The IEEE
Newsletter

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

PACE Meeting: Engineers And Their Future In The Profession

The North Jersey Section's Professional Activities Committee for Engineers will meet on Thursday, February 8, 1990. The purpose of the meeting is to provide you with the opportunity to meet with other engineers, increase professional contacts, and join us in planning future activities.

This meeting is for all members concerned about their future in engineering and the future of the corporations that employ engineers.

This is a perfect opportunity to utilize IEEE funds and resources to better serve our members needs. We are open to suggestions and would like your participation.

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

Time: 7:30 PM, Thursday, February 8, 1990.
Place: ITT Auditorium, 500 Washington Avenue, Nutley, N.J.
Further Information: Robert Sinusas (201) 228-3941.

Perceptual Transform Coding Of Stereo Signals

On February 13, 1990 the North Jersey IEEE Acoustics, Speech and Signal Processing Chapter will continue its series of technical talks related to current topics in signal processing. James D. Johnston of AT&T Bell Laboratories will be the featured speaker.

Free Buffet

A free buffet will be provided on a first-come-first-served basis an hour prior to the scheduled talk.

Time: 7:30 PM, Tuesday, February 13, 1990. (Free buffet at 6:30 PM.)
Place: AT&T Bell Laboratories, Murray Hill Auditorium, 600 Mountain Ave., Murray Hill, NJ
Further Information: John Burgess (201) 386-2736; Steve Laico (201) 386-2031.

A Statistical Approach To Failure Prediction

On February 15, 1990, the North Jersey Section Industrial Application Society will host a presentation on "Failure Prediction Of Components And System In Utilty/Industrial Plants." The speaker will be Dr. Alan J. McElroy, Ebasco Services Inc., New York City.

About The Talk

There has traditionally been a lot of uncertainty associated with estimating equipment and structural failure rates from limited data. Yet the importance of such estimates is beyond question when the equipment is expensive or the consequences of failure are severe. With recent advances in the application of mathematical statistics and in computer hardware capability, failure rate predictions have been improved sufficiently to permit application of optimization strategies. These include assigning automatic equipment replacement intervals even before failure occurs. The basis for improved predictions and for optimizing maintenance will be described and illustrated within the context of industry application.

About The Speaker

Alan McElroy has over thirty years of experience in the electric utility industry, the last ten of which has been spent pioneering a prediction technology based on time series analysis of failure related data. His most recent assignment involves modeling for predicting likelihood of failure of electrical distribution systems and rates of components in bridges and tunnels operated by New York City's Triborough Bridge and Tunnel Authority. He is a Fellow of the IEEE and in 1978 was awarded their Standards Medallion for his leadership role in IEEE Standard 500, the Nuclear Plant Reliability Data Manual.

He is an electrical engineer by training and in 1969 received his doctorate from MIT, with a major in statistical physics.

Pre-Meeting Dinner

The pre-meeting light buffet dinner starts at 6:30 PM prior to the technical presentation.

Time: 7:30 PM, Thursday, February 15, 1990. (6:30 PM, buffet dinner.)
Place: ITT Auditorium, 500 Washington Ave., Nutley, N.J.
Further Information/Reservations: Vittal Rebbapragada, Chairman, IAS Chapter (212) 839-2262, or Max C. Schramm (201) 887-1120.

Want To Reduce Your '89 Taxes And Plan For 1990?

If the answer is yes, plan on attending the New York/New Jersey IEEE Engineering Management Society and PACE joint meeting on February 20, 1990. Mr. Leslie A. Newson, C.F.P., C.P.A will discuss what you can still do to help reduce your 1989 taxes, as well as what you should be doing in the way of tax planning for the 1990's. Mr. Newson will also present a Financial Planning Overview. There will also be a question and answer period.

Mr. Newson is a partner with Newson & Haberman, C.P.A.'s. He received his BBA and MBA from Hofstra University and is a member of the American Institute of Certified Public Accountants, New York Society of Certified Public Accountants, International Board of Certified Financial Planners, as well as other financial associations.

The meeting will be well worth your time.

Time: 7:00 PM, Tuesday, February 20, 1990.
Place: ITT Auditorium, 500 Washington Avenue, Nutley, NJ
Further Information: Aldo A. Bottani (201) 265-7977.

FEBRUARY, 1990
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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.

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 David A. Dietsche, Section Secretary at (201) 579-1610.

Elected Section Officers are listed above.

CHAIRMAN'S CORNER

Welcome to the 1990s! As the first Chairman of the North Jersey Section privileged to serve you in the 1990s, I am looking forward to the opportunity to help establish directions for the Section which will enhance our professional and technical position during an era of change which is likely to be unprecedented in both its rapidity and geographical scope. Our profession, both the technologies we deal with and the way we do business, will be vastly different ten years hence. We, the members of the IEEE have the opportunity, if not the obligation, to participate in this change in the most constructive way possible.

