

**MAY MEETING**  
**Thursday, May 8, 1975**

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Bellingham

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MAY 13 1975

UNIVERSITY OF  
WASHINGTON

DR. JOSEPH R. LAKOWICZ

*"Quenching of Protein Fluorescence by Oxygen. Detection of  
Structural Fluctuations in Proteins on the Nanosecond Time Scale"*



UNIVERSITY OF  
WASHINGTON

MAY 14 1975

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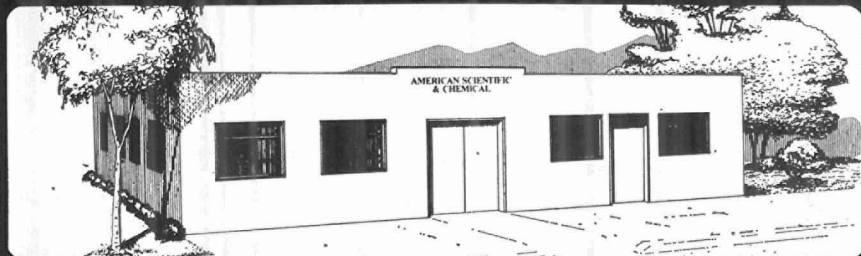
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*Bulletin of the Puget Sound Section of  
the American Chemical Society*

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Tacoma, Washington 98447

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# Joseph R. Lakowicz Is May Speaker

Dr. Joseph R. Lakowicz was born in Philadelphia, Pennsylvania in 1948. He received his B.S. degree in Chemistry from LaSalle College in Philadelphia in 1970 and his M.S. and Ph.D. degrees in Biochemistry from the University of Illinois in 1971 and 1973 respectively. His research advisor during his graduate training was Dr. Gregorio Weber, a leading authority on fluorescence spectroscopy and its applications to biological systems. From 1973 to 1974 Dr. Lakowicz was a NATO Postdoctoral Fellow at the Department of Biochemistry, Oxford University, Oxford, England. Upon returning to the U.S. he became a Research Associate at the Freshwater Biological Institute at the University of Minnesota and in February of this year he became an Assistant Professor of Biochemistry at the Institute. In addition to Dr. Lakowicz's NATO Fellowship, he was awarded a National Science Foundation Predoctoral Fellowship (1970-1973). He is a member of Kappa Mu Epsilon, the American Chemical Society, Phi Lambda Upsilon, ACS Division of Biological Chemistry, AAAS, Sigma Xi and the Biochemical Society (England). Dr. Lakowicz's research interests include, diffusional transport of small molecules, such as pesticides and the analogues, through biological membranes, equilibrium partitioning and exchange of these foreign molecules between membranes and serum lipoproteins, interactions among biological macromolecules and the segmental mobility of macromolecules.

