

## IEEE North Jersey Section Calendar

**September 12--**"Fiber Optic Sensors"--North Jersey Section, Industry Application Society, 6:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. **Reservations required for dinner buffet.** David Perry (201) 325-8415.

**September 13--**"The Meaning Of Chaos In The Vasculature"--The Metropolitan Chapter of Engineering in Medicine and Biology Society, 7:30 PM, Rockefeller University, York Ave. at 66th St., Room 305, NYC. Vijay Kowtha (201) 932-4803.

**September 14--**"PACE Meeting: Management, Executive Functions And Entrepreneurial Activities"--North Jersey Section PACE, 7:30 PM, ITT Auditorium, Nutley, N.J. Richard Tax (201) 664-0803.

**September 18--**"What Motivates Engineers?: Understanding Employee Motivation—Theory And Practice"--New York/North Jersey Chapter of the Engineering Management Society, 7:00 PM, Stevens Institute of Technology, Hoboken, N.J. **Reservations/Fee required for buffet.** Al Bottani (201) 265-7797.

**September 19--**"Advances In Reliability Prediction Of Electronic Equipment"--North Jersey Chapter Reliability Society, 7:00 PM, ITT Avionics Auditorium, 500 Washington Ave., Nutley, N.J. Henry Moss (201) 785-6458.

**September 20--**"Design Considerations For Multiprocessor Operating Systems"--North Jersey Section Joint Computer/Communications/LEO Chapter, 8:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. **Reservations required for pre-meeting dinner.** Dave Perry (201) 325-8415.

**September 21--**"Quasioptical System Design For Millimeter Wavelengths"--North Jersey IEEE MTT-AP Chapter, 7:30 PM, ITT Auditorium, 500 Washington Ave., N.J. **Reservations required for pre-meeting buffet dinner at 6:00 PM.** Dick Snyder (201) 492-1207.

**September 26-Dec. 5--**"Seminar: Design Of Passive Microwave Components"--North Jersey Section, Tuesdays, 6:30-9:00 PM, ITT-Avionics Auditorium or Clubhouse, Nutley, NJ. John Baka (201) 455-8534 (Business Hours).

**September 27--**"IEEE North Jersey Section Systems, Man & Cybernetics Society, 6:00 PM, Bellcore, 6 Corporate Place, Piscataway, N.J. Dr. Michael Liechenstein (201) 471-0721.

**October 3--**"Tour Of Resource Recovery Facility"--North Jersey Section, IEEE Power Engineering Society, 7:00 PM, Warren County Resource Recovery Facility, Oxford Twsp., Warren County, N.J. **Reservations required.** Joseph L. Kane, Jr., (201) 455-8456.

**October 17--**"Workshop: Cost Effectiveness In Design"--North Jersey Section Reliability Society, 5:00 PM-9:30 PM, ITT Auditorium, Nutley, N.J. Hank Moss (201) 785-6458.

**October 18--**"Seminar: Network Synchronization"--IEEE Metropolitan Chapter Instrumentation & Measurement Society, 9:00 AM-4:00 PM, Radisson Hotel, Newark Airport. Jeannie Franklin (201) 964-6200.

**October 19--**"The System Error Budget"--North Jersey Section Control System Society, 7:30 PM, JCP&L Co., Route 24 and Punch Bowl Rd., Morristown, N.J. Dr. Bill Bigley (201) 757-1600, ext. 2334.

**October 19--**"Minimizing Downtime Of Electrical Distribution Systems"--North Jersey Section Industrial Applications Society, 6:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. **Reservations required for pre-meeting dinner buffet.** David Perry (201) 325-8415.

**November 11--**"Symposium: Protection of Equipment And Systems In Utility/Industrial Facilities From Lightning, Switching Surges And EMI"--North Jersey Section, Industry Application Society, 9:00 AM-12:30 PM, Secaucus Hilton. **Reservation/Fee required.** Vittal Rebbapragada (201) 265-2000, Ext. 3449.

**PLEASE POST**  
**Members and Non-Members Welcome**



PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS



One of the tables at the Annual Section Banquet held May 3rd at the Chanticleer in Millburn.  
*For additional Banquet photos see page 8.*

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SEPTEMBER, 1989

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**NEWSLETTER STAFF**  
Editor.....M.M. Perugini  
Business Manager.....A.M. Beattie

**Deadline for receipt of material** is the 1st of the month preceding the month of publication. All communications concerning editorial and business matters, including advertising, should be addressed to: The Newsletter, c/o Girard Associates, Inc., 6 Robert Terrace, Mt. Arlington, N.J. 07856 (201) 398-5524.

**REPORT ADDRESS CHANGES TO:**  
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445 Hoes Lane, P.O. Box 1331  
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(201) 981-0060

It is not necessary to inform the North Jersey Section when you change your mailing address. The NEWSLETTER and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.

**SECTION OFFICERS**  
Chairman..... Howard Leach, Jr.  
885-3530  
Vice-Chairman-1..... Raymond Sears, Jr.  
386-2259  
Vice-Chairman-2..... George Graul  
290-1128  
Treasurer.....David Perry  
325-8415  
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492-1207  
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Member-At-Large..... David A. Dietsche  
Member-At-Large.....George Pick  
Jr. Past Chairman..... Robert Sinusas

*The North Jersey Section Executive Committee meets the first Wednesday (except holidays and December) of each month at 7 PM. These meetings (held at ITT, 500 Washington Ave., Nutley, N.J.) are open to all members. Information on each meeting agenda is available from Richard Snyder, Section Secretary at (201) 492-1207.*  
*Elected Section Officers are listed above.*

Multiprocessor  
Operating Systems

The September 20, 1989 meeting of the North Jersey Section joint Computer/Communications/LEO Chapter will hear Peter Weyman of Prime Computer discuss "Design Considerations for Multiprocessor Operating Systems."

**About The Talk**  
There are several challenges posed to operating system designers faced with the task of developing multiprocessor system architecture. Key design trade-offs and approaches to meeting these challenges are discussed, for several hardware configurations.

Topics to be discussed include: the overall software structure of a multiprocessor operating system, memory management and coherence in the context of loosely coupled and tightly coupled systems, process scheduling, inter-process communication, synchronization and the application programming model.

CHAIRMAN'S CORNER

At the last Executive Committee meeting, a contribution was made to the Warren County Unit of the American Cancer Society in memory of Charlie Coulomb for his many contributions. Also, was informed by our Region 1 Director, Vic Zourides, that our contribution would be matched by Region 1 also as a tribute to the many voluntary efforts made by Charlie over the years. We thank Vic Zourides for his thoughtful consideration.

