# RockIEEE Overlook

January 1991

Newsletter of

The Institute of Electrical and Electronics Engineers
Denver Section


## *January Denver Section Meeting*
## *and*
## *Installation of Officers*

On Wednesday, January 16, 1991, the IEEE Denver Section will hold its first meeting of the new year. An awards ceremony will be held recognizing the 1990 Section Executive Board, Executive Committee Chairmen, and the 1990-91 Society Chapter Chairmen. All past Section officers are especially invited to attend.

A program will follow the awards ceremony which begins at 8:00 p.m.

*Speaker*
Ken Janusz, United Engineers, Stearns Roger Division

***"Computer Aided Engineering: More Than Just Graphics"***

This is a dinner meeting which will be held at Writers Manor, 1730 S. Colorado Blvd.

| *Social* | *Dinner* | *Meeting* |
|---|---|---|
| Cash Bar, 6-7 p.m . | $14.00, 7-8 p.m. | 8p.m. |

Reservations for dinner must be made by 1 p.m., January 14. Please call Anita Wanberg, 220-8042 for reservations. Guests are always welcome.

***THANK-YOU to John Tierney at Public Service Company of Colorado for his effort in working with the Denver Section membership database.***

# Society Chapter Meetings and Information

## Front Range Software Quality Committee

Friday, January 11, 1991

Storage Tek
Louisville, Colorado
2:00 - 4:00 p.m.

***Speakers***
Terry Wertz and Carol Goetz
Members of the Product Quality Group
Auto-trol Technology

***Workshop***
***"Requirements for a S/W Defect & Enhancement Tracking System"***

They will be sharing a set of requirements and want active participation of group members to add/change those requirements.

Please call Rick Karcich, 673-6223 for information.

## Joint PES/IAS

***Power Engineering/Industry Applications***

Thursday, January 17, 1991
Brooklyn's Saloon and Restaurant, 572-3999
2644 W. Colfax, Denver (under the viaduct)

6:00 p.m. Social
7:00 p.m. Dinner (optional @ $10)
8:00 p.m. Meeting

***Speakers***
Bill Smith, Associate Director of Aviation
City and County of Denver
&
Jeff Sellon, Project Manager
Behrent Engineering

***"Status Report on the New Denver International Airport"***

Bill Smith will give us an update on the status of the new airport, including discussion of the initial airport configuration, magnitude of construction effort, people mover systems, baggage conveying systems and the controversial fabric roof. Jeff Sellon will discuss the proposed electric distribution system for the new airport, including discussion of FAA electrical system reliability criteria.

Please contact Barbara at Peterson Company, 388-6322, by Monday, January 14, 1990.

## *1st Meeting of the Denver* Power Electronics Chapter

Thursday, January 24, 1991

University of Colorado School of Engineering
Boulder, Colorado
7:00 p.m.

***Speaker***
Dr. Robert Erickson

***"Power Factor Correction"***

Please call Clyde Manning, 682-6492, for the room number and other information.

## Joint AP/MTT/GRS

***Antennas and Propagation, Microwave Theory and Techniques, Geoscience and Remote Sensing***

Thursday, January 17, 1991

National Institute of Standards and Technology
325 Broadway, Boulder, Room 1103
4:00 - 5:00 p.m.

***Speaker***
Zoya Basta Popovic
Department of Electrical and Computer Engineering
University of Colorado, Boulder

***"Grid Oscillators"***

In the microwave and millimeter-wave frequency range, solid-state oscillators have limited output power levels. The alternative high-power sources are tubes, which are expensive, bulky, have a limited lifetime and require high-voltage power supplies. Combining a large number of low-power solid-state negative resistance devices becomes attractive. A coherent oscillator that can combine thousands of solid-state devices is presented. In this approach, the active devices load a two-dimensional metal grid that radiates, and the power combining is done in free space. A 100-MESFET hybrid grid oscillator locks at 5 GHz with an ERP of 24 Watts and a conversion efficiency of 20%. An equivalent embedding circuit for the devices in the grid predicts the oscillation frequency. The devices in the grid self-lock with no external locking signal present, but the grid can also be externally injection-locked. The grid oscillator is a planar structure suitable for wafer-scale monolithic integration.

No reservations are required. Please call Katie MacReynolds at 497-3471 for information.

## Joint CS/IT

***Computer Society/Information Theory Society***

**Thursday, January 17, 1991**

**University of Colorado, Boulder**
**Engineering Center Classroom CR1-9**
**7:00 p.m.**

**(CR1-9 is on the south side of the Engineering Center on the south-entry level. Parking is available in the lot east of the Engineering Center).**

***Speaker***
Dr. William Waite
Professor of Electrical and Computer Engineering
University of Colorado, Boulder

Dr. Waite has taught at universities in Australia and Germany, and lectured at several of the advanced courses given by the European Economic community. In 1973-74 he was ACM National Lecturer, and he has been Editor of the *Operating Systems Review* since 1972. His major research interests are the design and translation of programming languages, and he was Chairman of IFIP Working Group 2.4 (systems Implementation Languages) from 1983 to 1990. Dr. Waite has written numerous technical articles and three books, the most recent of which is *Compiler Construction*, co-authored with Gerhard Goos.

