

# THE NUCLEUS

March 1990

Of the Northeastern Section of the American Chemical Society Vol. LXVIII, No. 6

## Monthly Meeting

*Richards Medal to be  
presented to R.A. Marcus*

## 1990 NESACS Slate

## 1990 NESACS Committees

## Historical Notes

*Fritz Zwicky*



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February 14	Mass Spectroscopy for Chromatographers	Rockville, MD
April 3	Practical Capillary Gas Chromatography	Andover, MA
April 4	Practical Capillary Gas Chromatography	Lebanon, NH
May 15	Fundamentals of Liquid Chromatography	Valley Forge, PA

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**Cover:** Prof. Rudolph A. Marcus

**May Issue Deadline:** March 20, 1990

## THE NUCLEUS



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# 1990 NESACS Candidates for Election Biography

## Chairman-elect (one to be elected)

Katie Stygall, *Bradford College*; Judy Kelley, *University of Lowell*

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# incumbent Alternate Councilor

## Norris Award Committee (Two to be elected)

Elmere Jones, *Northeastern University*; Peter Pappas, *University of Massachusetts, Boston*; Jayant Sayne, *Gillette Co.*; Marco Scheer (retired)

## 1990 Nominating Committee: (Two to be elected)

Iclal Hartman, *Simmons College*; David Howell, *Northeastern University*; Richard Milius, *Research Biochemicals, Inc.*; Michael Strem, *Strem Chemicals, Inc.*

**Petition Candidates:** In accordance with the Northeastern Section Constitution, Article VIII, Section 3, "Any group comprising 2 percent or more of the membership of the Northeastern Section may nominate candidates for any elective office provided that such nomination (accompanied by the Signatures of the nominating group) shall be presented in writing to the Chairman of the Nominating Committee not more than ten days following the March Meeting of the Northeastern Section." Accordingly, such petitions are due March 18, 1990, and should be sent to Dr. Michael Strem, Strem Chemicals, Inc., P.O. Box 108, Newburyport, MA 01950. At least 100 valid signatures are required. Preferably, the petition should be sent by registered mail. ◇

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## Rudolph A. Marcus

Rudolph Marcus was born in Montreal, Canada and received his B.Sc. and Ph.D. from McGill University (1943,1946). His graduate research, under the direction of C.A. Winkler, was on reactions in solution. After postdoctoral experimental research with E.W.R. Steacie at the National Research Council of Canada and theoretical research with O.K. Rice at the University of North Carolina, he joined the faculty of the Polytechnic Institute of Brooklyn in 1951. He became Professor of Physical Chemistry at the University of Illinois in 1964 and, in 1978 Arthur Amos Noyes Professor of Chemistry at the California Institute of Technology. He has been a Visiting Professor at New York University, the University of Oxford (England) and the University of Munich.

He has served on numerous committees of the American Chemical Society, the American Physical Society and governmental bodies. He has served on editorial boards of many journals in physical chemistry. He is known for his work in many fields of theoretical chemical kinetics, including the theories of unimolecular reactions (RRKM theory), electron transfer reactions, electrode reactions, and various transfer reactions, the semi-classical theory of collisions and of bound states, and collision coordinates. He has received many awards, including the Robinson and the Centenary Medals of the Faraday Division of the Royal Society of Chemistry (London), the Irving Langmuir Award in Chemical Physics, the Peter Debye Award in Physical Chemistry and the Willard Gibbs Medal of the American Chemical Society, and the National Medal of Science. He is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and a Foreign Member of the Royal Society (London). He has received several honorary degrees. ◇

## March Meeting

The Theodore William Richards  
Medal Award Meeting

Thursday, April 5, 1990

Harvard University Faculty Club

- 6:00 Preprandial Hour  
6:30 Dinner  
Harvard University Science Center, Lecture Hall B  
8:15 Biography of Theodore William Richards - Dr. Dietmar Seyferth - Massachusetts Institute of Technology  
8:25 Introduction of Medal Recipient - Dr. Roy G. Gordon - Harvard University  
8:35 Presentation of Medal to Professor Rudolph A. Marcus - Dr. E. Joseph Billo - Boston College  
8:40 Richards Medal Address-"Chemical Reaction Rates-Theory and Experiment"-Prof. Rudolph A. Marcus-California Institute of Technology  
9:40 Reception for Awardee

Dinner reservations should be made no later than March 2. Please call Mrs. Karen Piper at (508) 456-8227 or (800) 872-2054. Reservations not cancelled at least 24 hours in advance will be billed for the dinner price. Members, \$18.00; Non-members, \$20.00; Students and Retirees, \$8.00. THE PUBLIC IS INVITED.