Anne Giedlinski, Chairperson of our Student Assistance Committee, states that future scholarship awards will be named in honor of Charlie Coulomb. She also said that Past Chairman Eugene Niemiec, has volunteered to take Charlie's place on the committee. Welcome back Gene!

Dave Perry, our Section Treasurer, has graciously offered to make copies of the ELECTRO Keynote Speaker video tape for interested members if they provide a blank VHS video tape. He is in the process of making a Section copy. If interested, Dave Perry can be reached at (201) 325-8415.

With September comes the annual IEEE elections and you should have received your ballots by now. If not, they should arrive any day. With the ballot will be biographical information as well as position statements by the candidates to help you make a decision. Generally, all of the candidates have had extensive IEEE involvement and are qualified to serve in the offices they seek.

However, from my own point of view which does not necessarily represent the view of the Executive Committee or the Section membership, the following candidates will be among my choices.

For President-Elect, Merrill Buckley will be my choice. He is a petition candidate with extensive service in the IEEE at many levels and has given a number of talks at our own PACE meetings. His position on portable pensions, salary compression, age discrimination, and other issues facing the working engineer, to my mind, make Merrill Buckley the best choice for President-Elect.

For Region 1 Director, my choice is Frank Schink. Frank, recently retired as Chief Electrical Engineer of the Port Authority of New York and New Jersey, was formerly the New York Section Chairman and the METSAC Chairman. Over the years he has worked closely with members of our Section. Just this year he was instrumental in locating an economist to speak at our very successful Careers Conference on April 29th. He has had a distinguished career as an electrical engineer and now, in retirement, has the time to devote to the leadership of Region 1. Because of these and other considerations, I believe Frank Schink is the best candidate for Region 1 Director.

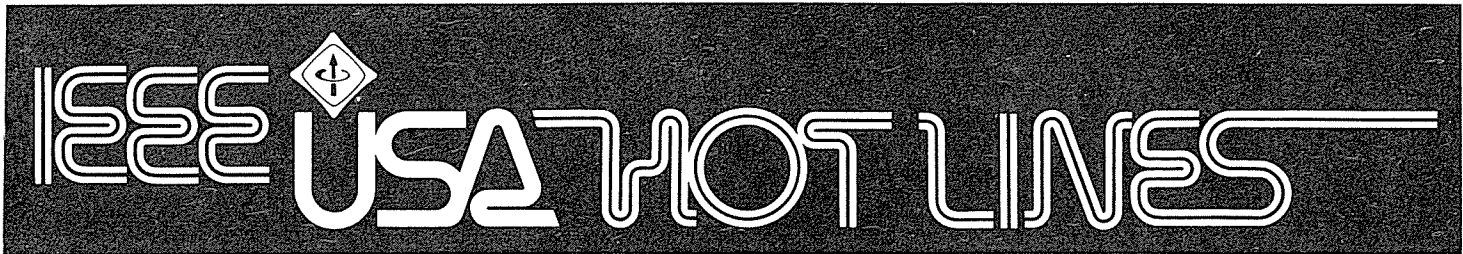
Again, I want to state that the above candidates are my own selections and do not necessarily represent the views of the Executive Committee or the North Jersey membership. Please make your selections and return the ballots. As only about 25 percent return their ballots overall, let's have a larger return rate in North Jersey!

HOWARD LEACH  
North Jersey Section Chairman

**About The Speaker**  
Peter Weyman is Director, Advanced Systems Development, for Prime Computer's Commercial Systems Group. He was the system architect for one of the Prime time sharing computers. He is presently directing R&D in multiprocessor system architecture and multiprocessing implementation of the UNIX operating system for multiprocessors using the 80486 and i860 microprocessor chip families.

**Pre-Meeting Dinner**  
There will be a pre-meeting dinner at the Ramada Inn, River Road & Route #3, Clifton, N.J. at 6:00 PM.

**Time:** 8:00 PM, Wednesday, September 20, 1989. (Pre-meeting dinner 6:00 PM.)  
**Place:** ITT Auditorium (under the tower), 500 Washington Avenue, Nutley, N.J.  
**Information/Reservations:** Dave Perry (201) 325-8415; Sven Sternung (201) 284-2111.



IEEE-USA Hot Lines is designed to provide IEEE Sections and Societies with up-to-date information on United States Activities.

IEEE-USA Office, 1111 19th Street, N.W., Suite 608, Washington, DC 20036, USA, (202) 785-0017

Joseph A. Edminister, Editor—Catherine S. McGowan, Associate Editor

**Congressional Fellows**—The United States Activities Board recently approved recommendations for two 1989–1990 Congressional Fellowships. Mr. Philip M. Paterno and Dr. Alfred E. Victor will take one-year leaves of absence to work in selected staff assignments on Capitol Hill. They will begin their Fellowships on January 1, 1990.

Mr. Paterno has been a district manager at AT&T since 1978. He is responsible for developing computer models to estimate and verify access expense from local exchange companies and for developing methods, computer tools, training and guidance for Bell System service costs groups.

Dr. Victor is program manager of the Joint Service Airborne Self-Protection Jammer at the Naval Air Systems Command in Washington, D.C. He manages the joint Navy-Air Force service's development, test and production of the Department of Defense's largest electronic warfare jammer for common application on tactical aircraft. He received his bachelor's degree in Naval Science from the U.S. Naval Academy, and his Master's and Ph.D. in Physics from Brown University.

Applications will be accepted until March 30, 1990 for the 1990–1991 IEEE-USA Congressional Fellowships. For more information on the program or for an application kit, contact the IEEE-USA Office in Washington, D.C.

**Electronics**—Seventy representatives of industry, government, academia and professional societies participated in a workshop in June to discuss the role of a U.S. dynamic random access memory (DRAM) initiative in revitalizing the U.S. electronics base. The attendees focused on the announcement of the formation of U.S. Memories, Inc. (USM). They endorsed the broad outlines of USM's DRAM initiative, endorsed establishment and support of similar ventures, and called on the U.S. government to respond affirmatively.

The workshop, convened by IEEE-USA, was the second held to discuss a national initiative for electronics industries. According to a consensus statement delivered to Capitol Hill after the workshop, the USM initiative is required, "if the United States is to reestablish a strong technology and manufacturing base." USM's and other initiatives can provide significant American-owned, controlled and secure sources of supply of DRAMs; can provide additional markets for the semiconductor manufacturing equipment sector; and can complement the overall efforts and contributions of SEMATECH, the semiconductor manufacturing industry consortium.