***"How to Automate the Solution of a Complex Problem"***

Problem solving involves understanding the problem, having an idea, showing that the idea solves the problem, and then implementing the idea. This process can be automated when we can understand the problem by recognizing it as an instance of a previously-solved problem. If the previously-solved problem is one that must be decomposed into a number of other problems, successful automation must overcome some significant barriers. We have developed a flexible, powerful approach to such automation tasks. Eli, a system that constructs complete compilers from specifications, has been used as a vehicle for demonstrating this technology. This talk explores the barriers to successful automation of complex problem solutions, and shows how Eli surmounts them.

Please call (voice mail) Bryce Chapman at 673-4762 or Rory Laiho at 924-7534 for reservations.



# Chairman's Message

***by Gary Petersen***

Happy New Year!! As we begin a new year it is worth taking a minute to review the status of the Denver Section.

The Denver Section reached its 75th anniversary during 1990, and was honored for this achievement at the IEEE Sections Congress in Toronto. Section membership now exceeds 5,000 members, including 600 student members at eight universities. We have 13 active Chapters representing 17 technical societies. The Denver Section will have a 1991 operating budget of approximately $25,000.

In 1991 the Section will continue to support technical and professional growth through society meetings, conferences, tutorials, pre-college and college student programs and liaison with local industry.

I challenge all Denver Section members to recognize the benefits t be realized from active IEEE participation. Volunteer assistance and meeting attendance benefit your professional development and the Section becomes even stronger. Do your career a favor -- get involved !! Call me or any of the Executive Board if you'd like to help.



**Engineering Fundamentals Refresher Course**
**Metropolitan State College of Denver**
Spring Semester 1991

**Six Saturday mornings 0800-1200 from Feb. 2 to Mar. 9 1991. Call (303) 556-2503 or 2977, or mail form below.**

**MSCD Engineering Fundamentals Refresher Course**
Spring 1991 Registration form - Donation $125 payable to Engineering Technology Program

Name _____

Address _____

Mail to: E.I.T. Refresher Course, Box 90, Metro. State College of Denver, P.O. Box 173362, Denver CO 80217-3362

# Continuing Education

Persons engaged in Electrical Engineering find that the practice takes them to the boundaries of their experience and education. Many would like to expand those boundaries, in areas they may not have had a previous opportunity to study or in fields where the body of knowledge is increasing each year.

Continuing Education is available from many sources. Equipment vendors offer presentations which are an hour to a day in length. Colleges and universities offer courses in the day, evening, by mail, or by video tape. They may be in the traditional format with several hours per week of instruction for a semester or eight-hours a day for several days to a week. Many companies with expertise gained from practice in research in a particular field offer continuing education courses of one to five days in duration.

The joint PES/IAS Society Chapter in Denver has offered tutorials for several years. Past subjects have included "Industrial Power Systems", "Symmetrical Components", "Transformers", "Induction Motors", and "Personal Protective Grounding". This year the Chapter has scheduled two 4-hour tutorials. The tentative schedule is listed below. Look for details on registration on the enclosed flyer.

***Friday, February 9, 1991***
8:00 a.m. - Noon

***Location***
USBR Research & Laboratory Building
Bldg. #56, Room #2770
Denver Federal Center, Lakewood, CO

***Topic***
"Analysis of System Harmonics Due to Adjustable Speed Motor Drives"

***Speaker***
Malin Jacobs
U.S. Bureau of Reclamation

***Friday, April 5, 1991***
8:00 a.m. - Noon

***Location***
Public Service Company Training Center
38th Ave.
Denver, CO

***Topic***
"Fundamentals of Relay Protection"

***Speaker***
William Roemish
University of Colorado at Denver



# CU-Denver Using Hi-Tech Delivery Systems for Electrical Power Short Course

The University of Colorado at Denver has taken another step forward in it's presentation of one-day short courses on selected topics in electrical power systems, machines, and energy. On December 7, 1990, the CU-Denver Division of Extended Studies, working in conjunction with the Department of Electrical Engineering and Computer Science, conducted a course on "Fundamentals of Power Systems Design" in two locations at one time using the University's fiber optic cable network.

Dr. Pankaj K. Sen, P.E., and Dr. William R. Roemish, P.E., physically presented the course in a video classroom on the CU-Denver (Auraria) campus while a simultaneous, fully-interactive session was being hosted by the Division of Continuing Education on the University of Colorado at Colorado Springs (UCCS) campus. With the two-way audio/video hookup, engineers participating in the Colorado Springs classroom were able to ask questions by simply raising their hands. Each Colorado Springs participant had his/her own push-button microphone which allowed him to talk directly to the instructors and interact with fellow participants in the Denver classroom.