Although "engineering jobs" in the traditional sense are scarce in our area, the needs for the services we can provide continue to grow and to change. The challenge we face is to turn these needs into viable business opportunities, individually, within emerging corporate environments, and professionally. We need to invent and engineer our business as well as the "widgets" on which it is based.

The Executive Committee and I need your participation in this endeavor and invite you to join us as active volunteers within our numerous committees and chapters. Those of you interested are invited to attend our Executive Committee meetings, normally the first Wednesday of each month at the ITT Auditorium in Nutley, or to contact a member of the Executive Committee. I can be reached during business hours at (201) 386-2259 to provide you with additional information. I am looking forward to meeting more of you and working with you during the coming months.

Raymond W. Sears, Jr.
North Jersey Section Chairman

System Component Protection

On April 19, 1990, the North Jersey Section Industrial Application Society will host a presentation on "Component Protection, Current Limitation And The National Electrical Code." The speakers will be Robert Denis and Stephen Norako, both are District Sales Engineers in the New Jersey area for the Bussmann Division of Cooper Industries.

About The Talk

The presentation covers proper protection of electrical system components. They will discuss how higher interrupting ratings have been misinterpreted and do not in themselves assure proper downstream protection. The topic of withstand rating is discussed. The presentation is concluded with the concept of current limitation as an effective means of assuring proper component protection.

About The Speakers

Robert Denis has been with the Bussmann Division of Cooper Industries for the past four years. Prior to that he was a sales engineer with the Brown Boveri Electric Inc. company. He holds a BSEE from the Polytechnic Institute of New York.

Stephen Norako has been with the Bussmann Division of Cooper Industries for the past seven years. Prior to that he was a sales engineer with the Electrical Equipment Group of GTE Sylvania, Inc. He holds a BSEE from Fairleigh Dickinson University.

Pre-Meeting Dinner

The pre-meeting buffet dinner starts at 6:00 PM and the presentation begins at 7:00 PM.

Time: 7:00 PM, Thursday, April 19, 1990. (6:00 PM, buffet dinner.)
Place: ITT Auditorium, 500 Washington Ave., Nutley, N.J.

Further Information/Reservations: Vittal Rebbapragada, Chairman, IAS Chapter (212) 839-2262, or Max C. Schramm (201) 887-1120.

Public Relations And The Consultant

On March 28, 1990, the IEEE NY Section Consultants' Network will feature a presentation on "Professional Visibility Through Public Relations" by public relations consultant Judi Hampton. After more than fifteen years representing large corporations and public agencies, Judi Hampton has for several years also advised individuals in business, and professionals in private practice.

Open to all those interested, the meeting is at 7:00 PM, Con Edison, 4 Irving Place, one block east of Union Square in Manhattan.

For more information: Jim Wetterau (212) 321-1999.

Global Networking In The 1990s

The increasingly international nature of commercial activity underscores the importance of global telecommunications to businesses worldwide. This seminar will explore the global networking experiences of providers and users, and discuss the emerging international telecommunications environment of the 1990s. Presented by the New York Section of the IEEE Communications Society, the seminar will take place on Tuesday, April 24, 1990 from 9 AM to 5 PM at the United Engineering Center, 345 East 47th Street, NYC.

For more information, contact Bert Lindberg at (212) 825-1527

EMBS Meeting: State-Of-The-Art In Biomedical Filtration

On February 14, 1990, the IEEE Metropolitan Section Engineering in Medicine and Biology Society, will present a program on "Function And Design Of Filters In Biomedical Applications." The speaker will be Thomas C. Gsell, PhD., Pall Corporation.

About The Talk

The presentation will cover a review of the state-of-the-art in Biomedical filtration. Some of the engineering aspects will be discussed as part of a short presentation followed by a lively interactive discussion period. Examples of devices cut open for display will be included.

For many years now, filtration devices have played a life-saving role in the field of Bio-Medicine. They are found in places ranging from the operating room to hospital wards to outpatient clinics, serving a wide variety of functions.

Essentially, the use of filters can be broken down into three areas: 1. Respiratory Therapies; 2. Extracorporeal Circuit, Cardio-pulmonary Bypass; 3. Transfusion Medicine.

In each case, the filtration devices are specifically designed to remove certain unwanted components, while passing those that are critically necessary. The talk will focus on the specific needs and functions of biomedical filters as well as some of the basic approaches towards their design.

About The Speakers

Tom Gsell has been with Pall Corporation for nine years in their Research and Development Department. He has focused primarily on the modification of polymers used in the formation of filtration materials and devices and is the co-inventor of twelve U.S. Patents in this technological field. In his last two years, he has co-directed a major new product development program in the filtration of transfused blood products.

Informal get-together prior to meeting at 6:30 PM, Tower Bldg., Cafeteria, First Floor, Rockefeller University.