The group called on government to support industry-led initiatives for dual-use (civilian and military) technologies by providing an environment and incentives that are economically attractive and reduce risks to U.S. participants.

**Careers Conference**—"Engineers and Engineering Managers—Career Challenges of the 1990s" is the theme of the sixth biennial IEEE-USA Careers Conference, to be held at the TradeWinds Hotel in St. Petersburg, Florida, from November 1 through November 3. This two-and-a-half-day Conference will be sponsored by IEEE-USA's Career Maintenance and Development Committee.

This year's Conference will address such topics as the competitive environment for engineering in the 1990s; a comparison of U.S. and Japanese engineering careers; the impact of restructuring and new organizational structures on engineering careers; career transitions; and engineering productivity, among others.

The cost of the Conference is \$225 for members and \$300 for nonmembers. However, if you register before October 2, the cost will be \$175 for members and \$250 for nonmembers. The registration fee includes admission to all sessions, an opening reception, two lunches, all breaks, and a *Conference Record*. For more information or to register, contact the IEEE-USA Office in Washington, D.C.

**Awards**—The United States Activities Board recently announced the recipients of 1989 IEEE-USA achievement awards:

- Distinguished Public Service—Erich Bloch, Director of the National Science Foundation, for his efforts to enhance the understanding and status of engineering and technology on a Federal level.
- IEEE-USA Citation of Honor—William W. Middleton, for enhancing the IEEE-USA Awards program; John J. Miller, for originating, developing and documenting leadership in Section organizations, and training initiatives; and Ralph W. Russell, II, for attracting member support for state legislative programs and precollege math and science education programs.
- Regional Professional Leadership Award—Michael R. Andrews (Region 6), for developing precollege math and science education programs for students and teachers in the Phoenix, Arizona, area; Mark H. Arndt (Region 6), for his ongoing efforts in Washington state to increase the public's awareness of nuclear energy; Peter Bergsneider (Region 6), for developing a coalition of city government, local industry, local schools, parents and children to operate a Young Scientists and Engineers program in Fort Huachuca, Arizona; Carl K. Kintzel (Region 4), for his dedication to local and Regional congressional activities in Region 4; and Wallace A. Skelton (Region 2), for planning, publicizing and supporting career development workshops and presentations in Region 2.
- Professional Achievement—Walter Bury, for providing IEEE leadership in the Missouri Science Olympiad and for his efforts to establish an intersociety legislative group in the Kansas City area; Bernard H. Manheimer, for his activities related to environmental quality, energy and man-machine systems; and John E. Spencer, Jr., for promoting engineering awareness at Alabama's local political level.

Nominations are open until March 15 for IEEE-USA Awards for 1990. Other awards presented by IEEE-USA include awards for Distinguished Contributions to Engineering Professionalism and Divisional Professional Leadership, as well as two literary contributions awards. For information, award descriptions and nomination forms, contact the IEEE-USA Office in Washington, D.C.



## IAS Seminar On Equipment And Systems Protection

On November 11, 1989 the North Jersey Section Industrial Application Society will present a panel symposium consisting of four presentations covering the primary area of concerns to the electrical engineer. The chairman and moderator will be R.V. Rebbapragada, P.E., Chairman, IAS/North Jersey Chapter.

The presentation topics will be given by speakers (to be announced later) with extensive design experience having worked on several utility and industrial installations.

1. Nature and source of lightning and switching surges.
2. Lightning protection design considerations.
3. Protection of control and instrumentation circuits from switching surges.
4. Shielding and grounding of sensitive instrumentation circuits from EMI/RFI.

These in-depth talks will be presented on Saturday, November 11, 1989 starting at 9:00 AM and ending by 12:30 PM. The location is the Secaucus Hilton.

Cost for this complete technical discussion, including the luncheon is as follows: \$90 Non-Members; \$60 Members; \$35 Students.

In order to provide the presentation at this price, reservations with a \$30 per person deposit should be made by October 10, 1989. The remainder will be accepted at the door. Check or money order for the deposit should be made payable to "IEEE North Jersey Section" and sent to Mr. David P. Perry, Treasurer, IEEE North Jersey Section, 57 Forest Hill Rd., West Orange, NJ 07052, (201) 325-8415.

Coffee and danish will be served before the talks commence and coffee will be available throughout the morning. A buffet luncheon will be served immediately following the seminar break to offer an opportunity for people to get together to discuss various side issues at length.

**Time:** 9:00 AM-12:30 PM, Saturday, November 11, 1989.  
**Place:** Secaucus Hilton.  
**Further Information:** Vittal Rebbapragada (201) 265-2000, ext. 3449.

## IEEE New York, North Jersey and Long Island Joint Chapter Instrumentation and Measurement Society Presents a NETWORK SYNCHRONIZATION SEMINAR

Wednesday, October 18, 1989 — 9:00 AM-4:00 PM  
Radisson Hotel at Newark Airport

As private and public digital networks increase in size and complexity, the need for precise synchronization has become a critical requirement. The proliferation of T1, T3, DDS, and the approach of ISDN has created problems, not only for the carriers, but also the digital communication users and the equipment producers. This seminar will provide an overview of the problems, solutions, implementation and measurements for both the large and small networks.

Formal presentations of frequency and time synchronization in digital networks will be made. The program will cover such areas as clock distribution, typical field sync problems, slip concepts and testing, and analysis of performance.

The selection of proper equipment and synchronization techniques will be discussed, along with primary reference clock strategy.

A panel of industry experts will join with the speakers to respond to questions submitted by the attendees. Particular questions and topics can be submitted prior to the seminar.

Space will be limited and early registration is urged to guarantee attendance at this very important seminar.

### Registration and Information Contact:

Jeannie Franklin, Friedman Associates, Inc.  
(201) 964-6200 Fax: (201) 964-6204

**Fee:** IEEE Members: \$75.00; Non-Members: \$95.00. (Lunch is included.)

### To Guarantee Registration:

Complete and return registration form with check made payable to:  
IEEE NY, North Jersey & LI Joint Chapter.

### Hotel Accommodations:

A limited number of rooms are available at the Radisson Hotel at a rate of \$110.00 per night for registrants.

### Registration for "Network Synchronization Seminar"

**To:** Jeannie Franklin, Friedman Associates Inc., 2424 Morris Ave., Union, NJ 07083.

Name \_\_\_\_\_ IEEE No. \_\_\_\_\_

Company \_\_\_\_\_ Phone No. \_\_\_\_\_

Address \_\_\_\_\_

Please enclose required fee made payable to "IEEE NY, No. Jersey & LI Joint Chapter"

## Fiber Optic Sensors

On September 12, 1989 the IEEE North Jersey Section Industrial Applications Society will host a presentation on "Fiber Optic Sensors." The speaker will be Vittal Rebbapragada, P.E., of Burns and Roe Company.

