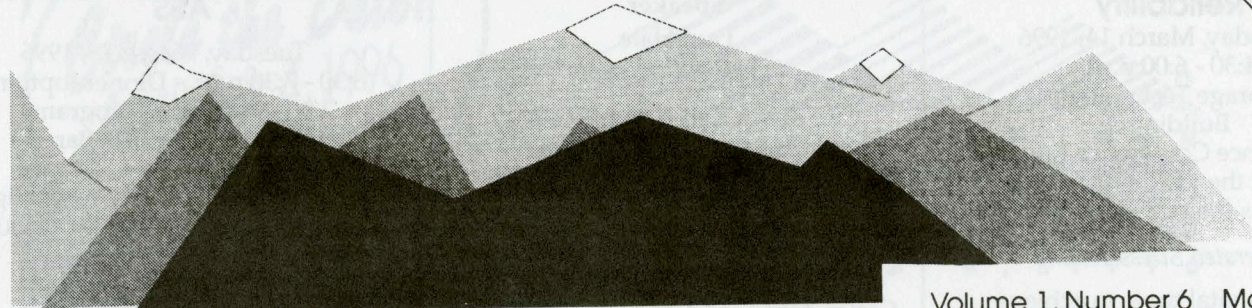


# RockIEEE Overlook



Volume 1, Number 6 March 1996

## Chairman's Message

by David Richmond

It appears that 1996 is a pivotal year for the Denver Section. Late last year the IEEE Regional Activities notified the Denver Section that four of our twelve Chapters should be dissolved for violation of Section 406.4 of the Bylaws. The four Chapters, AES-10, EMB-18, IM-09, and PES western slope, have not reported any meetings for an extended period of time. The requirements of Bylaw 406.4 state that a Chapter must hold no fewer than two meetings per year and have an attendance of at least ten people, not including students. The failure to meet and the lack of reporting forced the decision to dissolve two of the four Chapters in 1996. Bylaw 406.5 states, a Chapter shall be dissolved automatically if it fails to meet attendance and meeting requirements for three consecutive years. AES and EMB were retained for a year because there has been an expression of interest and attempts to revive the chapters.

Lead the way, in 1996 become active in your Chapter and don't let

this happen again. Chapter meetings provide professional enrichment and bring members together to discuss issues which affect our profession. Attending a chapter meeting is the least expensive way to continue your education and maintain your technical expertise. Chapters members are exposed to up-to-date technical information through the technical meetings. The subject areas are determined by the members. IEEE Chapters provide many opportunities to network with other professionals specializing in the same technical areas. I urge you to get involved before it is too late and your society is not represented. You can make a difference!

For the past several years, I have been a user of e-mail. Within a few months I was convinced that it was more than an interesting toy. I began using it to communicate with friends, colleagues and clients. I could go on, but if you haven't tried it, you are missing a good thing. IEEE has a number of useful features that are

available on the Internet and the World Wide Web. The server which I was using was recently shut down. In my search to replace the e-mail connection I learned of a new IEEE benefit. If you have access to the Internet you can request an alias to replace the multi-digit name you received from your present Internet server.

You can get an e-mail alias address by sending an e-mail message to [aliases@ieee.org](mailto:aliases@ieee.org) with the following information:

- Last name
- First name
- Daytime phone number
- fax number
- IEEE membership number
- Current volunteer activity (if any)

The advantage of doing this is that if you change service providers in the future, you are still accessible from the same address by just notifying IEEE. My Internet address is [d.richmond@ieee.org](mailto:d.richmond@ieee.org). If I ever change my server again, my address will still be the same.

## Darrell Sabatka - Awards Chair

Section and service awards will be presented at the April dinner meeting. The Denver Section will present the John Peebles Professional Award, Section Service Award, Outstanding Society Chapter Award, and Outstanding Student Branch Award.

The Awards Committee requests input from all Denver Section members and nominations for award candidates are welcome from individuals, Chapters or Professional Societies. If you would like to nominate a candidate for any of these awards, contact the Awards Committee Chair identified on the back of each month's Overlook.

More information on these awards will be provided in the April Overlook.