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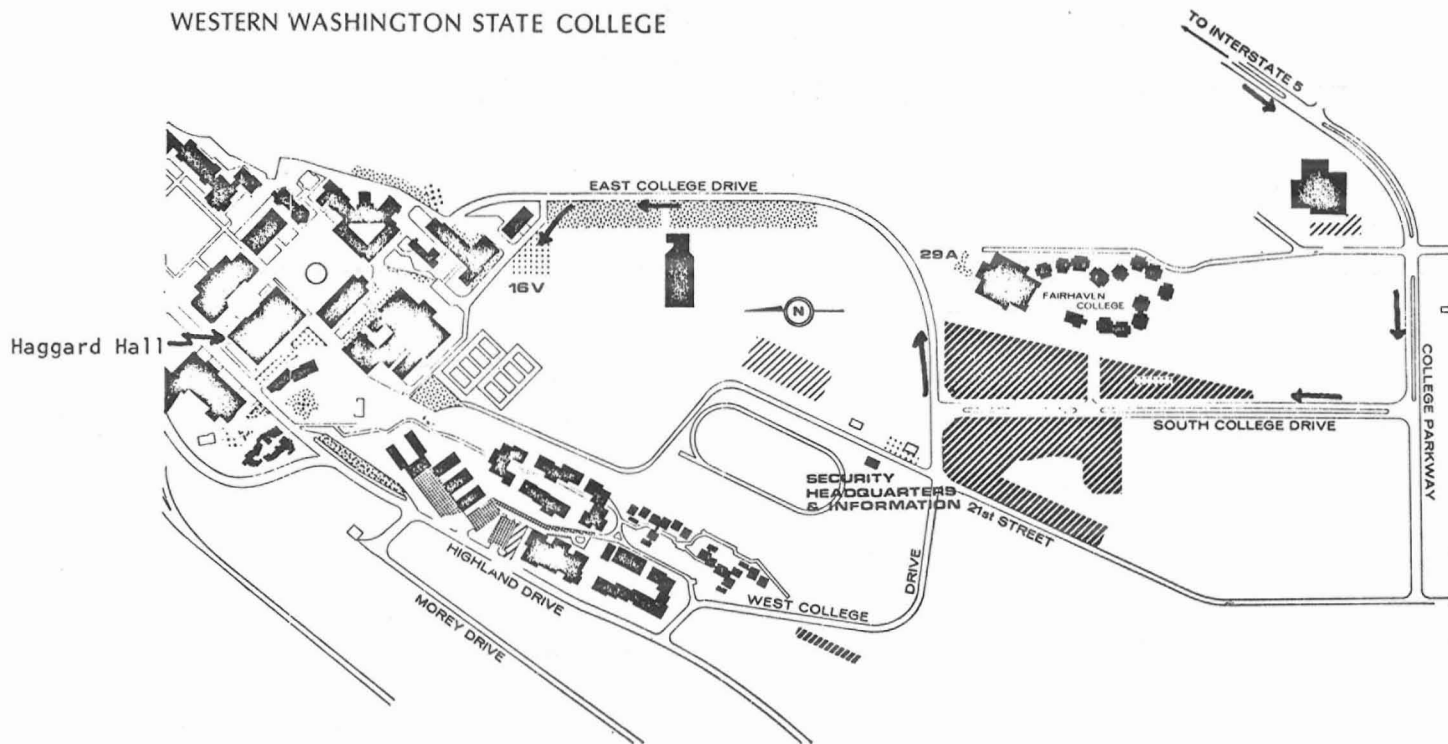
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# MAY MEETING

PUGET SOUND SECTION, AMERICAN CHEMICAL SOCIETY

SPEAKER: DR. JOSEPH R. LAKOWICZ

TOPIC: *"Quenching of Protein Fluorescence by Oxygen.  
Detection of Structural Fluctuations in Proteins  
on the Nanosecond Time Scale"*

DATE: THURSDAY, MAY 8, 1975

SOCIAL HOUR: 5:45 P.M. — No host bar

DINNER: 6:30 P.M.

PLACE: (Both Dinner and Social Hour)  
Black Angus Restaurant, Bellingham  
From the South, take the Samish Way Exit from  
I-5, cross over I-5 on Samish Way. Restaurant is  
on the right side one-half block beyond the over-  
pass.

MENU: Sirloin Steak

PRICE: \$5.50 (including tax and gratuity)

MEETING: 8:00 P.M.  
Haggard Hall of Science  
Lecture Hall 268 (main floor)  
Western Washington State College  
Bellingham, Washington

Dinner Reservations MUST BE MADE by TUESDAY, MAY 6, 1975. Reservations may be made by calling KIT GOODRICH, Seattle Central Community College, Telephone (206) 587-4075 (an operator will be on duty the entire day); in TACOMA AREA, DUANE SWANK (206) LE. 1-6900 ext. 304; and in the BELLINGHAM-VANCOUVER, B.S. AREA, JOE CROOK (206) 676-3071. When calling to make a reservation, please identify your purpose as an ACS Dinner Reservation.

THE MARCH MEETING at the Rainier Brewing Company was a great success. Thank you for attending this meeting.