The University is in its second year of offering these electrical power short courses, and participants have come from as far away as Rapid City, South Dakota, and Mills (north of Casper), Wyoming. Topics that are being considered for the late spring/early summer include harmonics, lighting design, branch circuits, and electrical systems design for buildings. Future plans include taking the short courses on-site to large employers, either in-person or by broadcast using the University's short wave (ITFS) system. The December 7th "Fundamentals" course is also available on video tape.

*Arne Arnesen, Director of Corporate Programs*
*CU-Denver Division of Extended Studies*

# New Denver Section Policy Statement

It is the desire of the IEEE Denver Section that all meetings and functions be held in handicap accessible locations.

# IEEE PES/IAS 1990/1991 Tentative Meeting Schedule

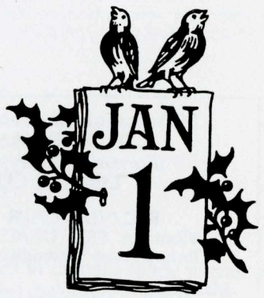
February 21, 1991
***"Sidney Back-To-Back DC Converter Station"***

March 21, 1991
***"Geomagnetic Induced Currents"***

April 18, 1991
***IEEE Denver Section All Chapters Meeting***
Topic to be announced

May 16, 1991
***Tour of New Public Service Co. of Colorado "Gas Insulated Substation" In Downtown Denver***






# A Darwinian Creation of Software

*by Rick Karcich*

Earlier this year the New York Times published an article describing a fledgling science that creates software whose behavior mimics that of living creatures. The science is known as "artificial life" and has been an active research field for only about three years. Its practitioners have produced computer programs that can actually evolve into more powerful programs through their own interaction and merging to create a new generation - a Darwinian process similar to that of biological organisms. Could this have implications for the creation of fault-tolerant software?

Artificial life is similar to artificial intelligence. However, artificial intelligence strives to create systems that mimic the way the human brain works, while artificial life starts at a lower but still prodigiously complex level - simulating the life of organisms as simple as bacteria. Life at this level is characterized by a self-organizing and adaptive behavior. Does such behavior serve to make life tolerant either of insults inflicted on it by its environment or of faults inherent in its genetic makeup? If our software could take the place of these living organisms could we use knowledge of this behavior to make our software more robust?

If researchers can determine how and why certain features and behaviors develop during evolution, then they can evolve software that is especially well suited to certain tasks, simplifying software development. Artificial life also lends itself to the creation of extremely complex software for such applications as advanced robotics.

The Front Range Software Quality Committee would like your response to some of the questions raised in this article. Please respond to Terry Wertz at Auto-trol Technology.



# Schedule of Conferences and Meetings

| | | | | |
|---|---|---|---|---|
| September 11-12, 1990 | Boulder | Symposium in Optical Fiber Meas. | Douglas Franzen | (303) 497-3346 |
| February 3-8, 1991 | Crested Butte | Aerospace Applications Conf. | Leo Mallette | (213) 334-2909 |
| | | | Richard Day | (714) 863-0350 |
| April 12-14, 1991 | Laramie | Region 5 Conference | Sadrul Ula | (307) 766-6268 |
| April 28 - May 2, 1991 | Boulder | PES Substation Com. Mtg. | George Flaig | (303) 452-6111 |
| June 23 - 27, 1991 | Denver | International Communications Conf. | Russ Johnson | (303) 796-9100 |
| May 11 - 13, 1992 | Denver | Vehicular Technology Conf. (VTC '92) | Don Cottrell | (303) 871-3752 |
| September 10-14, 1995 | Denver | Petroleum & Chemical (PCIC) | John Nelson | (303) 431-7895 |
| July, 1996 | Denver | PES Summer Meeting | John Barnick | (303) 969-0391 |
| May 1997 | Denver | MTT | Hussain Haddad | (303) 460-2114 |
| | | | John Dunn | (303) 449-1055 |
| | | | Claude Weil | (303) 497-5305 |

## Proposed Conferences and Meetings

IAS 1994
ACM/IEEE Design Automation 1994
PES Joint Power Generation 1994
ESMO 1996
Transmission & Distribution 1997
ITC 2000

# The Institute of Electrical and Electronics Engineers - Denver Section

## Executive Board




**The Institute of Electrical and Electronics Engineers**
Denver Section
P.O. Box 4056
Englewood CO 80155-4056
Phone: 220-8042



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## *The Month at a Glance*

***January 11, 1991***
Front Range Software Quality Meeting

***January 16, 1991***
Denver Section Meeting

***January 17, 1991***
CS/IT Meeting
APP/MTT/GRS Meeting
PES/IAS Meeting

***January 24, 1991***
Power Electronics Meeting


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