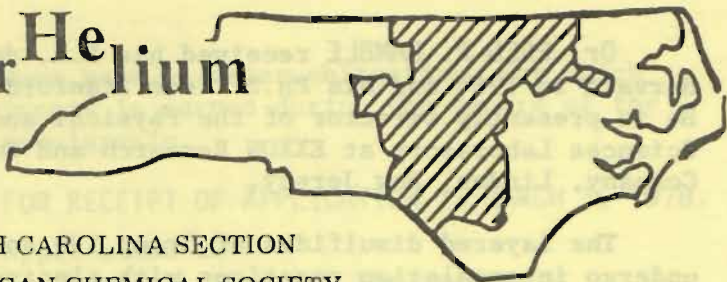


# Tar Helium



NORTH CAROLINA SECTION  
AMERICAN CHEMICAL SOCIETY

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Vol. 8, No. 5

Raleigh, N. C.

January 1978

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## SUPERCONDUCTING MOLECULAR INTERCALATION COMPLEXES AND ELECTROCHEMICAL ENERGY STORAGE

- Speaker: Dr. Fred R. Gamble  
EXXON Research and Engineering  
Linden, New Jersey
- Date: Tuesday, January 17, 1978
- Place: North Carolina State University  
Raleigh, North Carolina
- Time: 5:30 Happy Hour  
McKimmon Extension Education Center  
(Exit beltline at Western Blvd;  
located south of Western Blvd at  
Gorman St. on southwest side of  
NCSU campus; enter parking area  
from Gorman St.)
- 6:30 \*Dinner  
McKimmon Extension Education Center  
(\$5.50-full members; \$2.75-student  
& student affiliates)
- 8:00 Lecture  
McKimmon Extension Education Center

\* Please make reservations by Friday, January 13, 1978.  
Call: Sue Hester at 966-1566 in Chapel Hill, Bill  
Gutknecht at 684-2414 in Durham or Linda Hill at  
737-2548 in Raleigh.

Dr. FRED R. GAMBLE received his B.A. degree from Harvard in 1964 and his Ph.D. from Stanford in 1968. He is presently Director of the Physical and Material Sciences Laboratory at EXXON Research and Engineering Company, Linden, New Jersey.

The layered disulfides of Group IVb and Vb metals undergo intercalation reactions with electropositive metals and certain molecules. Their reaction with alkali metals is the basis of a new electrochemistry that provides high energy density couples operating at room temperature and suitable for the reversible storage of electrical energy. The best studied of this class is Li/TiS<sub>2</sub>. Reaction of the layered compounds with Lewis bases has provided the largest class of limited dimensional superconductors. Examples that will be discussed are TaS<sub>2</sub>(pyridine) $\frac{1}{2}$  and TaS<sub>2</sub>(NH<sub>3</sub>). Recently, it has been discovered that the more electropositive sandwich compounds also form intercalation compounds with these hosts. Two examples will be discussed: TaS<sub>2</sub>(CoCp<sub>2</sub>) $\frac{1}{4}$  and TaS<sub>2</sub>(CrCp<sub>2</sub>) $\frac{1}{4}$ . The latter compound is a superconductor below 3K with alternating superconducting and magnetic layers.

#### CENTENNIAL SCHOLARSHIP AWARD

The North Carolina Section of the ACS announces its third annual CENTENNIAL SCHOLARSHIP AWARD for the Summer of 1978. It carries a stipend of \$1000 (tax free).

#### Eligibility Requirements:

- (1) Membership or Associate Membership in the American Chemical Society.
- (2) Attendance at a Graduate or Professional School within the geographic boundaries of the North Carolina Section of the ACS and successful completion of at least one year of graduate or professional study toward an advanced degree at such an institution by the end of the academic year.

- (3) Must have no other obligations for which income is earned during the tenure of the scholarship.

DEADLINE FOR RECEIPT OF APPLICATION IS MARCH 1, 1978.

Send Application to:

Dr. David A. Yeowell, Chairman  
Scholarship Committee  
Burroughs Wellcome Co.  
3030 Cornwallis Road  
Research Triangle Park, N. C. 27709

Application must be accompanied with:

- (a) One copy of each of undergraduate and graduate (or professional school) transcripts (these need not be official--listing of courses and grades will be acceptable).
- (b) Two letters of recommendation: One from research director (thesis advisor) and one from another graduate professor.
- (c) No more than a 1000 word written summary, in the applicants own words, of their overall research project, which must be in a chemically related area, and an outline of the portion of the work planned for the period of the award (Summer 1978).