# Quenching of Protein Fluorescence by Oxygen Detection of Structural Fluctuations in Proteins on Nanosecond Time Scale

Quenching of the tryptophan fluorescence of native proteins was studied using oxygen concentrations up to 0.13M corresponding to equilibration with oxygen at a pressure of 1500 psi. Measurements of absorption spectra and enzymic activities of protein solutions under these conditions reveal no significant perturbation of the protein structure. The oxygen quenching constant for a variety of proteins indicates that the apparent oxygen diffusion rate through the protein matrix is 20-50% of its diffusion rate in water. No tryptophan residues appear to be excluded from quenching, and no correlation of the fluorescence emission maxima with  $k^+*$

was found, indicating that the rapid oxygen diffusion is present in all regions of the protein, even those normally considered inaccessible to solvent. Energy transfer among tryptophans was excluded as a possible mechanism for the rapid quenching by studies using 306-nm excitation, where energy transfer is known to fail. The dynamic character of the observed quenching was given by the proportional decrease of the fluorescence lifetimes and yields measured under the same conditions. We concluded that proteins, in general, undergo rapid structural fluctuations on the nanosecond time scale which permit diffusion of oxygen.

Puget Sound Chemist  
Puget Sound Section, American Chemical Society  
A. Operating Statement  
December 31, 1974

INCOME:	
Advertising	\$1321.05
Subscriptions	
Miscellaneous	
TOTAL INCOME	<u>\$1321.05</u>

EXPENSES:	
Printing	\$1774.23
Administration (Mailing Fee)	30.00
Mailing, Postage	758.81
TOTAL EXPENSES:	<u>\$2563.04</u>

B. Balance Sheet  
December 31, 1974

ASSETS:	
Bank Account	\$178.21
Accounts Receivable — Advertising	263.48
Accounts Receivable—P. S. Section	558.31
Total Assets	<u>\$1000.00</u>
LIABILITIES AND NET WORTH	
Accounts Payable	\$0.00
Net Worth	1000.00
TOTAL	<u>\$1000.00</u>

Budgetary Trends:			
Year	Income	Expenses	Deficit
1966	\$1316.43	\$2149.28	\$ 832.85
1967	1399.51	2150.08	750.57
1968	1035.00	2349.83	1314.83
1969	1428.13	2575.35	1309.22
1970	2815.69	3479.07	663.38
1971	1526.77	2260.47	733.70
1972	1557.41	2416.73	859.32
1973	1531.40	2558.42	1027.02
1974	1321.05	2563.04	1241.99

American Chemical Society  
Northwest Regional Meeting Fund  
STATEMENT OF ASSETS  
December 31, 1974

ASSETS:	
Balance—January 1, 1974	\$3226.51
Net Revenue—December 31, 1974	1469.86
TOTAL	<u>\$4699.37</u>
Acct. drawn by Dr. Art. Mori (Hawaii)	1000.00
Net Deposited Assets (Dec. 1974)	<u>\$3699.37</u>

PUGET SOUND SECTION  
American Chemical Society  
Proposed Budget  
January, 1975

INCOME:	
Annual Allotment—Membership	\$3587.00
Travel Allotment	300.00
Commissions, New Members	30.00
Interest	700.00
Contributions	0.00
Dues, Local	300.00
Short Course	0.00
Meetings, Monthly	0.00
TOTAL INCOME	<u>\$4917.00</u>

EXPENSES:	
Puget Sound Chemist—Monthly Issue	\$1500.00
Directory	800.00
Administration and Committees	
Travel, Officers and Councilors	\$1000.00
Office Expenses	100.00
Bond, Treasurer (Pd. 2nd of 3 years)	0.00
Committees	
Education	\$100.00
Short Course	0.00
H.S. Teacher Speakers (Ed. Ramey)	100.00
H.S. Teacher Award	30.00
Student Affiliates	20.00
Legislation	100.00
Professional Relations and Status	10.00
Public Relations—Centennial	50.00
Awards	
H.S. Teacher	\$150.00
Pauling Award (Oregon)	300.00
(Seattle)	500.00
Affiliate Award	35.00
Recognition Awards	10.00
Program	
Speakers—Meetings	\$500.00
Pauling Symposium	500.00
Refreshments	150.00
TOTAL EXPENSES	<u>\$5955.00</u>

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## Why YOU Should Join the DPR

The Division of Professional Relations is the only Division for ACS members interested in the chemist as well as in chemistry. Join us and get in on the action!