### About The Talk

Mr. Rebbapragada's presentation is on the application of Fiber Optic Technology in the areas of sensors to measure such parameters as magnetic/electric fields, current, voltage, temperature, pressure, etc. It will cover the sensor mechanizations, types of sensors, practical applications, advantages and the limitations of technology.

### About The Speaker

Vittal Rebbapragada is the Chairman of IAS, North Jersey Section and is employed at Burns and Roe as Manager of Electrical Projects. He is a member of the Power Engineering, Industrial Application, and Instrumentation and Measurement Societies of IEEE and has given technical presentations on topics of interest in the area of Utility/Industrial Applications

### Dinner Buffet

There will be a dinner buffet preceding the meeting. Reservations required (RSVP below).

**Time:** 6:00 PM, Tuesday, September 12, 1989.

**Place:** ITT Auditorium (next to the tower, use rear door), 500 Washington Ave., Nutley, N.J.

**Further Information/Reservations:** David Perry (201) 325-8415.

## Advances In Reliability Prediction

The North Jersey Chapter of the Reliability Society will meet on September 19, 1989 to hear a talk entitled "Advances In Reliability Prediction Of Electronic Equipment." The speaker will be Dr. Michael Pecht of the University of Maryland.

### About The Talk

The use of reliability predictions in the design and operation of electronic equipment has been an evolutionary process. Dr. Pecht will discuss some of the new advancements, critical challenges, and unique opportunities in reliability prediction. These include:

- the Westinghouse Electronics and the University of Maryland study to update the prediction models for advanced microelectronic devices for MIL-HDBK-217E,
- the sources of variability contributing to life time and failure date,
- stochastic versus mechanistic methods for reliability prediction modeling.

In addition, if time permits, Dr. Pecht will discuss some recent advances in

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design for reliability in the areas of placement, Steiner tree routing, component stiffening effects on PWB's, corrosion, and via fatigue.

### About The Speaker

Michael Pecht is an Associate Professor who holds a joint appointment in the Mechanical Engineering Department and Systems Research at the University of Maryland. He is also the Director of the University of Maryland Computer Aided Life Cycle Engineering (CALCE) Center which deals with reliability issues in the design of electronic equipment. Dr. Pecht is the Editor of the *IEEE Transactions on Reliability*. He has earned an MS degree in Electrical Engineering, and MS and PhD degrees in Engineering Mechanics from the University of Wisconsin.

### Free Buffet

A free buffet will be provided starting at 6:00 PM, on a first-come-first-served basis.

**Time:** 7:00 PM, Tuesday, September 19, 1989. (Buffet starting at 6:00 PM.)

**Place:** ITT Avionics Auditorium, 500 Washington Avenue, Nutley, N.J.

**Further Information:** Henry Moss (201) 785-6458.

## Chaos Theory In The Vasculature

On September 13, 1989, the Metropolitan Chapter of the Engineering in Medicine and Biology Society meeting will feature "The Meaning Of Chaos In The Vasculature." The speaker will be Dr. Gary Drzewiecki, Research Assistant Professor at the Department of Biomedical Engineering, Rutgers University.

The application of nonlinear dynamical studies to the cardiovascular system is a growing area of research that is offering a fresh look at current problems. A review of such topics as chaos theory applied to ventricular fibrillation and heart rate variation and fractals applied to structure of the pulmonary vasculature and the coronary circulation, will be provided. Recent work by the speaker illustrates the conditions for chaotic flow in the coronary circulation which may lead to certain forms of coronary disease. The physiological implications of these phenomena will be discussed.

### Optional Pre-Lecture Get Together

There will be an informal pre-lecture get together 6:30 PM in the Tower cafeteria.

**Time:** 7:30 PM, Wednesday, September 13, 1989.

**Place:** Rockefeller University, Tower Bldg., Room 305, York Ave. at 66th St., NYC.

**Further Information:** Vijay Kowtha (201) 932-4803; Joe Bogovic (212) 241-8032 Robert Heyman (914) 357-1230; Edna Feher (212) 757-0610.

## Public Systems Modeling

On September 27, 1989 the IEEE Systems, Man & Cybernetics Society of New Jersey will host a presentation on "Public Systems Modeling: A Welfare Time-Series Model." The speakers will be Drs. Fred and Valerie Englander. This will be the first of a series on public systems modeling.

### About The Lecture

One of the issues that has puzzled policy makers responsible for anti-poverty policy since the 1930's is whether the poor are "rational" in the sense that they respond predictably to changes in program and labor market incentives and disincentives that affect their economic independence. Towards a partial test of this rationality hypothesis, Drs. Englander examine a particular behavior of welfare clients--their inclination to respond to an adverse decision of the welfare bureaucracy by filing a "due-process appeal." The presentation will elaborate a time-series regression model that the Englanders have developed to test whether the number of such appeals in a given month is systematically related to welfare program and labor market variables that measure the cost and benefits to those filing appeals.

### About The Speaker

Dr. Fred Englander is a Professor of Economics at Fairleigh Dickinson University and Dr. Valerie Englander is an Associate Professor of Economics at St. John's University, both having obtained their PhD's at Rutgers in 1975. Fred serves on the editorial board of SJU's *Review of Business* and the *Public Admin. Quarterly*. Both have numerous professional publications in the areas of public assistance programs and program evaluation.

### Pre-Meeting Dinner

There will be a pre-meeting dinner following the meeting (RSVP below).

**Time:** 6:00 PM, Wednesday, September 27, 1989.

**Place:** Bellcore, 6 Corporate Place, Piscataway, N.J. (Lobby Area: Bldg.-A; Map available on request.)

**Information/Reservations:** Dr. Michael Liechenstein (201) 471-0721.

## Calling All Associate Members!

It's time to advance to member or Senior Member grade. The dues are the same for all three grades so apply for the highest grade for which you are qualified.

For information and a Member and/or Senior Member application, contact Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, N.J. 07605 (201) 461-0900, ext. 238.

# Quasioptical Techniques For Transmission

The September 21, 1989 meeting of the North Jersey IEEE MTT-AP Chapter will feature "Quasioptical System Design For Millimeter Wavelengths." The speaker will be Dr. Paul F. Goldsmith from Five College Radio Astronomy Observatory.

