

# "NEW HORIZONS IN MEASUREMENTS TRENDS IN THEORY AND APPLICATION"

Sponsored by the NORTH JERSEY SECTION  
In Cooperation with the N.Y. JOINT CHAPTER ON  
INSTRUMENTATION AND MEASUREMENTS

October 8 and 9, 1969  
Governor Morris Inn  
Morristown, N. J.



The IEEE

## Newsletter

The Magazine of the North Jersey Section

Keynote Speaker:  
**DR. JAMES H. MULLIGAN**

Banquet Speaker:  
**DR. GEORGE B. HOADLEY**

**October, 1969**



# First Annual Measurements Conference

"New Horizons in Measurements—Trends in Theory and Applications" is the first conference of its type to be presented by the North Jersey Section. This two-day conference with measurements as the theme will be of interest and value to scientists, engineers and most other persons involved in electronics. Highlights of the conference are six technical sessions, a plenary session and a banquet.

The conference, sponsored by the North Jersey Section in cooperation with the N.Y. Joint Chapter on Instrumentation and Measurements, will be held October 8 and 9, 1969 at the Governor Morris Inn, Morristown, N. J.

At the opening Plenary Session, the conference keynote will be given by *Dr. Jones H. Mulligan, Jr.*, Executive Secretary of the National Academy of Engineering. Prior to joining the Academy in 1968 he was on the faculty of the Department of Electrical Engineering at New York University, where he served as Chairman of the Department since 1952.

Dr. Mulligan's recent research activity has been in the area of distributed networks and active networks and feedback amplifiers. He has been an active member of numerous AIEE-IRE and IEEE technical committees. He is Vice President for Technical Activities of the IEEE. Previously he served as IEEE representative on the Executive Committee and Board of Directors of the Engineers' Council for Professional Development. He is past Chairman of the Group on Circuit Theory and the Education Committee of the IEEE.

Dr. Mulligan is a fellow of the Institute of Electrical and Electronics Engineers and the American Association for the Advancement of Science, as well as a member of the American Physical Society, American Mathematical Society, Mathematical Association of America, the American Society of Engineering Education, Sigma Xi, Tau Beta Pi, and Eta Kappa Nu.

Dr. Mulligan received the B.E.E. and the E.E. degrees from the Cooper Union School of Engineering, the M.S. degree from Stevens Institute of Technology and the Ph.D. degree from Columbia University.

The banquet, set for Thursday evening for 7:00 to 9:00 P.M., will formally close the Conference. Tickets priced at \$6.00 each will be available at the Registration desk starting at noon Tuesday, October 8.

The banquet speaker is *Dr. George B. Hoadley*, Head of the Electrical Engineering Department at North Carolina State University. His fields of research interest are network synthesis, computer programming and electrical measurements.

Dr. Hoadley is the author (with Timbie and Bush) of *Principles of Electrical Engineering*, a book which was widely used as a first book in electrical engineering during the period 1945 to 1960. Some of his very recent publications have dealt with the fields of moving electric dipoles and tables of functions for semiconductor surface calculations.

Dr. Hoadley's society memberships and honors include: New York Academy of Science, Engineering Societies Council of New York (former member), Sigma Tau, Sigma Xi, Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi, ASEE and Fellow of IEEE. He has been active on measurements committees of the IRE, AIEE, and IEEE. He has been editor of the *IEEE Transactions on Instrumentation and Measurement* and its predecessors since 1953.

Dr. Hoadley received the B.S. degree in electrical engineering from Swarthmore College and the M.S. and D.Sc. degrees in electrical engineering from MIT.