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All Division members receive the **PROFESSIONAL RELATIONS BULLETIN**. Past issues have carried articles on Legal Rights of Professionals, Why Chemists Should Belong to Unions, Images and Incomes, Advice for Legislative Interactors, etc. Anyone who joins the Division NOW receives **PROFESSIONAL RELATIONS BULLETIN** No. 8 which carries the text of the Symposium on Scientists and the Legislature which was given at the Atlantic City Meeting in September, 1974. The small annual Di-

## Centennial Exhibit Committee

The final design for the Exhibit will probably be ready by June or July and building contracts will be let at that time, Committee Chairperson Dr. Glenn E. Uilyot reported. The Association of Science and Technology Centers will schedule the showings and also coordinate Exhibit publicity, he said. A first for a scientific organization, the Exhibit will tour all parts of the United States during the three-to-five years it is in use. Exhibit Committee members and other interested parties will hold a day-long meeting at ACS headquarters on March 19 with the designers, Chermayeff & Geismar Associates.

Dr. Uilyot announced that Dr. John H. Woodburn, educator and writer, has been engaged to author a series of booklets about Exhibit concepts and themes.

Two delegates noted that women may be offended by use of the word "man" in Exhibit module titles. Dr. Uilyot said alternatives will be considered and discussed with the designers.

He said it is hoped cooperative programs will be developed with Local Sections when the Exhibit is shown in their areas.

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# Executive Committee Meeting

MARCH 12, 1975

Attendees: J. Cook, E. Ramey, E. Gruger, P. Lepse, B. Steckler, C. Scott, D. Swank, H. Wasserman, S. Flajser, J. Macklin, A. Frank, W. Wasserman.

The meeting was called to order by Chairman Cook at 7:00 p.m.

Flajser presented the legislative councilor's report which was discussed by the committee. It was agreed that there was no current opportunity for significant action on legislation. Suggestions included (1) an education program to inform members about legislation affecting chemists; (2) a post-evaluation of the fate of bills; (3) a story in the **Chemist** with a plea for further volunteers to aid Flajser's project.

It was moved, seconded and adopted to approve the November 6 meeting minutes as corrected.

Adoption of the minutes of the December and January 15 meetings was moved, seconded and approved. No February meeting was held due to failure to reach a quorum.

Gruger moved that the section policy statement be amended to read "The Puget Sound Directory and Mailing lists shall not be sold or released to organizations or persons for non-ACS use." Seconded by Scott. Approved unanimously.

Correspondence was read. No action taken.

The Treasurer's report was read. Approval was moved, seconded, adopted.

The principle was raised that any net deficit in the social fund be charged to the category of refreshments.

The program committee report was made by Crook (for Johnson). It called for encouraging attendance at the March meeting.

Macklin reported on the status of the **Fluorescence and Phosphorescence Spectroscopy** audio short course scheduled for Seattle University, 501 Bannan Hall on April 25 and 26.

Swank reported that the "Directory Issue" of the **Chemist** was progressing.

Frank moved, Swank seconded that "Advertising rates for the **Chemist** be increased by 20% with new contracts." Approved unanimously. (Last previous increase in rates was 10% in 1958.)

A vote of thanks to Ramey for the well done **Resources in Science and Technology**. It was moved, seconded, adopted unanimously.

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Gruger reported that no Past Chairman certificates or high school teacher award scrolls were left. Purchase of new ones (from Clint Lee Bellevue) will be approximately \$7.00 each.

The price of student affiliate scrolls will be \$63 for 30 (\$2.15 each). It was moved, seconded, and approved unanimously that purchase of 30 scrolls be authorized.

Gruger reported receipt of a letter from John Meany informing him of the student affiliates regional meeting at 'S.P.C. on April 26.