## About The Talk

Quasioptical propagation is gaining increasing acceptance as a valuable transmission medium for millimeter wavelengths. The reasons for this include the low loss, broad bandwidth, multiple polarization handling, and large range of circuit functions that can be obtained. A wide variety of radar and radiometric systems and subsystems have been developed using quasioptical techniques. Quasioptical systems depend on availability of building blocks or components for carrying out particular functions. Some of these are quite similar to waveguide approaches used at longer wavelengths, and some derive from infrared and optical technology.

The relatively large (compared to optical) wavelength means that for compact systems, diffraction is an important consideration. Nevertheless, quasioptical techniques are continuously being extended to perform new tasks as well as being refined to occupy less volume. Recent developments include a system for high accuracy measurements of materials properties, quasioptical tuning elements for a frequency multiplier, and analysis of power combiners using a free space resonant cavity.

Quasioptical propagation using Gaussian beams (Gaussian optics) has been the basis of most system design employing free space transmission. The relative simplicity and comprehensiveness of the theory allows accurate and efficient calculations of the performance of many components.

Critical questions then are:

1. In what situations is Gaussian optics the optimal choice of propagation medium?
2. How is the Gaussian optics portion of a complete system interfaced to the parts using other transmission media?
3. How is system design using Gaussian optics carried out?

This talk reviews the basics of Gaussian beam propagation, and the Gaussian optics components which have proven especially useful. Guidelines for the use of different components and their integration into systems are also developed to aid the designer in assessing the utility of Gaussian optics and examples of quasioptical systems are also presented to illustrate the design principles.

## About The Speaker

Paul F. Goldsmith was born in 1948 and received his undergraduate and graduate training at the University of California, Berkeley. His doctoral research involved the development and use of the 230 GHz radiometer for observation of emission from carbon monoxide molecules in interstellar clouds. After completing his PhD degree in 1975, he received an appointment as Member of the Technical Staff at Bell Telephone Laboratories, Holmdel, N.J., where he developed instrumentation for the 7m antenna used for radio astronomical observations. In 1977 he was appointed Assistant Professor at the University of Massachusetts at Amherst, in the departments of Physics and Astronomy and Electrical and Computer Engineering. He has been actively concerned with the development of low noise receivers and other equipment for the 14m radome-enclosed radio telescope operated by the Five College Radio Astronomy Observatory, as well as using this instrument to study the composition and structure of molecular clouds in the interstellar medium of our Galaxy. His work in the area of receiver systems for millimeter and submillimeter wavelengths has led to ongoing interest in quasioptics--the application of optical techniques to these relatively low frequencies. Dr. Goldsmith is presently professor of Physics and Astronomy at the University of Massachusetts, and Associate Director of the Five College Radio Astronomy Observatory. In 1982 he was one of the founders of the Millitech Corporation, a company dedicated to design and production of millimeter and submillimeter components and systems, where he is Vice President for Research and Development. Dr. Goldsmith is a member of the American Astronomical Society, Sigma Xi, USRI, SPIE, and a Senior Member of IEEE.

Members and guests interested in this topic are invited.

## Free Buffet Dinner

There will be a free buffet dinner for attendees in the lobby at 6 PM. **Reservations for the complimentary dinner are requested.**

**Time:** 7:30 PM, Thursday, September 21, 1989. (Pre-meeting buffet dinner at 6:00 PM. **Reservations required.**)

**Place:** ITT Auditorium (at the tower), 500 Washington Ave., Nutley, N.J.  
**Information/Reservations:** Dick Snyder (201) 492-1207; Willie Schmidt (201) 284-2255.

# Motivating The Engineer

The New York/North Jersey Chapter of the Engineering Management Society will hold a September 18, 1989 meeting on "What Motivates Engineers?: Understanding Employee Motivation—Theory And Practice." The speaker will be Jerome Siegel, PhD, Professor in the Department of Psychology at the City College of the City University of New York.

## About The Talk

Dr. Siegel's talk will cover some of the most commonly accepted theories of motivation as applied to the engineering work situation. Also discussed will be managerial strategies for implementing some of these theoretical notions. In particular, managerial motivation techniques in a project-oriented, technological environment, will be emphasized. If time allows there will be a question and answer period and informal discussion of the topic.

## About The Speaker

Dr. Siegel has been with the Department of Psychology since 1971. His consulting over the last 20 years encompasses large and small organizations in the public sector, including AT&T, Citiband, American Management Association, National Science Foundation, Southern Container Corporation, Zerox, and the NY City Police and Fire Departments. Services have included human resources implementation of training programs, test validation projects, management development, employee attitude surveys, and human factors.

Dr. Siegel received his PhD from New York University in 1963. His undergraduate work was at City College, where he majored in Psychology. He is past president of the Human Factors Society.

## Buffet Reservations

A buffet priced at \$7.00 will precede the meeting starting at 6 PM. **Reservations for the buffet are required by September 12, 1989.**

All Engineering Management Society members and non-members are welcome.

**Time:** 7:00 PM, Monday, September 18 1989. (Buffet starts at 6:00 PM.)

**Place:** Stevens Institute of Technology, Hoboken, N.J.  
**Information/Reservations:** Al Bottani (201) 265-7797; Deborah Kezsom (201) 871-1640.

# PACE NEWS

By R. Tax

When you keep hearing the same song over and over again, no matter how ridiculous it sounds, it is sometimes difficult to keep from humming a few bars. I must confess that I fell into the trap just recently and found myself humming an overplayed tune. I have heard so much about the shortage of elementary and high school teachers for mathematics and science that I actually believed it. And, I have heard about these shortages from members at our past PACE Conferences.

I thought this might offer alternate career paths for some of our engineers that have been displaced by the cutbacks. In hope of helping some of our members make the transition smoothly from engineering to teaching, I called the Department of Education for the State of New Jersey. I spoke to the Coordinator for the Provisional Teacher Program only to find that we do not have a shortage of these math and science teachers.

This song is and has often been sung by members of various IEEE boards and committees. I wonder how many of them have actually contacted the Department of Education in their states to verify the situation. I believe its about time we did some checking since IEEE activities, budgets and decisions are being influenced by this tune. If the shortage is not real then some adjustments should be made in our activities, our budgets and our decisions.

Meanwhile, I was assured that our engineering members may still compete for teaching positions through the Provisional Teacher Program. Further information will be reported as it is made available. If you are interested in hearing a guest speaker from the Department of Education discuss this further, please contact me.