## GENERAL INFORMATION

### TECHNICAL PROGRAM

Plenary Session—*Conference Keynote* (1:30 P.M., Wednesday, October 8, 1969)

Session I—*Analog and Digital Measurements* (3:00 to 5:00 P.M., Wednesday, October 8, 1969)

Session II—*Time and Frequency Domain Measurements* (3:00 to 5:00 P.M., Wednesday, October 8, 1969)

Session III—*Improvement of Measurement Techniques* (7:00 to 9:00 P.M., Wednesday, October 8, 1969)

Session IV—*Panel Discussion: New Horizons in Environmental Instrumentation* (7:00 to 9:00 P.M., Wednesday, October 8, 1969)

Session V—*Advanced Power System Measurements* (3:00 to 5:00 P.M., Thursday, October 9, 1969)

Session VI—*Automated and Computer-Aided Measurements* (3:00 to 5:00 P.M., Thursday, October 9, 1969)

*Banquet* (7:00 to 9:00 P.M., Thursday, October 9, 1969)

Full details on the program can be found on page 3 of the September Newsletter, or by calling (201) 398-5524.

### LOCATION

All sessions will be held at the Governor Morris Inn, 2 Whippany Road (at Lindsley Drive), Morristown, N.J.

### PARKING AND TRANSPORTATION

Ample parking space is available in the Governor Morris parking lot. Bus service is available:

Between Newark and Morristown—No. 70 Public Service Bus, or No. 146 DeCamp Bus.

Between New York City and Morristown—No. 77 DeCamp Bus.

### REGISTRATION

Registration will be held at the Governor Morris Inn starting at 12 Noon Wednesday, October 8, and will be continued throughout the conference.

### CONFERENCE FEES

Registration fees are \$10.00 for IEEE members. Registration fees for non-members is \$15.00.

The fees include admission to all sessions and a copy of the conference proceedings which contains the complete text or an abstract version of most papers.

Badges are required of all attendees for admission to the sessions.

Tickets for the Banquet may be obtained at the Registration Desk and should be called for in advance.

### CONFERENCE PUBLICATIONS

A volume of the conference proceedings, which contains the complete text or an abstract version of most papers to be presented, will be distributed at registration.

Extra volumes may be purchased at \$15.00 each (U.S. Funds) at the Registration Desk.

After October 9, 1969, volumes may be purchased from the Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, New York 10017.

### HOUSING AND MEALS

Lodging arrangements may be made through the Governor Morris Inn (201-539-7300). Radio, TV and individually-controlled air conditioning and heating are standard.

The Governor Morris has excellent facilities for meals and refreshment.

# The IEEE Newsletter

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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.

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The Newsletter, October 1969

## MEETINGS CALENDAR

Wednesday, October 8, 1969

New York Insulated Conductors Group — **Ideal Cable Insulation**, Union Carbide Corporation, Third Floor Meeting Room, 270 Park Avenue, N.Y.C., 6:30 P.M.

Thursday, October 9

New York Substation Group — **Designing Substations for Compactness**, Consolidated Edison Company, 4 Irving Place, N.Y.C., 6:30 P.M.

Monday, October 13

New York Comm. Tech. — **Flavors and Fragrances Trip**, International Flavors and Fragrances Inc., Union Beach, N.J., 10:00 A.M. (*See September issue for details*)

Wednesday, October 15

North Jersey GMTT/GAP — **What Has Antennas and Propagation to do with Insect Eyes?**, Arnold Auditorium, Bell Laboratories, Murray Hill, N.J., 8:15 P.M.

Wednesday, October 15

New York Transmission and Distribution Group — **Methods of Serving Spot Loads**, Union Carbide Building, 3rd Floor Meeting Room, 270 Park Ave., N.Y.C., 6:30 P.M.

Thursday, October 16

North Jersey Reliability — **The Effects of the Reliability Discipline on the Lunar Landing Mission**, Bell Telephone Laboratories, Whippany, N.J., 8:00 P.M.

Wednesday, October 22

New York Power and Industrial Division — **New Horizons in Engineering Education**, Union Carbide Auditorium, 270 Park Ave., N.Y.C., 6:30 P.M.

Wednesday, October 22

New Jersey Chapter Magnetics Group — **Nanosecond, High Resolution Kerr-Optical Measurements**, Murray Hall, Rutgers University, New Brunswick, N.J., 8:00 P.M.