April Meeting: Thursday, April 5, 1990 (note the change from second to first Thursday!), bestowing the Esselen Award on Thomas J. Dougherty of Roswell Park Memorial Institute, Buffalo, N.Y., Harvard Faculty Club and Harvard Science Center.

## Consultants' Group, Anyone?

The great interest shown at the October meeting on Consulting As An Aspect of a Chemist's Career and a recent inquiry by a Section member has led the Professional Relations Committee to propose formation of a Consultants' Group. This subsection of the Section could be formed if as few as thirty chemists decide that they would join such a group. The purpose of a Consultants' Group would be to

bring together chemists who do consulting either part-time or full-time, or chemists who see consulting in their future plans, to exchange information, network, provide training and encouragement, or otherwise interact on social and professional levels. Is there anyone out there who would like to see such a group formed? If so, please let Mrs. Piper (tel. 800-872-2054 or 508-456-8227) know of your interest.

## Abstract

### Chemical Reaction Rates-Theory and Experiment

The study of chemical reaction rates has provided a fruitful ground for the interaction between experiment and theory.

In the case of electron transfers, the field has grown considerably from the early post-World War II days when the rates of the simplest types of electron transfer reactions, self-exchange electron transfers, were measured using the readily available radioactive isotopes. The electron transfer field now includes many other reactions in solution, both of an inorganic and organic nature, reactions at various interfaces, biological electron transfers, solar energy conversion, and other phenomena. Theory has helped link many of these areas, quantitatively or semiquantitatively, and has in turn led to predictions such as the "cross-relations" and a rather striking "inverted effect". Some of the ideas developed have been extended to group and other transfer reactions. Examples of the interaction between theory and experiment in these various areas will be given.

The unimolecular reaction field has also developed considerably from its beginnings in 1920 by being extended in recent years using laser excitation techniques, such as CH and OH overtone excitation, vibronic excitation, and infrared multiphoton absorption, and using laser detection methods, and in some cases time-resolved measurements. A variety of applications of unimolecular theory (RRKM) to these systems, in which the position of the transition state of a dissociation is determined by a variational method, have been made. Some examples of these applications will be given. The unimolecular studies have now branched out into other areas, such as intramolecular dynamics.

Experiments have provided a rich base of phenomena to be treated theoretically, and theory helped by interpreting or predicting experiments and in suggesting new relationships. ◇

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## The Professional Relations Column

By Myron S. Simon

The low level of unemployment in the chemical community may lead to a feeling that there is no unemployment problem, but the person who has just been laid off or "terminated" (horrible expressions, currently used as a euphemism for "fired") knows that there is a real and immediate problem. Statistics don't help the chemist who has been "let go". What aid does the ACS have to offer that person?

The first thing we can recommend is that the chemist get a copy of *Coping With Job Loss*, by the ACS Committee on Professional Relations. Copies are available at the Section office: Call Mrs. Piper at (800) 872-2054, or from outside of Massachusetts: (508) 456-8227. The booklet attempts to give the chemist an understanding of the consequences of job loss, emotional and practical, suggests means of seeking and receiving support and assistance, and provides methods for searching for a new job.

For unemployed members, free situation wanted ads are available both in the *NUCLEUS* and in *C&E News*. The *NUCLEUS* has a circulation of around 4500 and is seen by employers in eastern Massachusetts and New Hampshire, so it is an appropriate place to advertise for Section chemists who prefer staying in this area.

Also, unemployed chemists may defer their ACS dues, not a small matter when there is no current income.

The ACS provides the Professional Data Bank as a free service to unemployed members. The chemist fills out a resumé form, when the ACS gets inquiries from employers it sends them all the resúmes that satisfy the job description. Call the ACS for information (800-227-5558, press 4 after the message stops)

At national meetings the National Clearing House allows unemployed members an opportunity to be interviewed by many employers. This is also a free service and, in addition,

unemployed chemists may register for free at the meeting. The next national meeting will be right here in Boston in April.