## PACE CONFERENCE

The 1989 PACE Conference is being held at Burlington, Vermont, during the Labor Day weekend. The three-day conference is packed with issues of significant importance to our members. Following is a list of the subjects:

IEEE-USA Legislative Alerts - Influencing the Future Industry Outlook

Employment Matters - Unemployment, Underemployment and Successfully Employed

National Engineers Week

Pensions - Early Retirements - Age Discrimination

Judging by the choice of subjects, other members of the IEEE are experiencing some of the problems of the profession.

A report and discussion about the Conference will take place at the Section PACE meeting on Thursday, September 14th. See PACE meeting notice in this issue.

## PROFESSIONAL ACTIVITIES

One of our members reported that Civil Service jobs for engineers can be found by going to the Civil Service Commission in Newark, N.J. Other jobs might be found by going to the Personnel Department of any Military Base or Government facility. Thank you for the information.

Students and recent Grad's with EE degrees - we are aware of the problems finding Engineering jobs. If you are one of the victims of the low demand for engineers, your PACE committee would like to help. We know of cases where young engineering graduates are working as painters, sheet rock installers, and doing non-engineering counter sales at clothing stores and at Radio Shack. These are NOT engineering jobs.

Our PACE meetings ar dedicated to our membership. If you have problems, solutions or issues of a professional nature, please bring them to our monthly PACE Meeting or send any information to Richard Tax, 630 Montview Place, River Vale, NJ 07675 or call (201) 664-6954.

# PACE Committee Meets Monthly

The PACE Committee meets on the second Thursday of every month at the ITT Auditorium, 500 Washington Avenue, Nutley, N.J. (near the the ITT Tower) at 7:30 PM. Our Section Executive Committee meets there on the first Wednesday of every month (except in December) at 7:00 PM. Any questions or comments will be well received. Contact Richard Tax at (201) 664-0803 (after 7:00 PM) or write to R. Tax, 630 Montview Place, River Vale, N.J. 07675.

# Engineering In Medicine & Biology News

The joint Long Island, New York and North Jersey Chapter of the Engineering in Medicine and Biology Society has been in existance for many years. This is an interactive group with varied interests as is typical of the society represented. The aim of the society is to keep members abreast of the developments in general Biomedical Engineering with quality speakers with detailed background in their respective areas.

The main concerns to be addressed is the continuing education for professionals, and how to motivate the general audience with increased feedback to make the seminars that much more enjoyable.

The Engineering in Medicine and Biology Society is a fairly active society with a detailed seminar series going back over the last twenty years. Every year about nine lectures are scheduled starting from September through May on issues concerning Biomedical Engineering.

The seminars are held on the second Wednesday of every month at 7:30 PM, with a general informal gathering at 6:30 PM. They are held at the Tower Building, Room 305, Rockefeller University, NYC. The Society is extremely lucky in having this meeting place which is convenient to members from the surrounding areas ranging from New Jersey to Long Island, and Westchester to Brooklyn. Moreover, there is free parking space available at an extremely great location in the city.

In the last year there have been lecture topics such as: engineering principles of the ear and hearing aids; ultrasound tissue characterization; an engineering approach to Diabetes; new techniques in cardiac instrumentation; principles in medical imaging; among others.

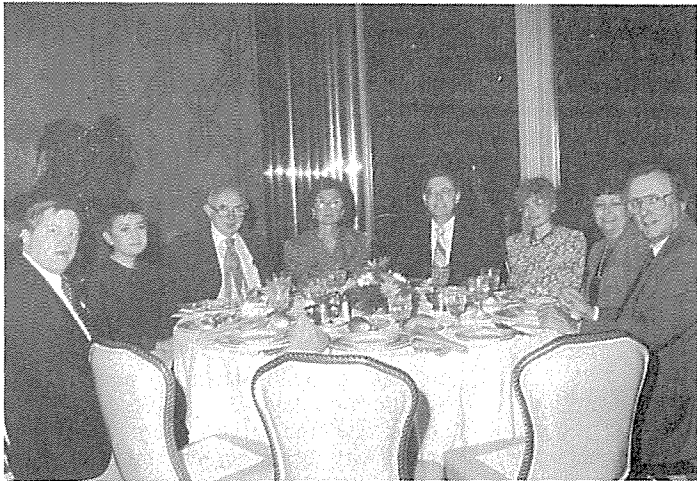
The first annual Biomedical Engineering conference was a tremendously successful program. The evening comprised both student presentations and guest presentations from Professionals in nearby industry. It was a combination of the labor of the graduate students and their advisors who have helped them all along, that has made the student presentations enjoyable. It is hoped to continue this conference on a yearly basis and one is in the planning stages for May 1990.

The Society is soliciting newsworthy articles from Professional Engineers. Input is also appreciated on the type of seminars members would like to attend, speakers who can communicate effectively and topics for specialized symposia by leading researchers in the field. Please contact the following people with your suggestions and comments or to receive information:

Vijayanand C. Kowtha, Chairman	
217 E. 7th Street 7G, Brooklyn, NY 11218	(201) 932-4803
Joe Bogovic, Vice Chairman	(212) 241-8032
Richard Heyman, Secretary	(718) 898-8620
Edna Feher, Member-at-Large	(212) 757-0610
Ben Caref, Past Chairman	(718) 270-1712



At The ANNUAL SECTION BANQUET  
May 3, 1989



PACE Meeting:  
OPPORTUNITIES FOR EXPERIENCED ENGINEERS

The North Jersey Section's Professional Activities Committee for Engineers will meet on Thursday, September 14, 1989. The meeting will feature a presentation entitled "Management, Executive Functions And Entrepreneurial Activities." The guest speaker, Steven J. Rebovich, will address the three most common types of business organizations: sole proprietorship, the partnership, and the corporation. He will discuss the advantages and disadvantages of each and their roles in the American Economy.

Steven Rebovich is a successful engineer and business executive. He has a BSEE degree from Polytechnic Institute of New York, in Farmingdale. Steve was employed by Hazeltine Corporation and Interactive Networks before starting his own company Netways Incorporated. His most recent activities were in OEM sales and marketing for Raycom Corporation, a subsidiary of 3M and Corning Glass. He is currently a consultant to both engineering and management with VSR International.

Mr. Rebovich has also served the membership of IEEE in his capacity as Chairman of the Long Island Section and as the Secretary of the Metropolitan Sections Activities Council (METSAC).

All IEEE members and guests are invited to attend. Refreshments will be served.

Time: 7:30 PM, Thursday, September 14, 1989.  
Place: ITT Auditorium, 500 Washington Avenue, Nutley, N.J.  
Further Information: Richard Tax (201) 664-0803.