IEEE also has a Home page which can lead you to all of the services offered by IEEE. Everything from obtaining technical literature, finding a job, to having their travel service make reservations for you at that Caribbean resort. Their address is: <http://www.ieee.org>. Come aboard, surf the net.

RockIEEE Overlook  
Official Publication of the  
IEEE Denver Section  
1834 Fillmore Ct., Louisville, CO 80027-1122  
Published Jan. - May, Sept. - Nov.



# Meetings

## Reliability

Thursday, March 14, 1996

4:30 - 6:00 p.m.

Storage Technology  
Building 3

Excellence Conference Room  
Sign in at the visitor's center and  
walk across the street to building 3.

### "Accelerated Stress Testing"

This is a vital topic to achieve  
reliable parts and systems with  
today's emphasis on shorter develop-  
ment cycles. Come hear Kirk Gray  
give the foundation principles of this  
critical reliability enhancement  
approach.

Call Mr. Joe Diele at 673-5667 to  
confirm your plans to attend. Free  
pizza and pop provided.

**\*\*Note:** The Denver Reliability  
Chapter was awarded First Place by  
the U.S. Reliability ADCOM in the  
annual contest for membership and  
number of meetings in 1995.

## AP-S/MTT-S/GRS-S

Thursday, March 21, 1996

4:00 p.m. NIST, Room 4020

325 Broadway, Boulder, Colorado

### Speaker

Dr. Huey-Daw Wu  
University of Colorado - Boulder  
Dept. of Electrical Engineering  
*"Thin-Film Ferroelectric Coplanar  
Waveguide Phase Shifters Operating at  
Room Temperature"*

For more information contact  
Richard G. Geyer, (303) 497-5852.

## Lasers and Electro-Optics

March 21, 1996

7:00 p.m. Refreshments,

7:30 p.m. program

NIST, Room 1107

325 Broadway, Boulder, Colorado

## T3 Systems

### Thad Smith

We develop software and firmware for real-time measurement  
and control applications, targeting embedded microprocessors  
and PCs.

- Data Collection and Communications
- Motion Control, Custom Interfaces
- User presentation in DOS & MS Windows

Free estimates

(303) 449-3322

## Speaker

Paul Hale

### "High Speed Detectors"

Call Kevin Keilbach at 673-1349  
before meetings to confirm times and  
location. Following are the upcom-  
ing meetings:

On April 18, 1996, Chris Monroe:  
*"Quantum Computation with Laser-  
Cooled Atoms"* and on May 23 1996,  
Steven Block (OSA Eastman  
Speaker): *"Using Optical Tweezers to  
study Biological Motors"*.

## Joint Power Engineering & Industry Application

Thursday, March 21, 1996

### Tour

Lockheed Martin Astronautics -  
Waterton Facility  
4:00 p.m. at Visitor's parking lot.

The tour will be conducted by a  
Lockheed Martin Engineer and will  
show the facilities where design,  
development, manufacturing, and  
testing of advanced technology sys-  
tems for space and defense takes  
place. Their chief products include  
space systems and space launch sys-  
tems. Lockheed Martin is the home  
of the Titan and Atlas series of space  
launch vehicles.

The Lockheed Martin Waterton  
facility is located at the southern ter-  
mination of Wadsworth Blvd. (Hwy.  
121). As you approach the entrance,  
pull into the visitor parking lot on the  
right side of the road. Go into the  
security building, sign in, and get a  
visitor's badge. The tour guide will  
meet you at this location.

Please call Barbara at Peterson  
Company (303) 388-6322 for dinner  
reservations by March 18.

## AES

Tuesday, March 28, 1996

6:30 - 7:30 p.m. - Dinner (optional)

7:30 - 9:00 p.m. - Program

Brooklyn's Sports Bar

2644 W. Colfax Ave., Denver

(1 block S. of McNichols/Mile High)

Cost: Dinner \$12.00, Mtg. \$2.00

### Speaker

John C. Tsucalas

AES Chapter Chair

"Chapter Organization, Goals, and  
Activities"

The Aerospace and Electronic  
Systems Chapter has been inactive  
for some time. This is a call to all  
members of the AES society, and  
unaffiliated IEEE members, who  
would like to be involved in a new  
and interactive AES Chapter.