The ACS subscribes to a clipping service of help-wanted ads for chemists. This compilation is on a weekly basis for industrial jobs and monthly for academic positions. The Northeastern Section office receives copies on a regular basis. This service is currently being reviewed and may change in the future.

As companies retrench and take the shortsighted view that the quarterly financial news will look better if research and development costs are cut, more capable and productive chemists will suffer from such mismanagement. The Society and this Section will do all that can be done to help the chemist cope with loss of job. ♦

## Planning Committee Seeks Input

The newly formed Long Range Planning Committee of the Northeastern Section has been charged with developing a long range plan of goals and objectives for the section. The mission of the ACS has been formulated in a document called "Target 2000: A Commitment for the Future" which was developed at the national level and was published in the November 1986 *Nucleus*. Our local committee is now assessing current section activities within the framework of this document. It is possible that the focus of some local committees may have to be redirected and that new activities may have to be started in order to better serve our membership in the coming decade.

*continued on page 12*



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Wednesday, March 14, 8:00 PM  
*Sequence-Specific Recognition of  
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Thursday, March 15, 4:00 PM  
*Design and Chemical Synthesis of  
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# 1990 NESACS Committees

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### Awards

\*William Foye; Phyllis Brauner; Arno Heyn

### Board of Publications

\*Catherine Costello; Michael Strem; Joseph Lima

### Budget

\*James Piper; Joseph Billo; Charles Kolb; John Neumeyer; Michael Strem

### Chemistry Education

**University:** \*Dennis Sardella

Norris Summer Scholars: Cynthia McGowan; Und. Res. Sympos.: Emily Dudek; Stud. Affil.: Doris Lewis; Project SEED: Dennis Sardella

**High School:** \*Dorothy Bagley; Ashdown Exam.: Steve Lantos; Olympiad Exam.: Josephine Parlegreco; Aula Laudis Soc.: David Olney; Phyllis Brauner; Richard Coombs; Wallace Gleekman; Lyman C. Newell Grants: Laura Hallowell.

**Elementary:** \*Connie Senior

### Constitution and Bylaws

\*Arno Heyn; Esther Hopkins; Truman Light

### Hospitality

\*Leisa Corbett, Marie Potts (Co-chairs); Mary Burgess

### Membership

\*Iclal Hartman; Mary Burgess

### Nominating

\*Michael Strem, (four more to be elected-two in April, two in May)

### Professional Relations

\*Myron Simon; Mary Burgess; Michaeline Chen; Adrienne Dey; Esther Hopkins; Janet Perkins; Michael Strem

### Programs

\*Charles Kolb

### Public Relations

\*Katie Stygall; Phyllis Brauner; Thomas Greenbowe; Michael Strem

## Special Committees

### Continuing Education

\*Alfred Viola

### Long Range Planning

\*Adrienne Dey; Phyllis Brauner; Thomas Gilbert; Charles Kolb; Peter Meltzer; Arthur Obermayer

### Public Service

\*Patricia Samuel; Phyllis Brauner; Bette Bridges; Esther Hopkins; George Martin; Michael Strem; Carolyn Spodick; Katie Stygall; Valerie Wilcox

### Safety

\*James Kaufman, Frank Wagner (co-chairs)

### Secondary School Award

\*Irwin Taub; Carolyn Spodick; Wallace Gleekman; Ronald Harris; Harry Stubbs

### Speakers Bureau

\*Mary Ann Solstad

### Archivist

\*Esther Garber

continued on page 9

## 1990 NESACS Committees

continued from page 8

### NERM 23 (1993)

\*Thomas Gilbert

### Summerthing

\*Michaeline Chen; Catherine Byrne; Emily McHugh; Janet Perkins; George Thomas

### Retired Chemists Group

\*Ernest Becker

### Richards Medal

Norman Lichtin; Angelo Lamola; Fred Greene; Dudley Herschbach; Edwin Chandross; Albert Cotton; †Allen Bard

### Norris Award

Mary Jane Schultz; James Hendrickson; Robert O'Malley; David Haines; (also two to be elected by other members); †Joseph Lagowski