Time: 7:30 PM, Wednesday, February 14, 1990.
Place: Rockefeller University, Room 305, Tower Bldg., York Ave., (Entrance at 66th St. Gate, NYC. Parking Available.
Further Information: Joe Bogovic (212) 241-8032; Edna Feher (212) 757-0610; Robert Heyman (914) 357-1230.

North Jersey Section Activities
FEBRUARY

February 7, 1990--"Optoelectronic Seminar Series—first of three Seminars"--North Jersey Section IEEE & Graduate Student Assoc., NJIT, 323 Martin Luther King Jr. Blvd., Newark, N.J. Dr. Gerald Whitman (201) 596-3232/3512.

February 8--"PACE Meeting: Engineers And Their Future In The Profession"--North Jersey Section's Professional Activities Committee for Engineers, 7:30 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. Robert Sinusas (201) 228-3941.

February 13--"Perceptual Transform Coding Of Stereo Signals"--North Jersey IEEE Acoustics, Speech and Signal Processing Chapter, 7:30 PM, AT&T Bell Labs., Murray Hill Auditorium, 600 Mountain Ave., Murray, Hill, N.J. John Burgess (201) 386-2736.

February 14--"State-Of-The-Art In Biomedical Filtration"--IEEE Metropolitan Section Engineering in Medicine and Biology Society, 7:30 PM, Rockefeller University, Room 305, Tower Bldg., York Ave., NYC. Joe Bogovic (212) 241-8032.

February 15--"Failure Prediction Of Components And System In Utility/Industrial Plants"--North Jersey Section Industrial Application Society, 7:30 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. Vittal Rebbapragada, (212) 839-2262.

February 15--"Seminar: Programming In The Language C"--North Jersey Section. **This series of Thursday evening sessions are filled.** See below for Saturday sessions

February 17--"Seminar: Programming In The Language C"--North Jersey Section. 14 Saturday Sessions. JCP&L Co., Madison Ave. & Punch Bowl Rd., Morristown, N.J. Call John A. Baka (201) 455-8534 for time and additional information.

February 19--"Remote Sensing With Microwaves And Millimeter-Waves"--North Jersey IEEE MTT-AP Chapter, 7:30 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. Dick Snyder (201) 492-1207.

February 20--"Want To Reduce Your '89 Taxes And Plan For 1990?"--Joint NY/NJ Engineering Management Society and PACE Meeting, 7:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, NJ. Al Bottani (201) 265-7797.

February 21--"Seminar: Applications Of Neural Networks"--NY Chapter IEEE Computer Society, 9:00 AM-4:30 PM, United Engineering Center, 345 East 47th St., NYC. **For details:** Andrew Weigel (212) 440-8533.

February 22--"Stability In MultiVariable Control Systems"--IEEE Control System Society, 8:00 PM, Fairleigh University, Teaneck Campus. Dr. Bill Bigley (201) 757-1600.

February 28--THIS MEETING HAS BEEN POSTPONED—WATCH FOR NEW DATE--"Industrial/Government Cooperation For Economic Growth"--North Jersey Section IEEE Intersociety Committee. David P. Perry (201) 235-8415.

Upcoming Meetings

March 20--"Seminar: Electrical Design Aspects Of Cogeneration Plants"--North Jersey Section Industry Application Society, 8:30 AM-4:00 PM, Meadowlands Hilton, Secaucus, N.J. Vittal Rebbapragada (212) 839-2262.

April 19--"Component Protection, Current Limitation And The National Electrical Code"--North Jersey Section Industrial Application Society, 7:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. Vittal Rebbapragada, (212) 839-2262.

SPECIAL SECTION BANQUET NOTICE

Reserve the evening of April 25th for Annual North Jersey Section Dinner and Awards Program. Details in March 1990 issue.

Members, Student Members and Non-Members Welcome
PLEASE POST

Remote Sensing With Microwaves And Millimeter-Waves

The February 19, 1990 meeting of the North Jersey IEEE MTT-AP Chapter will feature a talk on "Remote Sensing With Microwaves And Millimeter-Waves." The speaker will be Professor Erwin Schanda, Institute of Applied Physics.

About The Talk

Microwave and millimeter wave radiometry and radar became rather well established methods of remote sensing during the last few years. This happened partly because they can be employed independent of the time of day and almost independent of weather, and partly because of the important spectral features at these wavelengths of environmental media.

Theoretical studies as well as laboratory and field measurements of rough-surface scattering and emission from agricultural soil and sea surface and of volume scattering and emission from snow and vegetation yield a considerable comprehension of the interaction of microwaves with the molecular properties and the geometrical features of these media. Hence, algorithms have been derived which allow the interpretation of air- and space-borne radiometer- and radar-data in terms of natural parameters.

The absorption lines of atmospheric constituents in the millimeter wave range can be utilized to measure with radiometers various trace gases and other parameters, like temperature, throughout the strato- and mesophere. Our long-term investigations comprise local and regional observations (including polar regions) of species relevant to the stratospheric ozone chemistry by ground-based and air-borne instruments. For the observation of the global distribution of 0_3, H_20, C10 and temperature, a multi-channel radiometer is presently under construction for space shuttle flights from 1991 onward.