Thursday, October 23

Engineering Management Group — **Surviving Your Profession**, Room 125 of the United Engineering Center, 345 East 47th Street, N.Y.C., 7:30 P.M.

Thursday, November 13

North Jersey GMTT/GAP — **Preteronics—Springs, Magnets and Microwaves**, Arnold Auditorium, Bell Telephone Laboratories, Murray Hill, N.J., 8:15 P.M.

Tuesday, November 18

New York Power and Industrial — **Inspection Tour of Kodak Processing Laboratory**, 16-31 Route 208, Fair Lawn, N.J., 7:30 P.M.



## Lunar Mission Reliability

The North Jersey Reliability Group will hold a meeting on October 16, 1969 at 8:00 P.M. at Bell Telephone Laboratories, Whippany, New Jersey.

The speaker will be *Mr. Seymour Berg*, Systems Reliability Group Leader, LM Project, Grumman Aircraft Engineering Corporation. His topic will be "The Effects of the Reliability Discipline on the Lunar Landing Mission."

Mr. Berg will describe the structure of LM Reliability in relation to parts, subsystems and systems, the development program that was undertaken and the studies and analyses that were conducted on both unmanned and manned missions. His talk will include examples of some of the problems that were encountered and the manner in which they were resolved. The presentation will highlight the combined effort that was made in regard to the achievement of reliability objectives and the effect it had upon the Lunar Landing Mission.

**Time:** Thursday, October 16, 1969, 8:00 P.M.

**Place:** Bell Telephone Laboratories, Whippany, N. J.


**Additional Information:** Call R. Wenman at (201) 256-4000, Ext. 2855.

## Ideal Insulation?

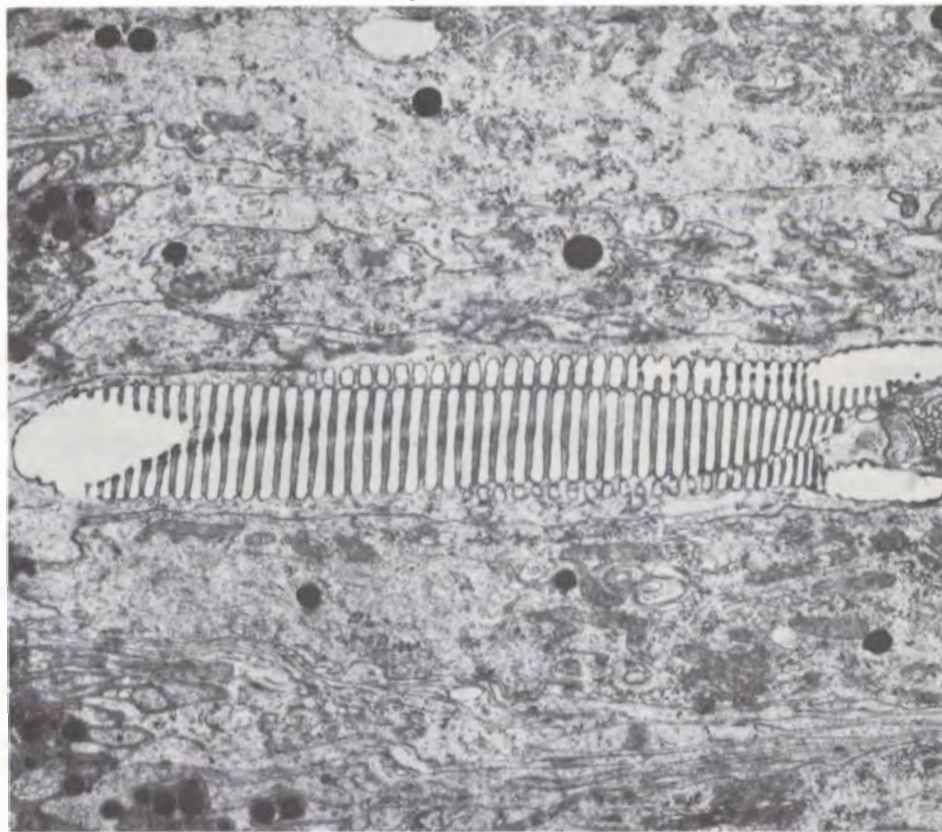
A general discussion of the merits of EPR and EPR-XLPE insulation on power cables will be held by the New York Insulated Conductors Group. A panel of industrial personnel will present various viewpoints. Following will be a question and answer period. John F. Shimshock of P.S.E. & G. Co., John A. Mulligan of Con Edison Co., and Fred Bender of LILCO, will sponsor the meeting.