### Esselen Award

William Foye; Truman Light; Arthur Obermayer; Myron Simon; (also two to be appointed); †Michael Heylin

### 1990 National Meeting

Joseph Billo and 17 Section members

\* Committee or Subcommittee Chairman; †Ex-officio member

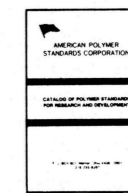
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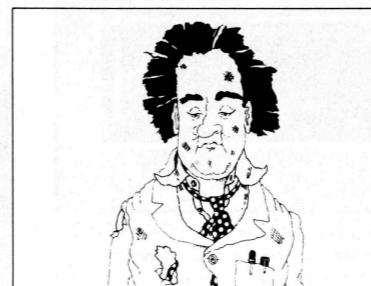
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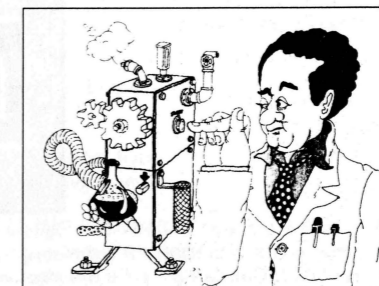


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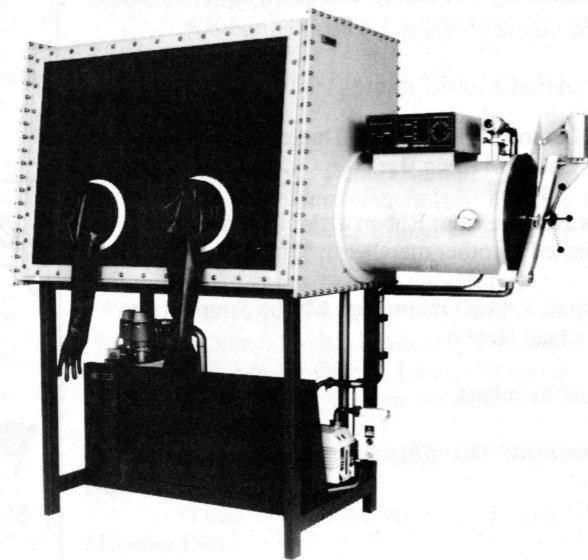
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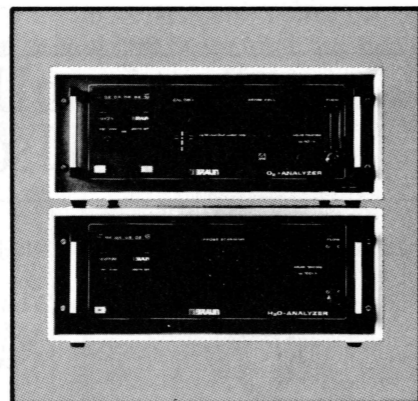
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## Historical Notes

by Edward R. Atkinson, Amherst, MA.

When John Strong (The NUCLEUS 1989, 67(6), 9) came to the California Institute of Technology in 1930 he found a world-famous faculty that had been assembled since 1915, when George E. Hale began transforming the Throop Polytechnical College into Cal Tech, aided by his fellow M.I.T. alumnus, Arthur Amos Noyes. Robert Milliken was president and T.H. Morgan, Max Mason, Linus Pauling, Noyes, and on occasion, Albert Einstein, were among the prestigious faculty. Last, alphabetically, was *Fritz Zwicky*, the subject of this note.

Zwicky was a native of Bulgaria, born February 14, 1898. By the time he received the B.S. (1920) and Ph.D. in physics (1922) from the Eidgenössische Technische Hochschule in Zurich he had become a Swiss citizen and mountain climber of some repute

and had acquired a Schweizerdeutsch accent that he would carry to the grave. He came to Cal Tech in 1925 as an international research fellow of the Rockefeller Foundation and rose through the professorial ranks until becoming emeritus in 1972. He concurrently served on the staffs of the Mt. Wilson and Palomar observatories and as director of research (1943-1949) and consultant (1949-1961) at Aerojet Engineering in Azusa, CA. He became an authority on the physics of crystals, liquids and gases, and on jet propulsion. He was the inventor of aeropulse, hypopulse, hydroturbojet, monopropellants and coruscatives. In the early 1930's he weighed galaxies by special methods and found that the mass so observed was only one-tenth that calculated by orbital mechanics. This observation led to