Some fundamentals of the methods and results of investigations—with emphasis on those carried out by the author's research group—will be presented.

About The Speaker

Erwin Schanda, a native of Austria, received the MSc degree in electrical engineering (Dipl. Ing.) 1957 from the Vienna Technical University and the PhD degree in physics 1968 from the University of Bern, Switzerland.

In 1958, he joined Philips Laboratories in Eindhover, the Netherlands, for research and development on ferrimagnetic material and its applications to microwave devices. Since 1964 he has been at the University of Bern. As project head, he initiated research activities on solar radioastronomy and and microwave remote sensing. He became Associate Professor in 1975 and Full Professor in 1976. From 1976-1984 he acted as Director of the Institute of Applied Physics.

Professor Schanda is head of the microwave division of this Institute. Two of his research groups are active in remote sensing:

- Millimeter wave sounding of trace gases and atmospheric parameters in the earth's strato- and mesophere. Development of millimeter-wave sensing units for observations from ground, from airplanes and from space.
- Study of emission and scatter behavior and related dielectric properties of snow, ice, soil and vegetation. Algorithms and interpretation of microwave remote sensing data from air- and space platforms.

Professor Schanda was invited guest professor at the University Paul Sabatier, Toulouse, France, during one semester in 1982. He is a member of the International Astronomical Union and the European Physical Society, he was elected Fellow of the Institute of Electrical and Electronics Engineers (1984) and Member of the International Academy of Astronautics (1985).

Erwin Schanda is author of a textbook, *Physical Fundamentals of Remote Sensing* (Springer, 1986) and editor-co-author of books on topics of remote sensing and of electromagnetic waves. He was co-organizer of three URSI-sponsored international symposia on microwave signatures in remote sensing.

Free Buffet Dinner

There will be a free buffet dinner for attendees in the Seminar Room, Alumni Center at 6 PM. **Reservations for the complimentary dinner are requested.**

Time: 7:30 PM, Monday, February 19, 1990. (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.

Stability In MultiVariable Control Systems

On February 22, 1990, the IEEE Control System Society will present a lecture by Dr. John J. Santapietro on a method for determining stability and robustness in multivariable systems. Dr. Santapietro is with Lockheed Electronics Company.

About The Lecture

The issues of stability and measures of closeness to instability are major considerations in the design and synthesis of automatic control systems. Classical frequency domain techniques work well as measures of system stability and robustness for single-input/single-output systems, but do not readily extend to multivariable feedback systems. In this context, the relevant measure of stability and robustness is the singular value decomposition of a certain system matrix. Personal computers and reliable and user-friendly software has made use of this matrix tool more practical. This talk focuses on how the singular value decomposition provides a precise and useful measure of matrix size and a characterization of robustness for multivariable feedback control systems.

About The Speaker

Dr. John J. Santapietro received a BS in mathematics from St. Peter's College in 1964. He received an MS and a PhD in mathematics from Stevens Institute of Technology in 1966 and 1969 respectively. He served on the full time mathematics faculty at Stevens at Rutgers. In 1977 Dr. Santapietro entered industry and is presently with Lockheed Electronics Company where he heads a group of engineers working in systems analysis and simulation. His research interests include numerical algorithms, digital signal processing, and adaptive array processing for communications and radar systems. His current project work involves systolic arrays, digital beamforming, and ELINT. He is a member of IEEE, the American Mathematical Society, and the Society for Industrial and Applied Mathemetics.

Time: 8:00 PM, Thursday, February 22, 1990.
Place: Fairleigh University, Teaneck campus, Muscarille Center Bldg., Robison Annex, Room 100. Adjacent to parking lot on East bound Route 4 entrance.
Information: Dr. Bill Bigley and Fred Schupan (201) 757-1600; and Prof. Vandana Gogate (201) 693-2120.

Center for Microwave and Lightwave Engineering at NJIT
North Jersey Section IEEE
& Graduate Student Association, NJIT
present
The New Jersey Institute of Technology
OPTOELECTRONIC SEMINAR SERIES

PLANNING COMMITTEE

M. Ettenberg, DSRC; E. Gordon, Photon Imaging; W. Kosonocky, NJIT; R. Leheny, Bellcore; T. Li, AT&T; S. Nagel, AT&T; E. Niver, NJIT; I. Reingold, SCEEE; G. Whitman, NJIT, J. Yardley, Allied-Signal.

I. NEW OPTOELECTRONIC DEVICES
February 7, 1990, Wednesday 3-6 PM, Theater

II. BROADBAND SYSTEMS
March 7, 1990, Wednesday 3-6 PM, Theater

III. FRONTIERS OF OPTOELECTRONIC OPPORTUNITIES
April 4, 1990, Wednesday 3-6 PM, Theater

Location: Seminars will be held in the NJIT Theater, 323 Martin Luther King Jr. Blvd., Newark, N.J.