**Time:** Wednesday, October 8, 1969, 6:30 P.M.

**Place:** Third Floor Meeting Room, Union Carbide Corporation, 270 Park Avenue, N.Y.C.

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## What has Antennas & Propagation Got to do With Insect Eyes?



*Electron Micrograph of a Waveguide (Photoreceptor) and interference filter from the eye of a Buckeye butterfly.*

A talk on the optics of insect eyes from antennas and wave propagation point of view will be presented at the October meeting of the North Jersey Section of GMTT/GAP.

### About the Talk:

Insect eyes contain structures that resemble diffraction gratings, multimode cylindrical waveguides, and periodically layered interference filters. Since these structures have characteristic dimensions of the order of a wavelength of light, they can interact strongly with light and influence the eye's optical performance. Antenna and Propagation theory is very helpful in understanding insect optics.

The discussion will center around the optical components of the insect eye, their structure, optical performance, and biological function discussed in terms familiar to the engineer. The living insect eye often displays spectacularly beautiful colored patterns, many of which will be shown. Your wife should enjoy the presentation: bring her. The speaker promises no equations.

### About the Speaker:

Gary D. Bernard is an Assistant Professor of Ophthalmology and Engineering at Yale University. The principal area of his research has been electromagnetic

theory and antennas. For the last 3½ years he has been collaborating on a study of the optical structure and function of insect eyes with Dr. William H. Miller, Professor of Ophthalmology and Physiology at Yale.

He majored in Electrical Engineering at the University of Washington, Seattle, and received Bachelor's, Master's and Ph.D. degrees in 1959, 1960, and 1964, respectively. From 1965 to 1968 Dr. Bernard was a faculty member of the M.I.T. Department of Electrical Engineering where he taught electromagnetics and did research in the areas of plasma physics and insect vision. During the first year and one-half at M.I.T. he held a Ford Foundation Postdoctoral Engineering Fellowship.

Dr. Bernard is a member of the IEEE, Optical Society of America, Association for Research in Ophthalmology, Entomological Society of America, and the AAAS.

**Time:** Wednesday, October 15, 1969, 8:15 P.M.

**Place:** Arnold Auditorium, Bell Laboratories, Murray Hill, New Jersey.

**Dinner:** 6:15 P.M., Wally's, Watchung, New Jersey. (No reservations required.)



## Preterersonics—Springs, Magnets and Microwaves

The November meeting of the North Jersey Section of GMTT/G-AP will feature a talk by the 1969 MTT National Lecturer, *Dr. R. W. Damon*.

### About the Talk:

Microwave sound waves in solids provide novel and useful properties for both physical investigations and device use. Preterersonic technology is based on the propagation of high frequency elastic waves and their interaction with spin waves and with light. The outstanding characteristic of elastic waves is their low propagation velocity (four to five orders of magnitude less than the velocity of light), which permits the construction of compact delay lines. The interaction between elastic waves and spin waves in magnetic materials such as YIG provides the basis for a class of electrically variable delay lines and broadband dispersive filters. This interaction also leads to some interesting parametric amplification effects in YIG. In this talk, the physical principles of these phenomena will be reviewed, experimental results will be de-

scribed and the status of some devices will be discussed.

