.	Rapid Development of Software	Dr. R. Seviora
Wed., November 7 6:30-9:30 p.m.	Total Quality: the Malcolm Baldrige Award has become the equivalent of the Nobel Prize for Quality in the U.S. This program will give you a thorough understanding of its criteria, terminology, scoring system, and key factors found in winning companies. It will feature case studies from Award recipients Xerox and Motorola. Featuring Edward Fuchs (ATT Bell Labs), Edward Finein (Xerox) and William Smith Jr. (Motorla).	Keith Campbell
Wed., November 14 3:00-6:00 p.m.	3D Computer Graphics: Construction to Interaction. Dr. Bruce Naylor (ATT Bell Labs): Geometric modelling techniques. Dr. Patrick Hanrahan (Princeton U): Challenges in rendering 3D Computer Graphics. Dr. Stephen Feiner (Columbia U): Graphical user interfaces in the 1990s.	Dr. W. Loucks

continued on page 4

**IEEE VIDEOCONFERENCES** continued

<b><u>Date</u></b>	<b><u>Title</u></b>	<b><u>Meeting Chair</u></b>
Thurs., November 29 7:00-10:00 p.m.	Computer Simulation: Engineering the Future. Dr. Meng H. Lean (Xerox): Simulation and Synthesis. Dr. Philip L.-F. Liu (Cornell U): Numerical simulation and visualization of non-linear free surface dynamics. Dr. Stephen C.-Y. Lu (U of Illinois): Putting knowledge to work for intelligent simulation.	Dr. W. Loucks
Wed., December 12 3:00-6:00 p.m.	Fiber Optics Applications Dr. Tetsuhiko Ikegami (NTT) Dr. Peter Kaiser (Bellcore) Michael Barnoski (PCO Inc.) Optical fiber transmission in point-to-point telecommunications; connecting directly to residential and business users; local and metropolitan area networks; short distance interconnects within equipment.	Dr. W. Huang

Each session lasts approximately three hours. For exact time and location make contact one week in advance with Mr. Edward Spike as follows :  
Bus:885-1211 ext. 3716, or ask for page at ext 3324, or call Ethel Spike at ext 6740  
Res:884-2129  
E-mail: SPIKE@WATSERV1.UWATERLOO.CA

**CSA SEMINARS ON THE CANADIAN ELECTRICAL CODE**

The Canadian Standards Association is running special two-day seminars on understanding the Canadian Electrical Code, Part 1. Led by electrical and telecommunications experts, these seminars offer information on over 700 changes incorporated into the latest edition of the Code. A seminar is scheduled for Toronto on November 6th and 7th.

For more information please call Suzanna Kiraly at (416) 747-4082 or Caroline Boyle (416) 747-2483.

## A TOUR OF NORTHERN DIGITAL

by Tom East

As we entered the plant on Albert Street, we were greeted by the sight of a skeleton pedalling a stationary bicycle. Tiny infra-red light emitting diodes were attached to his or her elbows, knees and extremities. Our tour guide, Michelle (a live software engineer) explained that special cameras, containing linear CCD arrays, measured the positions of the LEDs many times per second, and a central processor using Transputers converted the data into precise three-dimensional coordinates to be stored for further study. When this was done with live patients, specialists could study gait and diagnose back problems.

Northern Digital, which was founded in 1981, now has customers world-wide for its WATSMART and OPTOTRAK systems. One of them has a lithotripter, which uses shock waves to smash kidney stones without invasive surgery. The contribution of Northern Digital's systems is to measure the exact position and orientation of the ultrasound scanner which is displaying the stones, so that the locations of the stones are known. Other systems are in use in wind tunnels to measure the position and motion of models.

The company has found that to meet its self imposed specifications, it has to exercise stringent quality control over its suppliers: it has moved some operations in-house, such as assembling lenses and machining structures.

The ten of us on the tour took part in a lively question and answer session over coffee and doughnuts. The skeleton did not join us.

## CALLS FOR PAPERS

IEEE-SSIT Interdisciplinary Conference-Preparing For a Sustainable Society

Toronto June 21-22, 1991.

The Toronto Chapter of the Society on Social Implications of Technology and cosponsors are holding a conference at Ryerson Polytechnical Institute, Toronto on June 21 and 22, 1991.

Deadline for one-page abstract of submitted paper is December 15, 1990. Send two copies to Professor H.K. Burkhardt, Polytechnical, 350 Victoria St., Toronto M5B 2K3, Phone: (416) 979-5000 ext. 6974 Fax: (416) 979-5341.

WESCANEX 91 - Regina June 5-7, 1991.

Computer, Power and Communications in a Rural Environment. Deadline December 15, 1990.

## MEETINGS, BLOODY MEETINGS

By Tom East

At the section AGM on May 30th, after election of officers, we enjoyed a movie starring John Kleese, called "Meetings, Bloody Meetings". At bed-time, he is thinking about the two main events of his day tomorrow, neither of which he anticipates with joy: chairing a very important meeting which may get out of hand, and appearing in court to face a charge of "Improper Conduct of a Motor Vehicle".

These ordeals are combined in a nightmare, in which he dreams that he is in court, charged with "Improper Conduct of a Meeting". The judge lambasts him for all the mistakes he has made in past meetings, but releases him on probation on condition that he promises to obey these rules:

1. PLAN                   - clear your mind  
                              - list subjects
2. INFORM               - everyone must know why they are there  
                              - anticipate information flow
3. PREPARE             - logical sequence of items  
                              - time allocation based on importance, not urgency
4. STRUCTURE         - take evidence stage before interpretation stage  
  
   CONTROL           - stop people jumping ahead or going back over old  
                              ground.
5. SUMMARIZE         - all decisions  
   RECORD             - straight away with name of person responsible for  
                              action

[I may have more to say about meetings in future issues-Ed.]