Registration Information:
There is no charge for this Seminar Series. Refreshments served. Reserved Parking in Lot #7. Directions Available.

For Further Information Call:
Dr. Gerald Whitman, E.E. Dept., NJIT
(201) 596-3232/3512

FEBRUARY 7th PAPERS

"OPTICAL AMPLIFIERS"
Nils A. Olsson, AT&T Bell Labs

The traditional way of compensating for the optical loss in lightwave communication systems has been the rather cumbersome procedure of regeneration. That is, photon-to-electron conversion, electrical amplification, re-timing and pulse-shaping, and finally electron-to-photon conversion. In many applications it would be advantageous to utilize direct optical amplifications. Operated in the linear regime, optical amplifiers can compensate for the fiber loss and substantially increase the distance between repeaters. Semiconductor laser amplifiers can also be operated in the nonlinear regime. We show that saturation-induced self-phase modulation can be used for compensation of the fiber dispersion. Semiconductor laser amplifiers can also be operated in the nonlinear regime. We show that saturation-induced self-phase modulation can be used for compensation of the fiber dispersion. Semiconductor laser, Erbium doped fiber, and Fiber Raman amplifiers are all possible candidates for uses in communications systems. Each has its own distinctive advantages and drawbacks. The Fiber Raman amplifier is technically superior to the others but suffers the drawback of requiring large amounts of pump power. The main advantages of the Erbium doped fiber amplifier are polarization independent gain, immunity to crosstalk, and low insertion loss. Major drawbacks of the EFA are fixed and uneven grain profile. In this paper we will discuss the operational principles, device characteristics, and applications of optical amplifers.

Nils Anders Olsson was born in Solleftea, Sweden. He received his MSc degree from Chalmers University of Technology in 1975 and his PhD from Cornell University in 1982. Between 1975 and 1978, Dr.Olsson was with Schlumberger Overseas SA, Singapore doing electrical, nuclear, and sonic measurements in exploration oil wells. He joined AT&T Bell Laboratories, Murray Hill, N.J. in 1982 and is currently head of the Solid-State and Quantum Optics Reseach Department. Presently, his main research is in the field of optical communications, especially optical amplifier devices and systems. Dr. Olsson is an IEEE Traveling Lecturer on Optical Amplifiers.

"QUANTUM WELL DEVICES FOR OPTICAL PROCESSING"
David A.B. Miller, AT&T Bell Labs

Quantum wells, which consist of alternating ultrathin layers of two different semiconductors, offer new opportunities in optoelectronic devices. In particular, they allow low-energy, high-speed optical modulating and switching devices that can be fabricated in large two-dimensional arrays. These so-called Self-Electrooptic Effect Device (SEED) arrays are attractive for free-space optical switching and processing applications. The talk will discuss some of the novel physics involved, the device mechanisms, and some of the reasons for interest in optics in digital processing systems.

David A.B. Miller was born in Hamilton, U.K. He received a BSc in Physics from St. Andrews University and performed his graduate studies at Heriot-Watt University where he was a Carnegie Research Scholar. After receiving the PhD degree in 1979, he continued to work at Heriot-Watt University, latterly as a Lecturer in the Department of Physics. He moved to AT&T Bell Laboratories in 1981 as a Member of Technical Staff, and since 1987 has been the Head of the Photonics Switching Research Department. His research interests include nonlinear optics in semiconductors, optical switching, and the physics of quantum-confined structures. He has published over 110 technical papers and four book chapters and holds 13 patents. He has also served on numerous conference and society committees. Dr. Miller is a Senior Member of the IEEE, and is a Fellow of the Optical Society of America and of the American Physical Society. he was awarded the 1986 Adolph Lomb Medal for his contributions to semiconductor nonlinear optics and is co-recipient of the 1988 R.W. Wood Medal for his work on quantum-well optical properties.

"NEW SOLID-STATE LASERS"
Michael L. Shand, Allied Signal, Inc.

The special propensities of laser light—high spectral and temporal brightness and high energy—have created many applications for these quantum electronic devices. Lasers made from

solid-state crystals are more compact and rugged than those made from dye lasers and many gas lasers; however, the solid-state lasers, Nd:YAG and ruby are limited in wavelength diversity, energy output, or efficiency. In the last ten years a number of new solid-state lasers have been discovered which offer significantly improved laser performance. These lasers include alesandrite, titanium doped saphire, emerald, and other Cr doped lasers and rare earth doped lasers such as holmmium, erbium, and thulium. These lasers are being developed for nighttime illumination systems, measurement of atmospheric properties for weather prediction and wind shear, satellite-to-submarine communications, general surgery, diagnostic tools for magnetic confinement fusion, and many other applications. This presentation will include the physics of the lasing process which leads to the special capabilties of these solid-state lasers and relate these capabilities to various applications.