IEEE  
North Jersey Section Reliability Society  
Presents  
A WORKSHOP ON  
COST EFFECTIVENESS IN DESIGN

Tuesday, October 17, 1989 — 5:00 PM - 9:30 PM  
ITT Auditorium, 500 Washington Avenue, Nutley, N.J.

The workshop will examine a representative developmental design for cost coupled with the constraints of various Design disciplines such as Electrical, Mechanical and Environmental, Reliability, Maintainability and Logistics. The panel discussion members will include:

Henry Moss	Product Assurance Mgr.	Kearfott
Dan Sackett	Mechanical Engineering Mgr.	Kearfott
Charles Mertz	Systems Safety Mgr.	NASA
John Wronka	Reliability Engineer	AT&T-Bell Labs
Fred Embuscado	Maintainability Engineer	Texas Instr.

FEE: \$25 for IEEE Members; \$35 for Non-Members. (Fee includes proceedings and dinner). For more program information, contact Hank Moss (201) 785-6458.

Specific details for directions, parking, lodging, dinner and final program agenda will be provided upon receipt of the registration form and in future issue of the NEWSLETTER.

Registration "Workshop On Cost Effectiveness In Design"

To: Sergei Bogaenko, 32 Melissa Drive, Totowa, NJ 07512. Please make checks payable to: "North Jersey Reliability Society".

Name \_\_\_\_\_ Title \_\_\_\_\_

Affiliation \_\_\_\_\_ IEEE No. \_\_\_\_\_

Address \_\_\_\_\_

Phone No. \_\_\_\_\_

Tour Of Resource  
Recovery Facility

The October 3, 1989 meeting of the North Jersey Section, IEEE Power Engineering Society will feature a tour of the Warren County Resource Recovery Facility. This is a state-of-the-art resource recovery system dedicated on September 28, 1988. It can burn 400 tons of refuse per day and generate 13.5 megawatts of electric power, enough for over 10,000 households.

This facility meets all of New Jersey's strict air quality standards through the use of a scrubber and a baghouse.

Reservations Required

Tour attendance is free, but telephone reservations must be made due to limited tour facilities. For reservations, please call: Joseph L. Kane, Jr., (201) 455-8456.

Time: 7:00 PM, Tuesday, October 3, 1989.

Place: Warren County Resource Recovery Facility, Oxford Township, Warren County, N.J.

Reservations/Information: Joseph L. Kane, Jr., (201) 455-8456.

Directions: Take Route 78 West to Exit 16. Take Route 31 North. The facility is one mile South of Route 46, on the left hand side.

Transformers And  
Switchgear

On October 19, 1989 the IEEE North Jersey Section Industrial Applications Society will host a presentation on "Minimizing Downtime Of Electrical Distribution Systems." The speaker will be Edward R. Muchmore.

About The Talk

The presentation will pertain to Transformers and Switchgear. Areas to be covered will include upgrade of your equipment, retrofits to existing switchgear, or "when all else fails and you are down."

About The Speaker

Edward R. Muchmore is a Vice President of Emerson Power, Inc. For 35 years, he has solved problems for industrial and utilities, with regard to the distribution of electrical power, dealing with switchboards, switchgear, substations, and protective relays and controls.

Dinner Buffet

There will be a dinner buffet preceding the meeting. Reservations required (RSVP below).

Time: 6:00 PM, October 19, 1989.

Place: ITT Auditorium (next to the tower, use rear door), 500 Washington Ave., Nutley, N.J.

Further Information/Reservations: David Perry (201) 325-8415.

IEEE

North Jersey Section Seminar

DESIGN OF PASSIVE MICROWAVE COMPONENTS

Tuesdays, September 26 - December 5, 1989 - 6:30 to 9:00 PM

ITT-Avionics Auditorium or Clubhouse, Nutley, N.J.

The North Jersey Section is offering an evening course titled "Design of Passive Microwave Components." The course is designed for those graduate EE's who have taken the IEEE Introductory Microwave Component Design course (or the equivalent), and who are working in the microwave design field. The course will go into depth in the particular combination of electromagnetic and network theory that is required for efficient passive (and for that matter, active), microwave component design. Design problems will be assigned each week. Familiarity with PC usage is helpful but not required; however, the student will use matrix combination in the design process. Equivalent circuits will be developed that will be both network and E-M based. These will form the basis for the various designs of filters, couplers, ferrite and other non-reciprocal devices and power splitters. Design philosophy will cover the frequency range from 1 MHz well into the millimeter region.

The instructor is Dr. Richard V. Snyder, President of RS Microwave (201) 492-1207.

- (1) September 26 - Review of electromagnetic waves theory, including temporal and special field variations as applicable to the "innards" of components.
- (2) October 3 - Scattering and other linear matrices, including mathematical theory and application to characterization of resonators, obstacles and structures.
- (3) October 10 - Chaining and cascading multiport networks. Application of equivalent circuit principles to lumped and distributed situations. Local equivalent circuits. Lumped networks coupled with field variables.
- (4) October 17, (Clubhouse) - Filter design from the lumped equivalent circuit point-of-view. Network transformations.
- (5) October 24 - Filter design from the distributed circuit point-of-view, including combination of lumped and distributed variables. Principles of optimization applied to filter design.
- (6) November 7 - Evanescent mode components, effects of dissipation, various printed structures. More optimization.
- (7) November 14 - Multiplexing. Common junction combinatory techniques, including crossover at less than 3 dB points.
- (8) November 21, (Clubhouse) - Coupled line principles. Directional couplers hybrids, power dividers, magic tee, quadrature couplers, etc. Lumped and distributed versions of various coupled structures.
- (9) November 28 - Principles and equivalent networks for various ferrite and other non-reciprocal devices, including the principles of active circulators.
- (10) December 5 - Review and Question week (topics of the day).

**Texts:** 1. Class notes handed out each week. 2. *Microwave Filters, Impedance-Matching Networks, and Coupling Structures*. Matthaei, Young and Jones, Artech Books (Included as part of registration cost)

**Other References:** (Not included in cost). 1. *Notes on Microwave Circuits*, Vol. 1, Darko Kajfez, University of Mississippi. 2. *Microwave Circuits*, Altman, Van Nostrand. 3. *Microwave Engineers' Handbook*, Vol. 1 & 2, Artech Books. 4. *Optimum Seeking Methods*, Wilde, Prentice-Hall. 5. *An Introduction to the Finite Element Method*, J.N. Reddy, McGraw-Hill.

Class Size will be limited to 35 maximum. The course will not be held until receipt of 15 registrations.