Note: The Scholarship will be awarded on the basis of excellence of academic record, superior performance as a teaching assistant (where applicable), and promise in research and quality of application. It will be given *primarily* on the basis of past performance, rather than the quality of the actual research proposed. The award is not subject to renewal. All applications will be acknowledged. The Scholarship will be awarded at the Meeting-in-Miniature on April 18, 1978. The recipient is expected to give a 5-minute presentation on this work at one of the fall meetings of the Section.

## DIGITAL ELECTRONICS and COMPUTER INTERFACING

DATES: Tuesday and Thursdays, February 14, 16, 21 & 23  
March 14, 16, 21 & 23

TIME: 5:15 to 6:30 p.m. PLACE: Drefus Auditorium (RTI)

### REGISTRATION

DEADLINE: February 7, 1978 TEXT: None. Handouts will be provided.

### COURSE

DESCRIPTION: It will be assumed that the students have had some exposure to modern instruments but have little knowledge of electronics beyond that normally presented in introductory college physics (Ohm's law, resistance networks, RC circuits, etc.). The course will be broadly organized into three sections:

Basic Building Blocks. The heart of digital circuits are electronic devices which are fabricated on a single multipin integrated circuit. The operation and electronic properties of the following devices will be discussed: logic gates, flip flops, monostable multivibrators, counters, shift registers, decoders and multiplexers. Emphasis will be upon the use of the devices in measurement/control devices. Frequent use will be made of manufacturer's literature describing the device.

Digital Measurement and Control. The utilization of digital devices for the measurement and control of voltage, time, motion and frequency will be discussed as examples of the use of digital technology in the chemical laboratory.

Transfer of Digital Data to Computers. The principles of parallel and serial data transfer will be presented as well as several of the schemes used for encoding digital information. Schematic diagrams of several simple handshake interfaces will be presented as examples of the principles utilized in interface design.

INSTRUCTORS: Dr. Charles B. Boss (Ph.D. 1977, Indiana University); Assistant Professor of Chemistry at N. C. State University; Area of Interest: flame spectroscopic methods of analysis.

Dr. Kenneth W. Hanck (Ph.D., 1969, University of Illinois); Associate Professor of Chemistry at N. C. State University; Area of Interest: electroanalytical chemistry.

Dr. William L. Switzer (Ph.D., 1970, University of Illinois); Assistant Professor of Chemistry at N. C. State University; Area of Interest: Raman spectroscopy, statistical handling of chemical data.

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Enclosed is a check payable to the North Carolina Section of the American Chemical Society as registration fee for DIGITAL ELECTRONICS and COMPUTER INTERFACING. A check must accompany the registration. Billing cannot be arranged. Non-members may contact the treasurer about joining the Society and receiving the members discount. If continuing education credit (through Meredith College) is desired check the blank and enclose \$2 extra.

\_\_\_\_\_ \$40 - ACS Member;

\_\_\_\_\_ \$50 - non ACS member

\_\_\_\_\_ \$2 fee for continuing education credits

NAME: \_\_\_\_\_ HIGHEST DEGREE: \_\_\_\_\_

BUSINESS ADDRESS: \_\_\_\_\_

PHONE \_\_\_\_\_

SEND TO: Dr. Forrest W. Getzen  
Treasurer, North Carolina Section ACS  
% Department of Chemistry  
North Carolina State University  
Raleigh, North Carolina 27607

## PROCEEDINGS OF THE EXECUTIVE COMMITTEE

The Executive Committee met on Tuesday, December 6, 1977 at North Carolina State University. The committee approved payment of one half of the expenses incurred by the Chairman-Elect on his recent trip to the Regional ACS meeting in Tampa, Florida. At this meeting Dr. Palmer proposed that the Regional meeting in 1984 be held in the Section.

In matters concerning the Education Committee, the Executive Committee approved an increase in the registration fee from \$40 to \$50 for non-ACS members and from \$30 to \$40 for members. The reasons cited were: 1) this year's deficit resulting from the summer scholarship program, which is supported entirely by the short course program, and 2) the need to increase the honorarium to those presenting the short courses. Regarding the latter, the Committee approved an increase in the honorarium from \$400 to \$500 for short course instructors. The Committee also approved awarding one \$1000 scholarship in 1978.

Other business included approving the printing of high school awards certificates and authorization to up-date wording of the certificate by the Awards Committee. Dr. Palmer also announced a forced canceling of the February program at the Morehead Planetarium. A new program has not yet been arranged.