Michael L. Shand received the AB degree from Princeton University and the MSc and PhD (1973) degrees from the University of Pennsylvania. He studied Raman scattering in liquid crystals at the University of Paris and continued using Raman scattering to study lattice modes in copper halides and strontium fluoride at Arizona State University. In 1976, he joined Allied-Signal, Inc. (at that time, Allied Chemical Co.), where he worked on nonlinear processes in doped oxide crystals and polymers and the electro-optical properties of the just discovered alexandrite laser. He discovered the emerald laser and helped develop a large alexandrite laser for use in the isotope separation program at Los Alamos National Laboratory. In 1985, he became manager of the Laser R&D department where the capabilities of new solid-state lasers are being developed for military and commercial customers.

NY/NJ EMS Upcoming Meetings

March 20, 1990—Deborah Flathery Kiser, International Market Planning Manager, ATT International, will talk on the European Community 1992 (EC92).

April 24—Joint meeting with the Stevens Institute Chapter of the American Society for Engineering Management.

May 15—Joint meeting with the Program Management Institute.

June 19— To be announced.

Sept. 18—Dr. Deborah Kezsbom will speak on "The Engineer As A Manager."

Oct. 23—To be announced.

Nov. 20—To be announced.

Intersociety Calendar For 1990:

February 28, 1990 - MEETING FOR THIS DATE HAS BEEN CANCELLED. "Industrial/Government Cooperation For Economic Growth" is being rescheduled. Please watch for new date in future issue of Newsletter.

March 28 - "Radon In New Jersey"
April 25 - "The Waste Management Crisis"
May 30 - "Industrial Dynamics, Modeling Industry"
Sept.26 - "Input-Output Economics, Modeling Industry and National Economics"
Oct. 31 - "Engineering In Undeveloped Countries"

If you have questions about the above programs or suggestions for future programs that would be of general interest to the engineering and scientific community, contact David P. Perry, 57 Forest Hill Road, West Orange, NJ 07052 (201) 325-8415.

IEEE-IAS Chapter (NJ Section) Seminar
Electrical Design Aspects of Cogeneration Plants

Tuesday, March 20, 1990 — 8:30 AM - 4:00 PM
Meadowlands Hilton, Secaucus, New Jersey

On March 20, 1990, the North Jersey Section Industry Application Society, in association with the New Jersey Energy and Facilities Management Exposition, will present a workshop on the electrical design aspects of cogeneration plants. One of eight workshops sponsored by professional organizations at the 15th annual Energy Expo, this day-long panel symposium on cogeneration design will address the primary areas of concern to the electrical engineer.

R.V. Rebbapragada of Ebasco Services, Inc., Chairman of the IAS/North Jersey Chapter, will serve as moderator for in-depth presentations by speakers with experience in the field.

Selected speakers and topics include:

8:30 AM	Registration, Coffee and Danish	
9:00-9:15	Introduction	R.V. Rebbapragada Ebasco Services, Inc.
9:15-10:00	Planning Cogen Plants—Licensing and Utility Rates/Tariff Considerations	Harry Kociencki Director of Corporate Engrg. Hoffman-LaRoche
10:00-10:45	Utility Requirements for Cogen Plants	E. Griffith JCP&L
10:45-11:00	Break	
11:00-11:45	Plant and Generator Protection Requirements for Cogen Units	R.V. Rebbapragada Ebasco Services, Inc.
11:45-12:30	Electrical Control Panel, Metering, Alarms and Monitoring	Speaker to be announced
12:30-2:00 PM	Lunch	
2:00-2:45	Design Considerations of 30kw-1000kw Cogen Plants Using Reciprocating Gas Engines	Les Cadigan Tecogen, Inc.
2:45-4:00	Cogen Units: An Operator's Perspective	A. Bagocius Consolidated Power Co.

The cost for this complete technical discussion—including materials, morning refreshments, luncheon and entrance to the Energy Expo Exhibit Hall—is $150 for non-members, $100 for IEEE members, and $50 for students.

To reserve your place, make check or money order payable to Energy Expo, Inc., and mail to Energy Expo, Inc., P.O. Box 222, Maplewood, NJ 07040. **Deadline: 3/10/90.**

For more information on the IEEE workshop, please call Vittal Rebbapragada at (212) 839-2262 or Max Schramm at (201) 887-1120. For information about the Energy Expo, please call Sally Gambrill at (201) 763-5739.

PACE NEWS

By R. Tax

This month I am dedicating our column to our engineers. In celebration of National Engineers Week (NEW) and our steady fight against "Engineer Shortage" Propaganda (ESP), we have printed a letter from a young engineer from North Jersey and NJIT, Class of '88, dated September 13, 1989. Please note that the letter was written more than a year after graduation.

We have also included two responses, from members of the Long Island Section, to a question from the Region 1 PACE Co-ordinator, Bill Wilks.