This meeting will be an open dis-  
cussion of chapter plans including  
nomination of officers, meeting types,  
places and schedules, survey of tech-  
nical interests, programs for students  
and new engineers, and ad-hoc com-  
mittee goals. Please bring your ideas,  
so we can develop a plan that is  
meaningful to AES members.

Please call John Tsucalas at (303)  
798-5769 by Friday March 22, 1996,  
for additional details and to confirm  
time and location.

## EMC

The next EMC meeting will be at  
the regional EMC Symposium on  
Friday, April 12, 1996.

Anyone interested in helping with  
the 1998 IEEE International EMC  
Symposium in Denver should contact  
George Trejo, Bill Ritenour, or Barry  
Wallen.

## NOLAN LABORATORIES, INC.

Consultation, Design, Test and Manufacture

- Electromagnetics
- RF & Microwave
- Bioelectromagnetic Sensors

- Antennas
- EM/RFI
- Optics

James A. Nolan, MSEE  
President

P.O. Box 567  
Confler, CO 80433  
(303) 838-0057 Phone/Fax

*Circle the Date!*  
April 3 & 4, 1996  
Denver



Wednesday • April 3  
8 a.m. to 7 p.m.

Thursday • April 4  
8 a.m. to 5 p.m.

Colorado Convention Center, Denver

Visit the Best Selection of  
Electronics, Instrumentation and  
Manufacturing Technologies  
Assembled in the Rocky Mountain Region.

450 Booths  
Over 2,000 Product Lines

## FREE PARKING

East side, McNichols Sports Arena  
(next to Mile High Stadium)

**FREE continuous shuttles directly to convention door**

FOR COMPLETE INFORMATION,

CALL (303) 799-0650

or call the EXPO fax request line (303) 727-4768.

e-mail: showmgr@rmtechexpo.com

Visit us on the web at <http://www.rmtechexpo.com>



ROCKY MOUNTAIN  
CHAPTER



DENVER SECTION



**FREE PARKING**  
East side, McNichols Sports Arena  
(Next to Mile High Stadium)



### FREE CONTINUOUS SHUTTLES

Shuttle buses between the lot and convention center will run continuously every 20 minutes beginning at 7:40 a.m.



DENVER SECTION



ROCKY MOUNTAIN CHAPTER

## FREE EXHIBIT ADMISSION FORM (Save \$10 on at-door admission fee)

First Name \_\_\_\_\_ Last Name \_\_\_\_\_  
Company/Position \_\_\_\_\_  
Address \_\_\_\_\_ Dept/MS \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_ e-mail \_\_\_\_\_

### COMPANY/ORGANIZATION CLASSIFICATION

- A ☐ Aerospace  
B ☐ Communications  
C ☐ Computers  
D ☐ Consumer/Entertainment  
E ☐ Engineering/Consulting  
F ☐ Electronic Components/Devices  
G ☐ Government/Military  
H ☐ Medical  
I ☐ Test Equipment  
J ☐ Other \_\_\_\_\_

### JOB FUNCTION

- A ☐ Administration/Management  
B ☐ Design  
C ☐ Engineering  
D ☐ Marketing/Sales  
E ☐ Packaging  
F ☐ Production/Manufacturing  
G ☐ Purchasing  
H ☐ Research/Development  
I ☐ Test/QC/QA  
J ☐ Other \_\_\_\_\_

### INTEREST

- A ☐ CAD/CAM/CAE  
B ☐ Computer Peripherals/Software  
C ☐ Consulting/Fabrication Services  
D ☐ Controls  
E ☐ Electro-Mechanical Components  
F ☐ Electronic Packaging  
G ☐ Instrumentation/Test Equipment  
H ☐ Measurement Systems  
I ☐ Production Equipment/Materials  
J ☐ RF and Microwave Products  
K ☐ Test/Inspection Equipment  
L ☐ Other \_\_\_\_\_