speculation about hidden mass in the universe, a problem not yet solved. He developed what became known among the problem-solving fraternity as "Zwicky's Morphological Research Method," an orderly way of looking at things: Problems were formulated and analyzed, then all valid solutions were synthesized and judged. In Strong's recent book: *Procedures in Applied Optics*; Dekker, New York, 1988, a chapter is devoted to Zwicky's method. For the many contributions listed above and for his other contributions to cosmology and the philosophy of science, Zwicky was awarded the Presidential Medal of Freedom by Pres. Harry Truman in 1948 and the Gold Medal of the Royal Astronomical Society in 1972.

(to be continued in a coming issue)

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## Planning Committee

continued from page 7

Any member who may have some suggestions should contact Dr. Adrienne S. Dey, Chair, at 449-9204. All members of the committee will greatly appreciate constructive input from the membership. ◇

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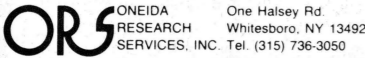
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## Laboratory Safety Symposium

A report on a symposium on "Successful Local Section Safety Programming" held at the Fall 1988 ACS meeting was issued recently by its Director, James Kaufman of our Section.

The report of the symposium, which is available either from the NESACS office or from Jim Kaufman at Curry College (617) 333-0500 x2220, summarizes the successful safety programs in place at ten of the larger Local Sections.

According to this report, the most frequently mentioned activity is that of conducting Laboratory Safety Workshops for high school teachers, or in a few cases also for college instructors. A few of the sections conducted chemical safety symposia specifically tailored to the need of fire departments. Two of the sections sponsored an evening course on chemical safety at colleges. Other activities which were mentioned were those of providing speakers to schools or civic groups concerning chemical safety, making audiovisual materials concerning chemical safety available to teachers or civic groups, or providing a list of experienced chemists to be "on call" to police or fire departments in case of emergencies. The Philadelphia and Puget Sound Sections have been very active in providing advice and support for Chemical Household Cleanup Days. The Chicago Section has been very active in conducting safety inspections at local college and university laboratories. The Puget Sound Section has provided input into the revision of the state safety code.

Many of the Sections mentioned specifically that attending the Laboratory Safety Workshops given by Dr. Kaufman got them started on their safety programs. **The next Safety Workshop will be given April 26-28, 1990 at Curry College. Call the above number for info.** ◇

## Last Chance to Volunteer:

Spring 1990  
National ACS Meeting.

Members, Spouses, Friends: We still need lots of people to staff the Hospitality Center in the Hynes Convention Center. The Hospitality Center provides complimentary coffee for registrants, maps and brochures, and information on local restaurants, transportation, entertainment, etc. The Hospitality Center will be open between the hours of 9:00 AM - 5:00 PM; hours for volunteers are flexible. Contact Mary Burgess, Hospitality Chairperson, 617-923-5562.

Retired Members: Joan Wheeland, ACS Coordinator of Employment and Career Services, needs volunteers to assist in the operation of the Employment Clearing House at the National Meeting. Volunteers will assist in registering and scheduling applicants and employers, and are requested to provide approximately 20 hours of work. In return, volunteers will receive free meeting registration, lunch, and other amenities. To sign up, call 1-800-227-5558 press 4.

Students — a number of paid positions are still available for students to assist in various operations of the meeting, such as registration, audiovisual services, etc. Student personnel will be paid \$7.00/hr and will receive free meeting registration. Retired members can also be employed in these positions. Contact Student Personnel Chairperson Carolyn Spodick, 617-738-2181 or Doris Lewis, 617-573-8253.

NESACS and several area colleges and universities will host a social hour on Wednesday April 25 at 6:00 PM (location to be published later in *C&E News* and the *NUCLEUS*. Any area chemistry departments not yet contacted that would like to be included in the social hour, contact Joe Billo at 617-552-3619. ◇

## Board of Directors

Condensed Minutes, Meeting of December 14, 1989

by David M. Howell

**Chairman:** Dr. Strem exhibited the proclamation received from Speaker Kevarian honoring the Northeastern Section. (Reprinted in the February 1990 *NUCLEUS*).