### FOR NON-LOGIC DESIGNERS

People who design chips to perform logic functions have a peculiar language of their own.

+ means OR,

Example:  $A + B$  is true when either  $A$  or  $B$  is true.

$\bar{\quad}$  means NOT or opposite:

Example:  $\bar{A}$  is true when  $A$  is not true.

In the example in our last issue (For logic designers only) the sign seen on a T-shirt read:

$$2B + \bar{2B}$$

Obviously, this means "TO BE OR NOT TO BE" (1)

(1) Shakespeare, W., 1603? "The Tragedy of Hamlet, Prince of Denmark", Act III, Scene 1.

**ELECTROMAGNETIC COMPATIBILITY : SCIENCE OR BLACK MAGIC**

by John Mowbray

Time: Tuesday, October 23, 7:30 p.m.

Place: Room 1304, Davis Centre, University of Waterloo

Speaker: John Mowbray, NCR Waterloo

Dine with the speaker, if you wish. Dinner at McGinnis Landing, 5:45 p.m. Contact Ted Swart 824-4120, ext. 2250.

Many electronic products, especially those containing digital devices, generate radio noise which interferes with reception. Moreover, digital devices such as microcontrollers have to operate in a noise environment generated by licensed radiators such as TV and radio transmitters and walkie-talkies.

This presentation will start with a brief introduction to electromagnetic compatibility and will include discussion of basic sources of interference problems and some relatively simple ways to overcome noise problems. It will also include a summary of regulations in effect, and those which will come into force in Europe in January 1992.

Speaker:

John Mowbray graduated from the University of Waterloo in 1972 and obtained his Master's degree in 1978. He joined NCR in 1972, where he has been a digital designer, supported purchased products and been involved in system integration. He is now the Project Leader for Electromagnetic Compatibility.

**INTEGRATED CIRCUIT RESEARCH IN MICROWAVE  
AND RELATED AREAS AT WATERLOO**

by Y. Leonard Chow

Time: Tuesday, November 13, 7:30 p.m.

Place: Room 1304, Davis Centre, University of Waterloo

Speaker: Professor Y. Leonard Chow,  
Electrical and Computer Engineering Department  
University of Waterloo

Contact: R. H. MacPhie, (519) 885-1211, ext 2842  
Dine with the speaker if you wish: please advise.  
Dinner is at Reuben and Wong's, 110 University Ave. West,  
Waterloo at 6:00 p.m.

This talk will summarize the application of simple quasi-dynamic EM laws (i.e., Coulomb's, Biot-Savart and Faraday's laws with retarded potentials and complex images) to microwave integrated circuits. Despite their simplicity, high accuracy (e.g., 1% or less in amplitude errors) is obtained when compared to experiments. The resulting commercial software EMsim of EEs of Inc. is introduced.

The extension of the above approach to related areas, e.g. electro-sensors, HV grounding problems, electrooptics and cross-talk in digital circuits is discussed.



**NORTH AMERICAN MICROMOUSE CHAMPIONSHIP 1990**

**Ontario Science Centre, Toronto  
October 11 - 14, 1990**

Micromouse is an International activity. Miniature robots constructed by the entrants race to solve complex mazes. Lectures and demonstrations will be held regularly. A Canadian run-off will be held to determine the 1990 champion. Teams from the U.S. will compete for the 1990 North American title. Guest teams from overseas will show the prowess of their designs. All entrants are welcome.

This contest is funded in part by donations from IEEE Canada.

Contact Pam Woodrow at IEEE Canada:  
7061 Yonge Street, Thornhill, Ontario L3T 2A6  
Phone: (416) 881-1930 Fax: (416) 881-2057

The University of Waterloo IEEE Student Branch has entered this competition. Their project has been supported in part by the KW section.

**University of Waterloo Contacts:**

Ed Spike (519) 885-1211 ext. 3716 or 3324  
Roger Sanderson (519) 885-1211 ext. 6184  
Fax: (519) 746-3077  
E-MAIL: MOUSE@SUNEE.UWATERLOO.CA

**THE DESIGN AND DEVELOPMENT OF SPARC**

**Computer Chapter Meeting**

Time: Thursday November 22, 1990 at 7:30 p.m.

Place: Room 1304 Davis Centre, University of Waterloo

Speakers: David Patterson and Wayne Rosing

Contact: For further information, phone Wayne Loucks 885-1211 ext. 3337.

The KW section has recently purchased a series of videotapes of "Distinguished Lecture Series II". This is the first of several planned meetings based on this series. This session raises many questions that should be considered during the design of a processor. Dr. Patterson discusses the design decisions involved in the development of the SPARC chip sets. The SPARC computer architecture was initiated by Sun for their Sun 4 RISC based workstations, but is now available for all computer manufacturers.

Mr. Rosing opens the presentation with a background of the business environment during the development and introduction of SPARC.

Dr. Patterson continues with a technical description of the principles of RISC design and interesting features of SPARC architecture, closing with a historical perspective and thoughts on future directions. He shows us three SPARC boards running at three clock rates progressively taking much more power and board areas.

### IEEE COFFEE MUGS

We have 48 mugs available for sale at a price of \$4.50 each.

These mugs are made of good quality white English ceramic.

They are decorated with:

A gold band at the rim

The IEEE logo in light blue

"Kitchener-Waterloo Section" also in light blue

To arrange to purchase a mug, or for further information contact John Mowbray at 884-1710 ext. 371.