## TWO SPRING SHORT COURSES PLANNED

The section plans to offer two short courses this spring. The first covers digital electronics and computer interfacing. A detailed course description and registration forms are enclosed in this issue of the TarHelium. The second course will cover practical aspects of high performance liquid chromatography (HPLC) and will include, if possible, some hands-on experience with HPLC. Further details will be given later, but the course will be offered on two consecutive days, a Friday and Saturday, in early April.

For the first time, continuing education units (CEUs) will be optionally available through Meredith College. An additional charge of \$2.00 is required by Meredith. The registration fee has been set at \$50 for non-members and \$40 for members. The membership discount can be obtained if application for membership accompanies registration. Contact either Dr. Forrest Getzen or Dr. Larry Bowen both at NCSU concerning membership. Participants are reminded that all profits from these short courses support the summer scholarship sponsored by the Section.

### AREA SEMINARS

UNC-CH, 11:00 a.m., Room 308 Venable Hall

\*Jan 25 Dr. Walter Gilbert, Harvard University  
"DNA Sequencing and Beyond"

Jan 31 Dr. Gilbert Stork, Columbia University  
"Postaglandins from Carbohydrates"

\*\*Feb 6 - Dr. Hans C. Andersen, Stanford  
Mar 3 University  
"Spectroscopy and Correlation Functions"

NCSU, 4:00 p.m., Room 124 Dabney Hall

Jan 18 Dr. Dietmar Seyferth, Massachusetts  
Institute of Technology  
"Hyper-reactive Organosilicon Compounds:  
Silacyclopropanes and Silacyclopropenes"

Jan 30 Dr. George Flynn, Columbia University  
"Lasers, Chemistry and Energy Transfer:  
a Sibling Rivalry"

\* Venable Lecture - 8:00 p.m. Room 207 Venable Hall

\*\* A series of 12 formal lectures is planned for Mondays, Wednesdays and Fridays at 11:00 a.m. For further information contact Dr. Howard Lemberg, 933-6095.

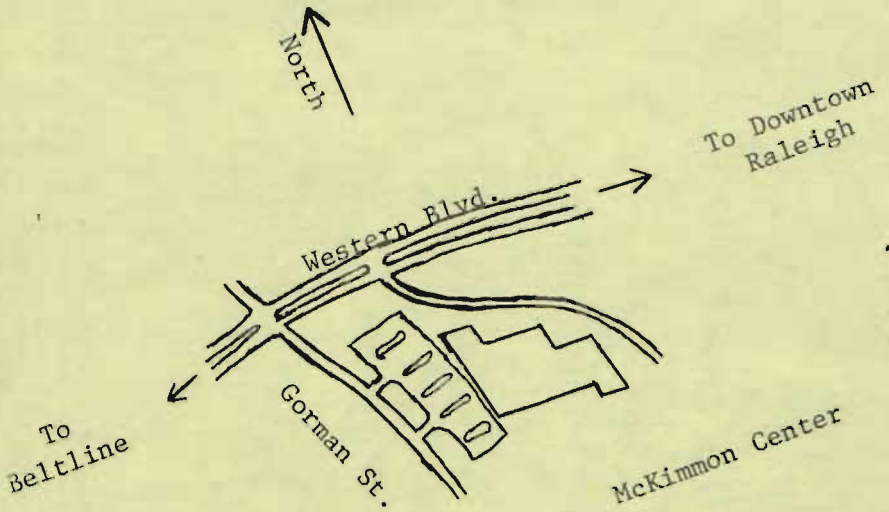
Duke, 3:30 p.m., Room 130 Gross Chemical Laboratory

- Jan 20 Dr. Robert V. Coleman, University of Virginia  
"Inelastic Electron Tunneling, a New Spectroscopic Technique"
- Jan 27 Dr. Sung-Ho Kim, Duke University  
"The X-ray Structure of Transfer RNA"
- Feb 1 Dr. Fraser Stoddart, University of Sheffield  
"To Enzyme Analogs by Lock and Key Chemistry with Crown Compounds"
- Feb 3 Dr. T. Ffrancon Williams, University of Tennessee  
"ESR Studies of Hypervalent Radicals"

H' H' H'

"A piece of spongy platinum placed in a jet of H will ignite it. This curious effect seems to be produced in the following way: the atoms of H and the O of the air are brought so closely together in its minute pores that they unite, and the heat thus generated sets fire to the gas."

Steeles Series in the Natural Sciences-Chemistry,  
p. 54, ca. 1887.





### EXECUTIVE COMMITTEE

Richard Palmer (*Duke*), Chairman  
Eric Wiechert (*Cutter*), Chairman-Elect  
Kathryn MacLeod (*EPA*), Secretary  
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