**Secretary:** D. Howell reported that due to an error one too many councilors had been elected and one too few Alternate Councilors. W. Gleekman consented to remove himself from the list of elected Councilors and be an Alternate Councilor, instead.

**Treasurer:** The bank account of the Section is near zero. No bills can be paid until monies are received. There remains \$ 3000.00 to be received from the Trustees for the summer issue of the *NUCLEUS*, approved earlier.

**Trustees:** A. Obermeyer reported that a new format for financial reports by the Board of Trustees is being adopted which will make it easier to interpret. In order to allow current bills to be paid, it was MOVED and VOTED to transfer \$ 2,000 from the Income Trust Funds to the account of the Treasurer of the Section.

**Awards Committee:** W. Foye announced that a candidate for the Northeast Regional Teaching Award has been nominated. The selection of the recipient of the Esselen Award is in process. The Richards Medal Committee has concluded its business after selecting an awardee.

**Chairman-elect:** C. Kolb reported on the Chairman-Elect Conference.

**Board of Publications:** J. Vnenchak raised the question of a special April issue of the *NUCLEUS* on the occasion of the national ACS meeting in Boston. It was agreed to aim for a 24-page issue and have 5,000 extra copies printed, subject to a final decision by February 18, when advertising results for such an issue are known. Special articles of interest to visitors

to Boston will be featured: Restaurants, Museums, Transportation (i.e. how to use the T), History of the Section.

**Budget Committee:** J. Piper indicated that \$ 9,000 in contributions will be needed to balance the 1990 budget.

**Constitution and Bylaws:** A. Heyn stated that the several C&B amendments will be voted at the December Section meeting on this date. (Approved at the Section Meeting-Sec'y).

**Professional Relations:** The professional relations meeting of the section will be on October 18, 1990. This will be an extra meeting, a week after the regular October meeting.

**Public Relations:** M. Strem reported on the State House reception on November 1. It was MOVED and VOTED to pay only the contracted amount of \$1,965 to the "Good News" Public Relations firm, even though a higher bill had been received.

**1990 National Meeting:** J. Billo reported that the various programs were on schedule. Some booths for the exposition have been sold by the Section which will raise a little more than \$ 1,000 for the Section. After discussion, it was MOVED and VOTED to have a Social hour jointly with some of the area colleges (13-1). Dr. Gleekman is working on tickets for the Red Sox-California Angels game. It was agreed to go ahead with this if the national ACS approves. 500 tickets were recommended (unsold tickets are returnable for credit).

**Public Service:** The repeat performance of the forensic chemistry lecture has been completely filled. There will be two offerings of the holiday lecture. Many reservations have already been made.

**New Business:** P. Brauner urged that "Careers in Chemistry" booklets

should be distributed on a trial basis to selected schools.

**Summerthing:** J. Perkins announced tentative dates of Aug. 3-5, 1990 (one or more days) at Salve Regina College, Newport, RI. Members of the Rhode Island Section should be invited. (This location was chosen because that is where the first meeting of the ACS was held).

**Annual Meeting of the Board of Directors:** To be held January 11, 1990 at Boston College. ◇

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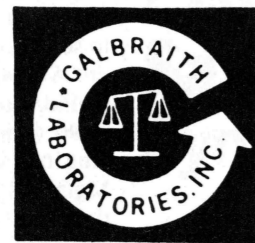
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## NERM

**20** Clarkson University  
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This Northeast Regional Meeting will be held June 26-29, 1990. Preregistration deadline is May 15. In addition to General Papers in all areas of chemistry there will be symposia on: Solid state science, H.T. superconductivity, Free radicals, Organic electrochemistry, Drug analysis, Modern liquid chromatography, Chemometrics, En-

vironmental chemistry and Chemical education. Computer workshops on applications in chemistry education follow on June 30 - July 3.

For information and registration forms, address: NERM 20, c/o. E. Bray, Dept. of Chemistry, Clarkson University, Potsdam, NY 13676.

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Minimum requirement is a B.S. in Chemistry or Biochemistry. M.S. or Ph.D. is preferred. Ideal candidates would have some sales experience. Excellent communication skills are required. 30-40% travel is expected.