### About the Speaker:

Richard W. Damon is Head of the Quantum Electronics Department and Associate Manager of the Solid State Sciences Laboratory at the Sperry Rand Research Center, Sudbury, Massachusetts. He received the B.S. in physics and the M.A. and Ph.D. degrees in applied physics from Harvard University.

Dr. Damon is a Fellow of the IEEE and a member of the American Physical Society, Sigma Xi, and The American Association for the Advancement of Science. He serves on the Editorial Board of the Proceedings of the IEEE and is a member of the Ad Com of the Group of Sonics and Ultrasonics and of the Boston Section Executive Committee. He is a member of the NASA Advisory Subcommittee on Electrophysics and of the NASA Working Group on Electronic Materials. In 1966-67 he was Chairman of the Boston Chapter of the IEEE Group on Microwave Theory and Techniques and co-chairman of the 1967 Microwave Symposium. He has served on committees for the Conference on Magnetism and Magnetic Materials (1960, 1965, 1967, and



*Dr. R. W. Damon*

1968), NEREM (1961-63), Intermag (1969) and the Ultrasonic Symposium (1965-69), as Associate Editor of the Journal of Quantum Electronics (1965-68), on the Editorial Board of the Transactions on Microwave Theory and Techniques (1961-66) and as co-editor of the October, 1965 Proceedings of the IEEE, Special Issue on Ultrasonics.

**Time:** Thursday, November 13, 1969, 8:15 P.M.

**Place:** Arnold Auditorium, Bell Telephone Laboratories, Murray Hill, New Jersey.

**Dinner:** 6:15 P.M., Wally's, Watchung, N.J.

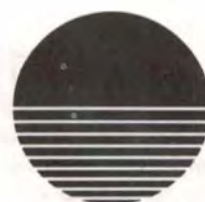
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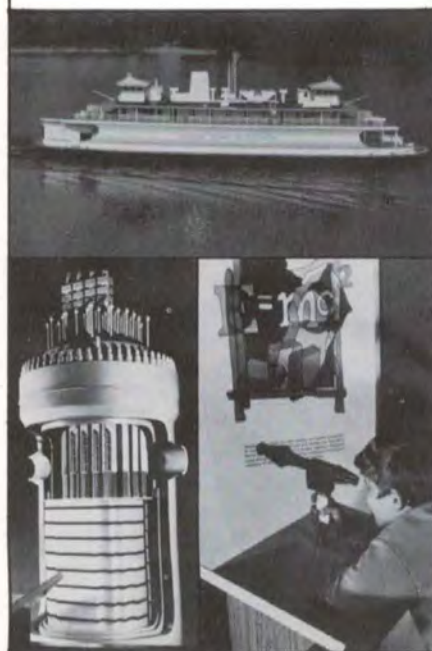


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## Kerr Measurements

The New Jersey Chapter of the Magnetics Group will hold its first Fall Meeting. *Dr. Hsu Chang* of the IBM T. J. Watson Research Center will describe Kerr optical experiments carried out with coupled magnetic films. The experiments feature very fast switching of very small elements.

Dr. Chang received his B.S. degree from Taiwan University in 1953, and his M.S. and Ph.D. degrees in Electrical Engineering from Carnegie Institute of Technology, in 1957 and 1959 respectively. Since joining IBM in 1959, he has worked on various problems concerning thin magnetic film phenomena.

**Time:** Wednesday, October 22, 1969, 8:00 P.M.

**Place:** Murray Hall, Rutgers University, New Brunswick, N.J.

**Pre-meeting Dinner:** Alumni Center, 197 College Avenue, New Brunswick, 6:00 P.M. Reservations should be made with Mrs. J. Rusciano, (201) 826-5100, Ext. 317.

## Serving Spot Loads

The influx of high rise buildings and isolated shopping centers has created a need for improved methods of supplying reliable and adequate service to large spot loads.

Methods of serving these spot loads will be discussed at the first meeting of the New York Transmission and Distribution Group by speakers from Consolidated Edison and Long Island Lighting. Topics to be considered will include the choice of transformer location, optimum voltage selection, and the choice of proper backup equipment.