Gruger moved, Swank seconded that "The Puget Sound Section Executive Committee be on record as not favoring duplication of Pauling Award Medals for any purpose other than the award itself. Adopted unanimously."

The By-laws Amendment will be in the next **Chemist** and will be voted on by the members at the Bellingham meeting in May.

Adjourned at 9:33 p.m.

Respectfully submitted  
William J. Wasserman  
Secretary



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## Ban On Chemical Warfare

Dr. Friedman expressed the desire of the Society "to discuss in greater detail the thoughts and concerns underlying the society's recommendation for unqualified U.S. ratification of the 1925 Geneva Protocol.

In previous testimony before a House of Representatives subcommittee, the Society made the following points and recommendations:

- \* Modern chemical warfare agents are weapons of indiscriminate mass destruction and a serious potential threat to civilians in war.
- \* Civilians with no practical protection, rather than trained military personnel, would be the more likely victims of surprise or terrorist chemical attack.
- \* The nature of chemical warfare has changed drastically since World War I; the battlefield can now encompass entire countries.
- \* Chemical weapons in general, and riot control agents in particular, would be least effective against the most sophisticated and well-prepared military personnel, such as

this nation's potential adversaries.

- \* An increased commitment to chemical disarmament rather than chemical deterrence is strongly in the interests of the United States.
- \* Binary chemical weapons production should be delayed: the simplicity and accessibility of the components of this proposed system make this weapon potentially available to many countries and terrorists. Also, such production would be expensive, potentially disadvantageous in encouraging proliferation, and may inhibit effective action on chemical disarmament.
- \* A continuous gradation in the toxicity of compounds that could be used as chemical warfare agents makes distinctions difficult to draw between lethal, incapacitating, or riot-control agents. Thus any exclusion of certain weapons would be hard to maintain, and an international ban on the use of chemical weapons, the Society concludes, must be simple and clear and must include all chemical weapons.

## Piret Joins ACS

Dr. Edgar L. Piret, retiring Counselor for Scientific and Technological Affairs at the U.S. Embassy in Paris, has been appointed personal assistant to the executive director of the American Chemical Society, Dr. Robert W. Cairns. A member of the Society since 1937, Dr. Piret will represent the executive director to outside organizations, both governmental and private, especially in the areas of scientific communications and education.

Dr. Piret has had a distinguished career in government, industry, and academe. He was appointed scientific attache to the Paris embassy in 1959, and in 1967 became the first scientist ever to be named Counselor in an American Embassy. His contributions have included negotiation and organization of cooperative programs in space, oceanography environment, medicine, astronomy, and other basic and applied areas of research.

Founded nearly 100 years ago, the American Chemical Society, now comprising more than 100,000 chemists and chemical engineers, is a world leader in fostering scientific communication through a system of primary journals and secondary abstracting and indexing systems, and through technical meetings covering a broad spectrum of chemical disciplines. The Society also works for the furtherance of chemical education in secondary schools, colleges, and universities, and provides a varied program of readily available continuing education.

Born in Winnipeg, Canada, in 1910, Dr. Piret became a U.S. citizen in 1922. He received the B.Ch.E. with distinction from the University of Minnesota in 1932; the doctorate in biochemistry and bacteriology from the University of Lyon, France in 1936; and the Ph.D. in chemical engineering from the University of Minnesota in 1937. He was assistant professor at Minnesota until 1943 when he joined the Minnesota Mining and Manufacturing Company (3M) as chief chemical engineer. Continuing as a consultant to 3M, Dr. Piret returned in 1945 to the University of Minnesota as professor of chemical engineering, a post he filled until 1959. Between 1951 and 1957, he also was a consultant to the U.S. Naval Research Laboratory.

Dr. Piret has been a Fulbright professor at the Universities of Nancy and

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Paris (1950-51), and a visiting professor at the Universities of Gothenburg and Delft (1945) and MIT and Harvard (1965-66). He accompanied U.S. State Department technical missions to the U.S.S.R. in 1957 and 1963. He has participated as official representative of the U.S. in many international scientific conferences.