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Southeastern Massachusetts University (617) 999-8246/8232  
University of Lowell (508) 934-3687  
University of New Hampshire (603) 862-1550

### Monday, March 5

Professor Julius Rebek, Jr. (MIT)  
"New Molecular Shapes for Recognition and Catalysis"  
Harvard University  
Mb-23 at 4:15 pm

### Tuesday, March 6

Dr. Igal Sziefel (Cornell University)  
"A New Mean-Field Theory for Dilute Polymer Solutions: Phase Diagram Conformational Behavior and Interfacial Properties"  
Massachusetts Institute of Technology  
Room 4-370 at 4:00 pm

### Wednesday, March 7

Dr. Bill D. Roebuck (Dartmouth College Medical School)  
"The Use of Selective Drugs and Food Additives to Protect Against Chemicals that Cause Liver Cancer"  
Southeastern Massachusetts University  
Science & Engineering Building Room 305 at 4:00 pm

### Thursday, March 8

Polymer Science/Plastic Engineering Seminar Series  
Professor C.C. Chu (Cornell University)  
"Degradation of Wound-Closure Biomaterials"  
University of Lowell  
Olney Hall 428 at 3:30 pm

### Monday, March 12

Professor Peter Dervan (Cal Tech)  
"Sequence-Specific Recognition of Double Helical DNA"  
Harvard University  
Mb-23 at 4:15 pm

Professor Richard Stratt (Brown University)  
"Electronic and Vibrational Structures of Liquids"  
Boston University  
Science Center Auditorium SCI 107 at 4:00 pm

Professor Michael Heinekey (Yale University)  
"Quantum Mechanical Exchange Processes in Transition Metal Polyhydrides"  
Brandeis University  
Gerstenzang 122 at 4:00 pm

### Tuesday, March 13

Dr. Udo Brinker (SUNY) Binghamton)  
"Carbene Rearrangements; Mechanism and Synthesis Aspects"  
Northeastern University  
Hurtig Hall Room 129 at 4:00 pm

Professor Ara Apkarian (University of California, Irvine)  
"Charge Transfer and Dissociation: Photodynamics in Condensed Media"  
Massachusetts Institute of Technology  
Room 4-370 at 4:00 pm

### Monday, March 19

Professor Muttaiya Sundaralingam (University of Wisconsin)  
"The Role of Water in Protein Folding"  
Boston University  
Science Center Auditorium SCI 107 at 4:00 pm

Professor K. Razi Naqvi (University of Trondheim, Norway)  
"Probing Protein Dynamics Through Photoselection: The Structure of Human Fibrinogen"  
Brandeis University  
Gerstenzang 122 at 4:00 pm

### Wednesday, March 21

Dr. Joel M. Goldberg (University of Vermont)  
"New Atomic Emission Sources for the Direct Elemental Analysis Refractory Solids"  
Southeastern Massachusetts University  
Science & Engineering Building Room 305 at 4:00 pm

### Monday, March 26

Professor Eric Block (SUNY Albany)  
"The Chemistry of Onions and Garlic"  
Boston University  
Science Center Auditorium SCI 107 at 4:00 pm

Dr. Fred N. Tebbe (E.I. duPont de Nemours and Co.)  
"Organometallic Synthons for High-Performance Materials"  
University of New Hampshire  
Parsons Hall Room L-103 at 4:00 pm

### Tuesday, March 27

Professor Klaus Mullen (Johannes Gutenberg University, Mainz, FRG)  
"Oligomers as Tailor-Made Electrophores and Chromophores"  
Brandeis University  
Gerstenzang 122 at 4:00 pm

### Wednesday, March 28

Dr. Joanne Stubbe (MIT)  
TBA  
Southeastern Massachusetts University  
Science & Engineering Building Room 305 at 4:00 pm

### Monday, April 2

Professor Andrew Myers (CalTech)  
"Enantioselective Synthesis of the Neocarzinostatin Chromophore Core. Mechanistic Studies of Natural and Synthetic Biradical Precursors"  
Harvard University  
Mb-23 at 4:15

Professor Cynthia Friend (Harvard University)  
"Structural and Mechanistic Surface Chemistry"  
Boston University  
Science Center Auditorium SCI 107 at 4:00 pm

### Notices for the Nucleus Calendar should be sent to:

Cynthia McGowan  
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