**Moderator:** Dominick Langella, Long Island Lighting Co.

**Time:** Wednesday, October 15, 1969, 6:30 to 8:30 P.M.

**Place:** Union Carbide Building, 3rd Floor Meeting Room, 270 Park Avenue, N.Y.C.

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## Photo Laboratory Tour

Due to the popularity shown in previous years, the Kodak Processing Laboratory has consented to be the host to the members of the IEEE at another inspection tour of their facilities.

In conjunction with the tour, all tickets are limited to adults and the taking of any pictures is prohibited. The purchasing of tickets can be made by contacting Paul Samuels, Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York 11801. All requests must be received by November 6, 1969 and all transportation must be arranged by the individual.

Only those requests accompanied by a stamped self-addressed envelope will be honored or acknowledged.

**Time:** Tuesday, November 18, 1969, 7:30 P.M.

**Place:** Kodak Processing Laboratory, 16-31 Route 208, Fair Lawn, N.J.

## Engineering Education

The Power and Industrial Division of the New York Section has scheduled a General Meeting for October 22 in the Union Carbide Auditorium to discuss the ever-expanding New Horizons in Engineering Education.

The Moderator of this discussion will be *Mr. George Flam*, of the Port of New York Authority.

The Speakers will include: *Mr. Harold Edelson*, Graduate Engineering Educa-

tion Program Staff, Western Electric Company; *Professor Abraham Abramowitz*, Professor of Electrical Engineering, C.U. N.Y., and Former Electrical Engineer for the New York City Board of Transportation; and *Professor Donald Hunt*, Director of the Undergraduate Curriculum Committee of the Polytechnic Institute of Brooklyn.

**Time:** Wednesday, October 22, 1969, 6:30 P.M.

**Place:** Union Carbide Auditorium, 270 Park Avenue, N.Y.C.

## Compact Substations

The New York Substation Group is planning a presentation dealing with the utilization of new equipment and designs for reducing the area required for distribution substations and high-voltage switching stations. Moderator for this meeting will be *Mr. Henry Koehler*, Consolidated Edison Company of New York. *Mr. Joseph Cavelia*, LILCO, will be the speaker, punctuating his talk with appropriate slides. A general discussion will follow.

Additional information may be obtained from the sponsor by addressing such requests to Mr. J. A. Lenge, Consolidated Edison Company of New York, 4 Irving Place, Room 1315-S, New York, N.Y. 10003.

**Time:** Thursday, October 9, 1969, 6:30 P.M.

**Place:** Consolidated Edison Company, Room 503, 4 Irving Place, N.Y.C.

## "Are You Missing Something?"

With the new year just getting started for the North Jersey Section, your officers look back at the previous year's activities with the aim of making improvements over what was a successful year.

I feel I express the feelings of the other officers when stating that one continual aim of the section is the increase in attendance at Section and Chapter meetings. I wonder if many of our members aren't missing something by not attending. Having arranged similar meetings in past years, I know how much time and effort is spent lining up these presentations and trips for the membership. It is very disappointing, in too many instances, to have small attendance, especially when the speakers are most capable in covering their subject which is timely as well as interesting and instructive. Those attending have the opportunity of asking questions, the answers to which would often be difficult to secure from other sources. The meetings are well publicized in advance in the Newsletter, bulletin board notices, post card mailings to Chapter members, and often by other means.

As a suggestion to the membership when you receive your Newsletters, make a date then to attend some of the future meetings which are of interest. If the subject appears to be useful to others in your company, invite them whether or not they are IEEE members. Maybe a circular notice or posted bulletin within your company will give others an opportunity to hear a presentation of particular merit.

We have never had a problem accommodating all who come, members and non-members alike. Will we see you at the next meeting?