First, I would like to invite you to attend two PACE meetings this month. The first on February 8th will give you the opportunity to suggest and select subjects and meetings of interest for 1990. The second is a joint PACE/Engineering Management Society meeting about "How To Reduce Your Taxes." See Newsletter for further information. If you can, please post our Calendar.

Dear Mr. Tax:

I recently had the opportunity to read your articles in the IEEE Newsletter regarding unemployment among engineers in the local area, particularly unemployment among recent graduates. I also find myself in that situation, as I graduated in May of 1988 from NJIT with a 3.15 GPA and I am currently working as a bookkeeper, a job which is totally unrelated to engineering. In fact, as if to add insult to injury, I was rejected for an electrical engineering officer position in the U.S. Air Force, as the military is apparently cutting back on its manpower.

One of the problems I have encountered in my job search is that many prospective employers scorn applicants who have been unemployed for long periods of time, and the longer one is out of work, the worse the situation gets. There is still a belief among the general public that an EE degree is a guaranteed ticket to a good job.

Also, there is a tendency for employers to categorize engineers according to specialty, even at the entry level. For instance, my senior year at NJIT I had to choose a two-semester "systems" sequence; I chose communications systems (which I now regret, as this field seems to be very dependent on defense spending). During my job search I found that some employers classified me as a communications engineer and would not consider me for positions in other areas. I personally don't think it is fair to classify an individual into a particular specialty at that point in his or her career.

However, I would like to thank you for your articles, as I have gained a degree of moral strength in knowing that I am not alone in my predicament. I would also certainly welcome any useful information or advice that you may offer me. In closing I would like to say that we engineers in the North Jersey area are very fortunate to have a PACE committee chairman who is taking such a personal interest in the employment situation.

Name withheld by request

Editor's Note: The word "employers" is often misused and in some cases it represents other employees involved in the hiring practice. Most of these people are from the personnel departments and they do not have an engineering education or background. They do not understand that a 3 or 6 credit specialty is a very small part of an engineering education and that good engineers are flexible. They also play it safe and disqualify candidates wherever they can. When they can't find their 5 pound butterfly they claim there's a shortage of butterflies.

Let's face it; when competition is as tough as it is today, people just don't want another itch to scratch.

The following are reprinted from the Long Island Section's newsletter called "The Pulse."

READERS RESPOND

(In the November issue, we posed two questions from the PACE Coordinator. Here is one of the responses.)

Would you encourage your child to pursue a career in engineering? Why?

Engineering; No, No, No
No profession, no trade, no career
No patent rights, no design rights, no copyrights
No honors, no prizes, no recognition
No big paychecks, no bonuses, no overtime pay
No equity, no security, no future
No office, no laboratory, no library
No authority, no lack of responsibility, no end of educating others
No leisure, no end of learning, no end of books and journals
No community ties, no company ties, no work ties
No skill portability, no pension portability, no career continuity
No organization, no political representation, no public adulation.

NO! NO! NO!

A SECOND RESPONSE

I'm writing in response to the inquiry of the PACE Coordinator in the November 1989 issue of *Pulse.* He poses the question, "Would you encourage your child to pursue a career in engineering? Why?"

I have two daughters, now college graduates, who showed talent in math and science when they were in high school. I told them I'd pay for their college educations, except if they studied engineering. If they'd been particularly keen on becoming engineers, they might have argued with my decision. However they only had to consider what they'd learned of my career, from my dinner-table conversations.

They observed how I'd been laid off several times during project cancellations and federal budget cuts. They saw how I sometimes came home from work too angry to talk to them. They heard how some boss demanded that I meet preposterous deadlines, even though the parts of the project that preceded my part had slipped schedule. If I objected to the schedule compression, the boss would ask if I was a competent engineer. How come I couldn't accomplish such an easy task in a short time?

They heard me tell how I tried to make my designs meet the specification and was questioned in light of budget and schedule contraints. They heard how some of my employers made managerial decisions that overruled engineering decisions. They heard me tell how certain "accidents" resulted from overruling engineering decisions, like the collapse of the sky walk in a Denver hotel or the BART train overrunning the station.

In the face of my experience, which I sometimes brought home from the office, my daughters decided to pursue careers other than engineering. They're happy and fulfilled professionally.

Name withheld by request

ENGINEERING LAYOFFS

Please make copies of all articles on engineering layoffs and send to: Mike Alterman, 509 Green Pond Road, Rockaway, NJ 07866.

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.

IEEE
North Jersey Section Seminar
PROGRAMMING IN THE LANGUAGE C

Fourteen Saturday Sessions starting February 17,1990
Jersey Central Power & Light Co., Madison Avenue & Punch Bowl Road, Morristown, N.J.

PLEASE NOTE: Course starting February 15th is FULL. This new course starts Saturday, February 17, 1990.