COMPANY SIZE ☐ 5-50 ☐ 51-250 ☐ 251-500 ☐ over 500

## REGISTER FOR THE TECHNOLOGY FORUM

25 Free Seminars Available • Call the EXPO Fax Request Line 727-4768 for complete information

3-DAY COURSE • Tuesday, April 2 through Thursday, April 4 • 8:30 a.m. – 4:30 p.m. (daily)

☐ Instrumentation & Control Fundamentals ISA/ICS Members \$752; Non-Members \$900

### WEDNESDAY, April 3, 1996

- |   |                        |   |
|---|------------------------|---|
| <input type="checkbox"/> Basics of Programmable Controllers                                       | 9:00 a.m. – 12 noon    | \$75  |
| <input type="checkbox"/> Lead-Free Soldering in Electronics                                       | 9:30 a.m. – 3:30 p.m.  | SMTA/ISHM Member \$50; Non-Member \$75  |
| <input type="checkbox"/> Negotiation: Fads, Fears, Facts & Fallacies                              | 9:00 a.m. – 12 noon    | NAPM Member \$60 1/2 day; \$100 Full Day<br>Non-Member \$75 1/2 day; \$125 Full Day |
| <input type="checkbox"/> Supplier Partnerships: The Competitive Advantage                         | 1:00 p.m. – 4:00 p.m.  | Seminars qualify for one (1) C.P.M. point   |
| <input type="checkbox"/> Concurrent Engineering   | 9:00 a.m. – 12 noon    | SMTA/ISHM Member \$50; Non-Member \$75  |
| <input type="checkbox"/> RF and Wireless  | 1:00 p.m. – 4:00 p.m.  | SMTA/ISHM Member \$50; Non-Member \$75  |
| <input type="checkbox"/> Software Reliability and Quality   | 9:00 a.m. – 12 noon    | IEEE Member \$50; Non-Member \$75   |
| <input type="checkbox"/> Basic Reliability for Design Engineers with Emphasis on Failure Analysis | 1:00 p.m. – 4:00 p.m.  | IEEE Member \$50; Non-Member \$75   |
| <input type="checkbox"/> Design for Manufacturability (four sessions)                             |                        | SME Member \$40; Non-Member \$60  |
| Physical Considerations   | 9:00 a.m. – 10:15 a.m. |   |
| Electronic Considerations   | 10:30 a.m. – 12 noon   |   |
| Rapid Prototyping   | 1:00 p.m. – 2:30 p.m.  |   |
| Solid Modeling  | 3:00 p.m. – 4:30 p.m.  |   |

### THURSDAY, April 4, 1996

- |   |                        |   |
|---|------------------------|---|
| <input type="checkbox"/> Control System Tutorial  | 8:30 a.m. – 12:30 p.m. | \$75  |
| <input type="checkbox"/> Fundamentals of 3D Mechanical CAD                                      | 9:00 a.m. – 4:00 p.m.  | \$75 (Sponsor: Prof. AutoCAD User Group of Denver)                                  |
| <input type="checkbox"/> Negotiation: Fads, Fears, Facts & Fallacies                            | 9:00 a.m. – 12 noon    | NAPM Member \$60 1/2 day; \$100 Full Day<br>Non-Member \$75 1/2 day; \$125 Full Day |
| <input type="checkbox"/> Optimum Designs in Half the Time (through Quality Function Deployment) | 9:00 a.m. – 12 noon    | IEEE Member \$50; Non-Member \$75   |
| <input type="checkbox"/> Process Engineering: The Right Tools for the Job                       | 1:00 p.m. – 4:00 p.m.  | IEEE Member \$50; Non-Member \$75   |
| <input type="checkbox"/> Design for Manufacturability Principles                                | 1:00 p.m. – 4:00 p.m.  | IEEE Member \$50; Non-Member \$75   |

## FOR MORE INFORMATION OR TO PRE-REGISTER

☐ My check made payable to Rocky Mountain Technology Expo is enclosed to cover the optional forum registrations.