*Carl Torell, Secretary*



## Surviving Our Profession

Have you ever thought that your striving to get ahead may be an occupational hazard? An unusual opportunity to gain an insight into the often unrecognized health aspects of being an engineer or engineering manager will be offered in a talk by *Carl U. Dernehl, M.D.*, Associate Medical Director of the Union Carbide Corporation and currently the President of the American Academy of Occupational Medicine.

Dr. Dernehl will cover the problems connected with tensions of the job, "seven-day" work weeks, weight, alcoholism, sedentary nature of the professional's occupation, etc. He will touch on what health steps can be taken to improve our own personal performance and, if a supervisor or manager, that of our subordinates. He will indicate both what we, as individuals, should know about our health (and how we may recognize potential hazards to it) and the programs that industry is currently implementing on our behalf.

The speaker has been extensively associated with occupational health both at the corporate level and in university teaching. He has been with Union Carbide since 1955 and has served as Clinical As-

sistant Professor of Industrial Medicine at New York University since 1958. Dr. Dernehl received his undergraduate and medical degrees at the University of Wisconsin. He is a member of the AMA, a Fellow of both the Industrial Medical Association and the American Academy of Occupational Medicine, also is on the Board of Directors of the latter, and in addition serves on various industrial medical committees.

This talk, sponsored by the Metropolitan Chapter of the Engineering Management Group, will be given Thursday, October 23, 1969 at 7:30 P.M. in Room 125 of the United Engineering Center (345 East 47th Street, New York City). The talk will be followed by the usual question and answer period. You are also cordially invited to the pre-meeting dinner at Ferdi's Restaurant, First Avenue near 44th Street. Please phone in your reservations by October 20th to Mr. L. Katz (212) 396-2355.

**Time:** Thursday, October 23, 1969, 7:30 P.M.

**Place:** Room 125 of the United Engineering Center (345 East 47th Street, New York City).

**Pre-meeting Dinner:** Ferdi's Restaurant, First Avenue near 44th Street.

## Flavors and Fragrances

The New York Section of the Power and Industrial Division is sponsoring an interesting and unusual visit to International Flavors and Fragrances Inc. in Union Beach, New Jersey. This corporation which has plants throughout the world manufactures aroma chemicals for soaps, detergents, toiletries, and household products and flavorings for beverages and processed foods. The facility at Union Beach contains the Corporations Research Center where scientists and technicians are engaged in projects to find new means of simulating common aromas and flavors.

Wives and children of high school age are welcome to take this trip. Please send your ticket requests with a stamped self-addressed envelope to: Mr. E. G. Birbick, c/o Reynolds Metals Co., 100 Evergreen Place, East Orange, New Jersey 07018.

Details regarding transportation and other arrangements may be obtained by contacting Mr. Birbick at (201) 676-4441.

**Time:** Monday, October 13, 1969, 10:00 A.M.

**Place:** International Flavors and Fragrances Inc., Union Beach, New Jersey.

## Student Affairs

The North Jersey Section warmly congratulates the following Student Members of the IEEE upon their graduation:

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# Do You Have These Things In Common With Joe Merlo?

- 1.** The chance to work with a company which is continually pushing the state of the art of technology . . .
- 2.** The opportunity to work in a technically excellent environment . . .
- 3.** The privilege of circuit designing in an engineering department that is highly people-oriented . . .
- 4.** The challenge of designing electronic instruments which stretch the ability of the engineer.

We're proud to tell the world about Joe Merlo's accomplishments. He designed Monsanto's 110A MHz integrated circuits Counter-Timer and made it system oriented and programmable. Joe insured its quality by thorough testing and the use of high quality components such as 1% Corning resistors, Motorola integrated circuits and computer grade capacitors. We're glad that Joe is one of our circuit engineers because he not only designed a superior instrument but one that consistently exceeds its specifications!

If you enjoy recognition for a job well done, then Monsanto's the place for you! We currently have opening for:

Senior Electronic Engineer with 8-10 years of circuit design experience in the design of oscilloscopes, digital voltmeters, counter-timers, pulse generators, frequency synthesizers or related instruments.

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