Author of 60 technical papers and member of several scientific journal editorial boards, Dr. Piret is credited with patents and significant contributions to process such as a K combat ration component, aeration of trickling filters, the theory of continuous staged chemical reactors, and continuous fermentations.

Awarded the Croix de Chevalier, Legion of Honor (France) in 1957, Dr. Piret also holds awards for research and education from the Swedish Association of Engineers, the American Institute of Chemical Engineers, the French Academy, and the Universities of Paris and Liege.

Dr. Piret is a fellow of the American Institute of Chemical Engineers, the New York Academy of Sciences, and the American Association for the Advancement of Science. He is a member of the Cosmos Club, Washington,

## Information Please?

Computer-based chemical information systems in West Germany and the United States will be linked under an agreement just concluded between the American Chemical Society and Internationale Dokumentationsgesellschaft fuer Chemie m.b.H. (IDC).

The long-term agreement grants IDC the right to sue and the exclusive right to distribute in West Germany and West Berlin the publications, information services, and computer-readable information files produced by the American Chemical Society's Chemical Abstracts Service Division. IDC in turn will contribute a share of the cost of producing the Chemical Abstracts Service data base equal to the percentage of documents abstracted by CAS that originate in West Germany—presently about 7 percent.

Chemical Abstracts Service, located in Columbus, Ohio, gathers, abstracts, and indexes all of the world's new published information on chemical science and technology — more than 300,000 scientific articles, reports, and patents annually — and produces the weekly journal **Chemical Abstracts**, which is

used as a basic reference tool by scientists and engineers around the world.

Over the past decade CAS, with support from the National Science Foundation, has developed a comprehensive computer-based system for processing and storing chemical information, including a computer-searchable file of information on the structures of more than 3 million chemical compounds.

IDC, which was set up in 1967 in West Germany by a number of major European chemical companies to operate a centralized information system to serve the needs of industry, also has developed an extensive computer data base and search system for chemical information. With implementation of the new agreement, files produced by the CAS computer system will provide a substantial part of the data base for the German system.

IDC in addition is taking over the marketing and distribution of **Chemical Abstracts** and other Chemical Abstracts Service publications in West Germany from the West German Chemical Society (Gesellschaft Deutscher Chemiker), which has performed that function since 1970 under a cooperative agreement with the American Chemical Society.

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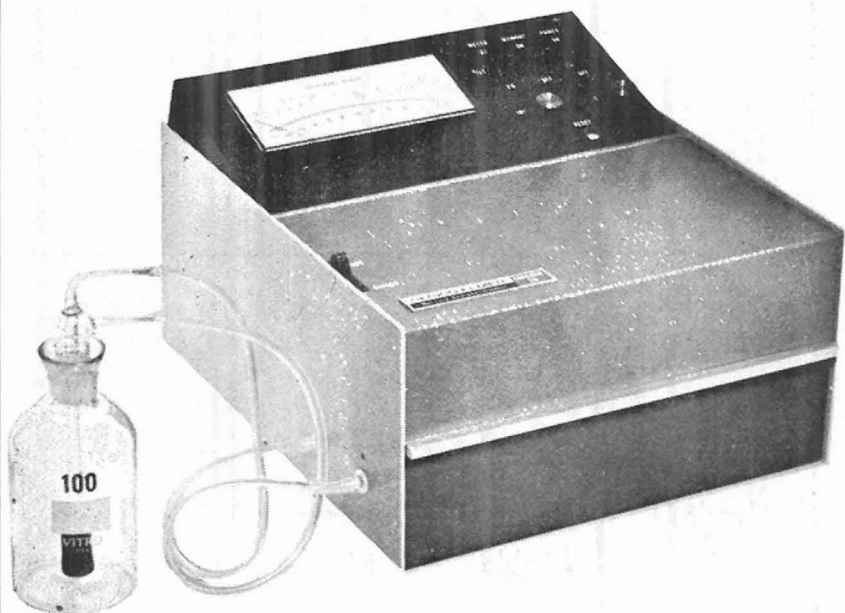
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