Mail or FAX form to:

Rocky Mountain Technology Expo  
6535 South Dayton St., Suite 3000  
Englewood, CO 80111  
Phone (303) 799-0650

FAX (303) 799-0678

Home Page: <http://www.rmtechexpo.com>  
e-mail: [showmgr@rmtechexpo.com](mailto:showmgr@rmtechexpo.com)

## Call for Papers - EMC Society

The Rocky Mountain Chapter of the Institute of Electrical and Electronic Engineers (IEEE) Electromagnetic Compatibility (EMC) Society will hold its sixth-annual regional EMC symposium on Friday April 12, 1996 at the National Institute of Standards and Technology in Boulder, Colorado. The Chapter seeks informal papers on all aspects of EMC including:

Printed Circuit Board Design  
Grounding  
Cabling  
Shielding  
Electromagnetic Interferences  
Radio-frequency Immunity  
Electrostatic Discharge

Lightning  
Powerline Disturbances  
System-level EMC  
Medical Electronics  
Test Facilities  
Instrumentation  
Standards

Authors should submit a title by March 6, 1996 to:

Robert F. German  
Henry Ott Consultants  
1410 Moss Rock Place  
Boulder, Colorado 80304  
Telephone/Fax: (303) 444-2472

Each presentation will be 20 minutes with an additional 10 minutes for questions. Written manuscripts are not required because a symposium record will not be published. Lunch will be provided for the speakers.

## IEEE Technical Seminars at the Rocky Mountain Technology EXPO

The IEEE Reliability Society is putting on five technical seminars at the Rocky Mountain Technology EXPO on April 3-4, 1996. This is a great opportunity to sharpen your tools for "developing the right product and developing your product right." All of the instructors are world class and the half day seminars are offered at the very nominal cost of \$50 for IEEE members.

Watch for more information in next months newsletter, or contact EXPO direct at:

Phone: (303) 799-0650

Fax: (303) 799-0678

Fax request: (303) 727-4768

email: [showmgr@rmtechexpo.com](mailto:showmgr@rmtechexpo.com)

Web: <http://www.rmtechexpo.com>

### Serving Colorado and The World — Since 1885 —

- Power
- Mining & Metals
- Petroleum & Petrochemicals
- Electronics
- Aerospace & Defense
- Biotechnology
- Pharmaceuticals
- Hazardous Waste Management
- Food & Consumer Products
- Airports/Infrastructure
- Environmental

**Raytheon**  
Engineers & Constructors

P.O. Box 5888  
Denver, CO 80217  
(303) 8432422

### Metropolitan State College of Denver

Electronics Engineering Technology  
Bachelor of Science Program

Offering the following special classes Summer Semester

EET235 Advanced Technical Programming using C  
Tuesday and Thursday 1730-1845

EET373 Process Control Systems  
Mondays 1730-1910

EET374 Programmable Logic Controllers  
Wednesdays 1730-1910

Please contact the Dept. for prerequisites and additional details

Phone: (303) 556-2503, Internet: [SynhornsJ@MSCD.edu](mailto:SynhornsJ@MSCD.edu)

Check our WWW page: <http://www.mscd.edu/~ballk/eet.html>

## University of Colorado at Denver

### Courses for Spring Term 1996

NCES 8050 Professional Engineer's Examination Refresher Course for Electrical Engineering  
Saturdays, March 2 - April 6, 8 a.m. to noon. \$295

NCES 8614 Materials Engineering Principles Applied to Communications and Computer Products  
Thursday & Friday, March 21-22, 8 a.m. to 5 p.m. \$495

NCES 8612 Fundamentals of Electric Power Engineering  
Monday - Tuesday, April 22-24, 8 a.m. to 5 p.m. \$495

NCES 8611 Fundamentals of Power Quality Engineering  
Monday - Tuesday, May 13-14, 8 a.m. to 5 p.m. \$495

For more information and a detailed flyer please contact Continuing Engineering Education at 556-4907.