The North Jersey Section is offering a Saturday course titled "Programming In The Language C." The course will focus specifically on the Microsoft QuickC compiler, on the IBM PCs and compatible computers with DOS.

C is a general purpose programming language that has become one of the most widely used languages in the world. C features have been known to be efficient, economical and portable, and have proven especially useful in system programming because C facilitates writing fast, compact programs that are readily adaptable to other systems.

The lecture will be covered from fundamental to advanced data structures and handling. All the examples and techniques used throughout the course, are oriented toward the development and maintenance of serious, real-world C applications. Upon completion of the course, the student will have the skills to write useful and practical programs.

Students will be given assignments to do on their own IBM PC or compatible, if one is available; either at home or on the job. A **Microsoft QuickC compiler** and two **text books** will be supplied.

Prerequisites: The student should be familiar with at least one of the following languages - BASIC, COBOL, PASCAL, PROLOG and/or FORTRAN.

The instructor is Mr. Tuan Q. Nguyen, a Systems Engineer at Jersey Central Power and Light Company.

(1) February 17, 1990- Introduction to C: Why learn C?; Why QuickC?; Hardware Requirements; Knowledge Requirements; Convention and Style; Directories and Files Used by QuickC; Setting up QuickC; Starting QuickC; Getting Help; Fixing Errors; QuickC Editor and Environment.

(2) - C Fundamentals: Basic Elements of C Programs; Punctuation and Spacing in C Programs; Using Comments in C; Data Types and Declarations of Variables; The Power of Printf ( ).

(3) - Getting Input with Scanf ( ); Shortcut Assignments, Increments, and Decrements; Relational Operators; Logical Operators.

(4) - Repetition and Looping: The For Loop; The While Loop; Debugging and Loops.

(5) - Decisions and Branching: The If Statement; The Conditional Assignment Statement?; Multipath Branching; The Switch Statement; The Break Statement; The Continue Statement; The Goto Statement; More Complex Conditions for Branching.

(6) - Functions and Function Calls: Functions and Program Design; Declaring and Defining a Function; Local and Automatic Variables; Register Variables; Passing Information to a Function; Functions with Many Parameters; Functions that Return Information; Recursion; Noninteger Functions; Function Prototypes.

(7) - Arrays: How Arrays Are Stored in Memory; How to Declare Arrays; Referencing and Using Array Items; Bounds Checking Arrays in Your Code; How to Initialize Arrays; Arrays and Functions; How Array Offsets Advance; Multidimensional Arrays; Advanced Topics and Tricks; The Bitwise Operators, Tiny Arrays.

(8) - Addresses and Pointers: Addresses Reviewed; What Is A Pointer?; Accessing Variables with Pointers; Passing Pointers to Functions; Pointers and Arrays; Pointer Arithmetic; The Interchangeability of *amts and amts [ ]; 1value vs rvalue.

(9) - Advanced Pointers: Type Casting pointers and Addresses; Far Pointers; Functions that return addresses; Dynamic Arrays; Advanced Pointer techniques.

(10) - Strings: Declaring and Initializing Strings; The String Pool and String Addresses; Pointers and Initialized Strings; Formatting strings with printf ( ); String Input and Output; String Manipulation Routines; Arrays and Strings; The Arguments to main( )-argv and argc; Character Classification and Transformation.

(11) - Managing Files: Top-level I/0; Mid-Level (Unbuffered) File I/0; The File System; Advanced Error Handling.

(12) - Advanced Data Types: Structure - An Array of Different Types; Union-Multiple Types in the Same Space; Enumerated Data with enum; Bit Fields; Advanced typedef.

(13) - Large Project: Advanced C Preprocessor; Using QuickC for Large Projects.

(14) - C and the Hardware: Keyboard Input functions; Reading Non-ASCII Keys; Console I/0 Functions; Keyboard Control with ANSI.SYS; Using QuickC to Access BIOS; Cursor and Screen Control with BIOS Calls.

One Snow Day.

Class Size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone Reservations will not be accepted. Reservations accepted after February 8, 1990 will require an additional **late fee** of $25.

Where: Jersey Central Power & Light Co., Madison Ave. & Punch Bowl Rd., Morristown, N.J.
When: Fourteen sessions, Saturdays starting February 17 1990. (Plus One Snow Day.)
Cost: With Text Books and QuickC compiler, IEEE Members $230; non-IEEE Members $305.
With Text Books only, IEEE Members $160; Non-IEEE Members $235.
Contact: Mr. John A. Baka at (201) 455-8534 (Business)

Registration for Course starting February 17, 1990 - "Programming In The Language C"

To: Mr. John Baka, Distribution Engineering, JCP&L Company, Madison Avenue at Punch Bowl Road, Morristown, NJ 07960

Name _____ IEEE No. _____

Affiliation _____ Phone No. _____

Address _____

_____

Check if QuickC Compiler is needed or not Yes [ ] No [ ] Enclose required fee made payable to **"North Jersey Section IEEE"**

Signature _____