**Where:** ITT-Avionics Auditorium or Clubhouse, Nutley, N.J.

**When:** Ten (10) sessions, Tuesday nights, starting September 26, 1988 from 6:30 PM to 9:00 PM. Coffee will be provided.

**Cost:** IEEE Members \$200 (registration by Sept. 1). Non-IEEE Members \$275 (registration by Sept. 1). Texts 1 & 2 above, included in the cost.

**Late Fee:** \$25 (registration by Sept 12).

**Contact:** Mr. John A. Baka at (201) 455-8534 during business hours.

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Registration "Design of Passive Microwave Components"

To:Mr. John Baka, Distribution Engineering, Jersey Central Power and Light Company, Madison Ave. at Punch Bowl Rd., Morristown, N.J. 07960

Name \_\_\_\_\_ IEEE No. \_\_\_\_\_

Affiliation \_\_\_\_\_ Phone No. \_\_\_\_\_

Address \_\_\_\_\_

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Please enclose required fee made payable to "North Jersey Section IEEE"

Intersociety

News

by  
Dave Perry

INTERSOCIETY COMMITTEE

The Intersociety Committee was established in 1988 for the purpose of promoting activities of common interest with other engineering and scientific societies.

Subjects thought to be of common interest are technical subjects that cross the lines of technology, such as engineering and scientific PC applications for which a conference is being planned in 1990 (reported elsewhere in the Newsletter) and a conference also for 1990 which will deal with the subject of career management.

In the case of both conferences, we are seeking broad support from other societies so as to make the conferences as interesting as possible and to promote cross fertilization of ideas.

In 1987, the Computer/Communications Chapter sponsored a two-day conference on R&D Small Business Opportunities. The conference was a technical success and while we were able to find about fourteen other cooperating societies, financial sponsorship with fourteen societies would have entailed considerable administrative time to prepare the necessary forms.

So the cooperating societies came in with some publicity, but not to the extent that they would have if they had had a financial stake in the outcome.

Some of the people on the conference planning committee foreseeing prospects of future intersociety activities felt that an umbrella society should be created to help solve this problem. With this in mind, in 1988 some of the members of the conference organized United Societies of Engineering & Science of New Jersey, Inc. (USES-NJ) and have begun to apply for tax-exempt status from the IRS.

Seed money (\$50) for the formation of USES-NJ was contributed from the budget of the Intersociety Committee, from ASME, Society of Experimental Mechanics, NJIT, Stevens Institute, and Optical Society of America.

Our committee hopes that USES-NJ will benefit the IEEE and the North Jersey Section by running useful programs that will attract new members to IEEE, bring knowledge to IEEE members about technical subjects from other professional areas and help promote engineering and science in professional areas.

For more information write: David P. Perry, Intersociety Committee, 57 Forest Hill Road, West Orange, NJ 07052, or phone (201) 325-8415.

Computer/Communications/ LEO Chapter

FUTURE MEETING TOPICS

Future Computer/Communications/LEO programs for 1989-90 will deal with a variety of topics. With the cooperation of members of several other professional societies (such as the Optical Society of America, The Institute of Management Science, Operations Research Society of America and ASME), members of the Joint Computer/Communication/LEO Chapter are planning a one day conference called **United Societies Conference On Hi Tech PC Applications** for November 1990.

Topics for the conference will follow three tracks: Track 1 will deal with technologies such as Graphics, CAD/CAM, HDTV, network control, information distribution; Track 2 will deal with PC applications involving electo-optics, chemical engineering, bio-engineering, pharmacology and mechanical engineering; Track 3 will be the exhibits.

Members of other North Jersey Chapters assisting on the program committee are Dr. Liechenstein (Cybernetics/Man Machine), Dr. Pandey (Reliability), Dr. Bigley, (Control Systems), Dr. Whittaker (Lasers and Electo Optics) and Vittal Rebbapragada (Industrial Applications). Dr. Ruse (a past president of the Antennas and Propagation Society), has been helpful with suggestions about exhibitors.

Look for more information about the conference under the Intersociety committee report.

Look in the next issue of the Newsletter for an announcement of an October 18, meeting to be held at the ITT Auditorium, for members of LEO-36 and others interested in forming a separate chapter for next year. There will be a buffet dinner in the auditorium at 6:00 PM at \$10.00 per person. Reservations will be taken.

On October 25, the Chapter will continue with its series on communication protocols.

In the planning stages for the balance of the year are other topics relating to multiprocessing, PC Applications and subjects relating to software development.

System Design

Error Budget

On October 19, 1989 the North Jersey Section IEEE Control System Society will present a lecture entitled "The System Error Budget." The speaker will be Dr. Harris Rawicz, Chief Scientist at Lockheed Electronics Co. Inc., Plainfield, N.J. and Adjunct Professor at Kean College.

**About The Lecture**

The winning of a competitive program and the proper design of a system depends on the clarity and the comprehensiveness of the error budget. The error budget has to show the customer and your company's managers how to meet the system accuracy specifications with the least cost. The method presented here was developed several years ago and combines bias and random error propagation with sensitivity equations. It is performed using SuperCalc 4, although Lotus 123 and/or computerized spread sheet with graphing capability can be used. Examples of system designs and the resulting error propagation charts will show how systematic errors affect overall accuracy and how system tradeoffs can be made.

**About The Speaker**

Dr. Harris Rawicz received his BSEE and MSEE degrees from Newark College of Engineering, New Jersey Institute of Technology, in 1958 and 1961 respectively. In 1968 he received his DSc from Stevens Institute of Technology, majoring in automatic control theory and minoring in mathematics. In his engineering career at Lockheed, Dr. Rawicz developed the system architecture and design for the majority of the radar tracking and weapon pointing systems produced by Lockheed. His work encompasses a broad range of engineering disciplines from analog circuit design to multivariable control systems to conceptual systems analysis and design. His current research interests focus on advanced electro-optical tracking systems. Dr. Rawicz holds several patents and has published many papers.

**Pre-Meeting Dinner**

There will be a pre-meeting dinner at RODS, Madison Avenue, Morristown at 5:00 PM.

**Time:** 7:30 PM, Thursday, October 19, 1989.

**Place:** JCP&L Company, Route 24 and Punch Bowl Rd., Morristown, N.J.

**Pre-Meeting Dinner:** 5:00 PM, RODS, Madison Ave., Morristown, N.J.

**Information:** Dr. Bill Bigley (201) 757-1600, ext. 2334; Fred Schupan (201) 757-1600, ext. 2392.