# The Institute of Electrical and Electronics Engineers - Denver Section

Chair	Chair-elect	Sr. Vice Chair	Vice Chair Member Services	Vice Chair Student Activities	Secretary	Treasurer
David Richmond Raytheon Engineers & Constructors P.O. Box 5888 Denver, CO 80217 (303) 843-2465 d.richmond@ieee.org	Fred Jones EMC Engineers 2750 S. Wadsworth Denver, CO 80227 (303) 988-2951 (303) 985-2527 Fax	Ron DeLyser University of Denver Dept. of Engineering 2390 S. York St. Denver, CO 80208 (303) 871-2034 (303) 871-4450 Fax	John R. Adams Valley Lab Inc. 5920 Longbow Dr. Boulder, CO 80301 (303) 530-6503 (303) 530-6313 Fax jadams@pfizer.com	Cliff Alston Denver Technical College 925 S. Niagara St. Denver, CO 80224-1658 (303) 329-3340 (303) 320-3412 Fax	W. Kevin Wright NEI, Inc. P.O. Box 1265 Arvada, CO 80001 (303) 431-7895 (303) 431-1836 Fax	David Edwards RMH Group 12600 W. Colfax Lakewood, CO 80215 (303) 239-2771 (303) 235-0218 Fax

Society Chapters - Fred Jones, (303) 988-2951  
Awards - Darrell Sabatka, (303) 329-1547  
Student Fund - Edward Pitchkolan, (303) 966-3707  
Student Branch Activities - Trevor Pfaff, (303) 421-7910  
Consulting Network - Tim Davis, (303) 466-1117, timdavis@tdcon.com  
Professional Activities (PACE) - open  
Black Hills Subsection - Michael Pendo, (605) 394-5278  
Centennial Subsection - Richard Sandige (307) 766-6181  
Nominations - Bob Struthers, (303) 843-2235

Professional/Industry Liaison - open  
Membership - open  
Pre-College Student Activities - Jeff Wilson, (303) 388-6322  
Educational Activities -  
Conference Activities - Jim Schroeder, (303) 871-3519, Fax: (303) 871-4450  
jschroed@du.edu  
RockIEEE Overlook Editor - Victor Cheung, (303) 751-0741, Fax: (303) 751-2581,  
Publisher - Anita Wanberg, Phone/Fax: (303) 220-8042

## Chapter Officers

Magnetics - Jim Cates, (303) 673-4126, Fax: (303) 673-6540  
Joint Vehicular Technology/Communications - David Iliff, 757-1797  
Joint Industry Applications/Power Engineering - Jim Houlihan, (303) 666-4525  
Reliability - Sam Keane, (303) 673-5963  
Laser & Electro-Optics - Kevin Keilbach, (303) 673-1349, kevin@ohmeda.com  
Components, Packaging, Mfg. Tech - Mike Erni, (303) 678-2437  
Engineering in Medicine & Biology - Norbert Kaula, (303) 270-8973,  
norbert.kaula@uchsc.edu

Joint Computer/Information Theory - "Shah" Bhatti, (303) 673-8915  
Electromagnetic Compatibility - George Trejo, (303) 350-4113  
Joint Antenna & Propagation/Microwave Theory & Technology/Geoscience &  
Remote Sensing - Richard Geyer, (303) 497-5852  
Aerospace and Electronic Systems - John Tsucalas, (303) 798-5769 \*\*  
\*\* Anyone interested in revitalizing the Aerospace Chapter please call  
John Tsucalas at (303) 798-5769.

Please notify IEEE headquarters of any changes to your address and/or phone number by calling  
1-800-678-IEEE (4333). We can not change this information in the Denver Area.

The Institute of Electrical and Electronics Engineers



Denver Section  
c/o John Adams  
5920 Longbow Dr.  
Boulder, CO 80301

Non Profit Org.  
U.S. Postage  
**PAID**  
Denver CO  
Permit No. 1993

## Advertising Rates

Your business card or camera-ready artwork can be placed here for exposure to 4000+ engineers, scientists, and managers. Rates are as follows.

Ad Size	Single	Multi
Business Card	\$ 25	\$ 20
1/8 page	60	50
1/4 page	150	130
1/2 page	250	225
Full page	400	360
1 page insert	250	200

Send business cards or copy to Anita Wanberg, P.O. Box 4056, Englewood CO 80155-4056. Make checks payable to IEEE Denver Section.

02/14/96 DNVR  
DAVID RICHMOND  
2921 SO SIDNEY COURT  
DENVER CO 80231